

Environmental Pollutants and Nutrition

Nuts and Seeds

Lisa Gaetke, Elizabeth Willett, Carolyn Hofe, Megan Finnie, University of Kentucky Superfund Research Program Community Outreach Core

It's no secret that good nutrition can have a positive impact on health. A healthy, balanced diet that includes whole grains, fruits, vegetables, legumes, nuts, and seeds can protect against chronic illnesses, such as type 2 diabetes, cardiovascular disease, and certain cancers.



Eating plant foods such as nuts and seeds makes your diet more nutritious and may help prevent chronic diseases, especially if you come into contact with pollutants in the environment. Plant foods contain nutritious compounds called phytonutrients. Research into these plant compounds is relatively new. Unlike vitamins and minerals, there is no Recommended Dietary Allowance (RDA) for phytonutrients.

A *nut* is defined as “a hard-shelled dry fruit or seed with a separable rind or shell and interior kernel.” A *seed* is defined as “the grain or ripened ovule of plants used for sowing.” Peanuts are actually a legume rather than a tree nut. Most commonly thought of as a snack or topping to a bagel or cracker, nuts and seeds can play a bigger part in the overall meal plan, and they offer the nutritional benefits to justify their inclusion.

Why are nuts and seeds considered a healthy part of my diet?

Nutritionally, nuts and seeds are low in saturated fat, yet high in fiber, vitamin E, magnesium, phytonutrients, and poly- and monounsaturated fats. Because they are of plant origin, nuts and seeds do not contain cholesterol. Unless salted, nuts and seeds are naturally low in sodium.

The University of Kentucky is a participant in the Superfund Research Program (SRP), which conducts ongoing research on the effects of pollutants and hazardous chemicals on the environment and on the body. Good nutrition is one of our best defenses for staying healthy, even in the presence of environmental pollutants. For more information, see *Hazardous Chemicals and Your Body* (IP-76 and IP-77) at <http://www.ca.uky.edu/agc/pubs/ip/ip76/ip76.pdf> and <http://www.ca.uky.edu/agc/pubs/ip/ip77/ip77.pdf>.



Vitamin E protects our immune system by acting as one of the body's most important antioxidants. Magnesium, a required mineral, is involved in many important bodily processes. Research has shown that not getting enough magnesium may lead to hypertension, diabetes, heart disease, and depression. Since many of the environmental pollutants can increase oxidative stress, adequate levels of vitamin E and magnesium, especially from eating whole foods, are important.

Don't nuts and seeds contain a lot of fat?

Although they yield the same amount of calories ounce for ounce, all fats are not created equal. Saturated and trans fats raise cholesterol levels. Monounsaturated and polyunsaturated fats are healthier. Monounsaturated fats are being studied because they may help lower cholesterol. Polyunsaturated fats are essential to health and must be provided in small amounts in the foods we eat.

Most fats in nuts and seeds are monounsaturated and polyunsaturated. Research has found nuts and seeds to be good for heart health and protective against the damage caused by oxidative stress. Some nuts, however, contain more saturated fats than other nuts and should be consumed in smaller

amounts (e.g. Brazil nuts, macadamia nuts, and cashews). And, yes, calories do count! Limiting intake to one serving per day is advised. Including nuts and seeds as part of a healthy diet may help the body defend itself against the harmful effects of environmental pollutants. (See Table 1.)

Table 1. Nutritional information for nuts and seeds.

