

Home

Interpreting News  
on DietFrequently Asked  
Questions

Food Pyramids

Fats &amp; Cholesterol

Carbohydrates

Protein

Fiber

Fruit &amp; Vegetables

Calcium &amp; Milk

Alcohol

Vitamins

Healthy Weight

Exercise

Type 2 Diabetes

More Information

## Food Pyramids

### What Should You Really Eat?

More than a decade ago, the U.S. Department of Agriculture created a powerful and enduring icon - the Food Guide Pyramid. This simple illustration conveys in a flash what the USDA says are the elements of a healthy diet. The Pyramid is taught in schools, appears in countless media articles and brochures, and even shows up on cereal boxes and food labels.



Unfortunately, the information embodied in this pyramid doesn't point the way to healthy eating. Why not? Its blueprint was based on shaky scientific evidence, and it hasn't appreciably changed over the years to reflect major advances in our understanding of the connection between diet and health.

The USDA is now in the process of revising its pyramid. It is a golden opportunity to create a newer, healthier guide. The latest version of the [Dietary Guidelines for Americans](#), the document upon which the Pyramid is supposed to be based, represents a step forward in nutrition advice from the government. Whether or not the new Pyramid - or some other shape - embodies what we now know about healthy eating remains to be seen.

As an alternative to the USDA's flawed pyramid, faculty members in the Harvard School of Public Health built the Healthy Eating Pyramid. It resembles the USDA's in shape only. The Healthy Eating Pyramid takes into consideration, and puts into perspective, the wealth of research conducted during the last ten years that has reshaped the definition of healthy eating.

### The USDA Pyramid Brick by Brick

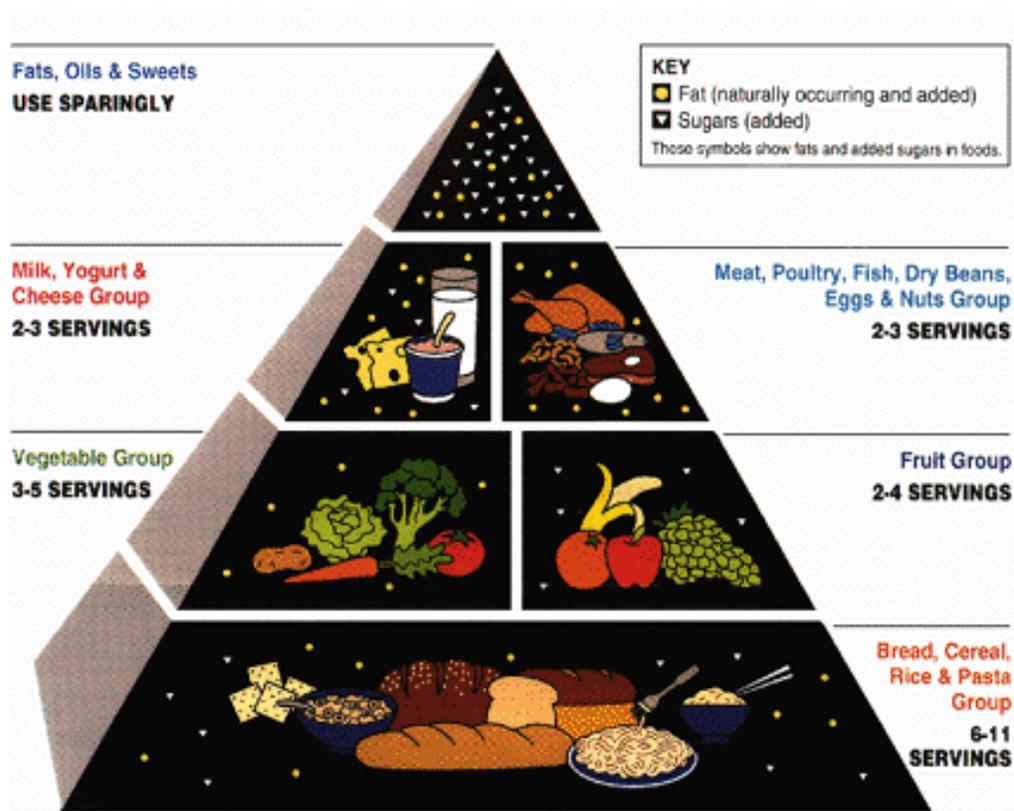
Distilling nutrition advice into a pyramid was a stroke of genius. The shape immediately suggests that some foods are good and should be eaten often, and that others aren't so good and should be eaten only occasionally. The layers represent major food groups that contribute to the total diet. The current and very much outdated USDA Food Guide Pyramid, which is based on older dietary guidelines, contains these elements:



Printer-friendly file

[Food Pyramids](#)

- **Bread, Cereal, Rice, and Pasta Group (6 to 11 servings):** Carbohydrates are a fundamental part of most diets. Part of the rationale for placing them in the base of the pyramid was that if people filled up on carbohydrates they would eat less fat. When the USDA