	Serving size	Calories	Saturated					
			Fat (g)	Protein (g)	Fiber (g)	fatty acids (g)	MUFA*	PUFA**
Nuts								
Almonds	1 oz ≈ 20-23 whole nuts	160	14	6	3.5			
Hazelnuts	1 oz ≈ 21 nuts	180	17	4	2.7	1.3	12.9	
Pecans	1 oz ≈ 19 halves	195	20	2.6	2.7	1.8	11.6	6.1
Pine Nuts	1 oz ≈ 167 kernels	178	17.3	3.3	3.0	2.7	6.5	7.3
Pistachios	1 oz ≈ 49 nuts	160	13	5.75	2.9	1.5	6.6	3.8
Walnuts	1 oz. ≈ 14 halves	185	18.5	4.3	1.9	1.7	2.5	13.4
Brazil nuts	1 oz ≈ 6-7 nuts	185	18.8	4	2.1	4.3	7.0	5.8
Cashews	1 oz ≈ 16 nuts	160	12.4	5.2	0.9	2.4	7.3	2.4
Macadamia nuts	1 oz ≈ 10-12 nuts (raw)	205	21.5	2.2	2.4	3.4	16.7	0.4
Seeds								
Flaxseeds	1 tbsp (raw)	55	4.3	1.9	2.8			
Pumpkin seeds	1 oz	160	13.9	8.6	1.7	2.3	3.7	5.4
Sesame seeds	1 tbsp	50	4.5	1.6	1.1	2.6	6.8	7.2
Sunflower seeds	1 oz	175	16.1	4.9	3.3			

* MUFA = Monounsaturated fats

** PUFA = Polyunsaturated fats

Note: Nutrient data were collected and analyzed using Nutrition Data System for Research software version 2009, developed by the Nutrition Coordinating Center (NCC), University of Minnesota, Minneapolis, MN.

How many nuts and seeds should I eat?

According to the USDA MyPyramid (<http://www.mypyramid.gov>), a ½-ounce serving of nuts or seeds is equivalent to a 1-ounce serving of meat or poultry. This amount is equivalent to approximately 12 almonds, 24 pistachios, 7 walnut halves, or 1 level tablespoon of nut butter. Half an ounce of seeds or nuts is a good serving size for a snack. (Note: Nuts must be weighed on a food scale, not with a fluid-ounce cup measure.)

Health publications may recommend a 1.5-ounce serving of nuts for good overall health, but they do not suggest that you add additional calories to your current meal plan. Nuts and some seeds may be counted as the protein in a meal instead of meat, cheese, or eggs. If you choose to count nuts and seeds as the protein in your meal, a 1.5 ounce serving is equal to the recommended 3-ounce serving of meat, poultry, or fish. This substitution is in agreement with the Federal Drug Administration (FDA) recommendation of 1.5 ounces of nuts seeds per day as part of a heart-healthy diet.

What information is important when selecting and storing nuts and seeds?

To get the most out of your nuts and seeds, buy raw or plain products and store them properly (Table 2).

Raw vs. Roasted Nuts and Seeds

Raw, unroasted, unsalted nuts are the best choice for eating and cooking. Raw nuts and seeds have more nutrients because they are processed less. Unsalted nuts are naturally low in sodium. Raw nuts and seeds have a shorter shelf life, so they should be refrigerated or frozen for later use.

Commercial roasting of nuts and seeds is usually done in one of two ways: roasted or dry roasted. Roasting generally involves frying the nuts or seeds in oil and can add an additional 10 percent fat. Dry roasted nuts and seeds are heated without added oil but are often heavily salted. Raw unsalted nuts and seeds are healthier and often cost less.

Table 2. Selecting and storing nuts and seeds.

Item	Selection	Storage
Nuts		
All nuts	Avoid salted, oil-roasted nuts. Choose raw or plain varieties. If desired, roast at home in conventional oven.	Shelled nuts should be stored in an airtight container. Store up to 4 months in refrigerator or about 8 months in the freezer.
Seeds		
Flaxseed	Flaxseeds should be ground before eating to get the most nutrients from the seeds. To extend shelf-life, buy whole seeds and grind them at home in a coffee grinder. You may want to use a separate coffee grinder for flaxseeds and spices instead of your coffee grinder to prevent flavor contamination.	Store in an airtight container in the refrigerator. Whole seeds last the longest; grind when needed for adding to baked goods.
Poppy	Poppy seeds are sold whole and can be ground for added versatility. The seeds are very hard and require a special grinder or mortar and pestle. Roasting enhances flavor. When using for pastries, soak in water for 1-3 hours prior to grinding.	Store in airtight container in the refrigerator. Whole seeds last longest; grind when needed for adding to baked goods.
Pumpkin	Choose unsalted varieties from the grocery. In autumn, seeds from fresh pumpkins can be roasted at home.	Store in an airtight container in the refrigerator.
Sesame	Buy from grocery and toast at home for a nutty addition to breads, spinach, noodle dishes, and vegetable stir-fries.	Store in an airtight container in the refrigerator to prevent seeds from becoming rancid.



Nut and Seed Spread

- 1 cup walnut halves
- ½ cup sunflower kernels
- ½ cup sesame seeds
- 2 tsp honey
- 1 tsp oil
- 1 tsp water

Combine all nuts and seeds in a food processor or blender. Blend, gradually add honey, oil, and water until desired consistency. Store spread in refrigerator. Yield: approximately 1½ cups. One serving equals one level tablespoon.

Nutritional analysis performed with The Food Processor SQL, version 10.3.0, ESHA Research, 2008, Salem, OR.

Nutrition Facts			
Serving Size 1 Tablespoon (14g)			
Servings Per Container 20			
Amount Per Serving			
Calories 90	Calories from Fat 70		
% Daily Value*			
Total Fat 8g	12%		
Saturated Fat 1g	5%		
Trans Fat 0g			
Cholesterol 0mg	0%		
Sodium 0mg	0%		
Total Carbohydrate 2g	1%		
Dietary Fiber 1g	4%		
Sugars 1g			
Protein 3g			
Vitamin A 0%	* Vitamin C 0%		
Calcium 2%	* Iron 4%		
*Percent Daily Values are based on a 2,000 Calorie diet. Your daily values may be higher or lower depending on your calorie needs.			
	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g
Calories per gram:			
Fat	9	* Carbohydrate	4 * Protein 4

Serving suggestions

Add nuts and seeds to already familiar favorites.

- Chopped almonds, walnuts, or pecans to salads, breakfast cereal, or yogurt
- Cashews or peanuts to a stir fry recipe
- Pine nuts to pasta
- Ground walnuts to pancake batter
- Nuts or sunflower seeds to bread dough before baking
- Ground flaxseed in batters or breading for oven-baked fish or chicken
- Peanut or almond butters in stir fry recipes

Replace less nutritious choices with more healthful ones.

- Choose whole-grain crackers with added flaxseeds instead of less nutritious crackers.
- Replace salad croutons with nuts or seeds.

References

- American Diabetes Association. (2010). Standards of medical care in diabetes 2010. *Diabetes Care*, 33 Suppl 1, S1-61.
- Griel, A., & Kris-Etherton, P. (2006). Tree nuts and the lipid profile: A review of clinical studies. *Br J Nutr*, 96 Suppl 2, S68-78.
- National Heart Lung and Blood Institute. (2006). *Your Guide to Lowering your Blood Pressure with DASH*. Retrieved from <http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/index.htm>.
- Nut. In *Merriam-Webster Online*. Retrieved from <http://www.merriam-webster.com/>.
- Phung, O., Makanji, S., White, C., & Coleman, C. (2009). Almonds have a neutral effect on serum lipid profiles: a meta-analysis of randomized trials. *J Am Diet Assoc*, 109 (5), 865-73.
- Seed. In *Merriam-Webster Online*. Retrieved from <http://www.merriam-webster.com/>.
- United States Department of Agriculture. (2010). Agriculture Research Service. Retrieved from <http://www.ars.usda.gov/main/main.htm>.
- United States Department of Agriculture. (2010). MyPyramid.gov. Retrieved from <http://www.mypyramid.gov/>.
- United States Environmental Protection Agency. (2010). *Superfund*. Retrieved from <http://www.epa.gov/superfund/>.
- University of Kentucky Superfund Research Program. (2009). *Core D: Community Outreach Core*. Retrieved from <http://www.uky.edu/Research/Superfund/Outreach.html>.

This publication is made possible in part by grant number P42 ES007380 from the National Institute of Environmental Health Sciences, NIH. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of NIEHS, NIH.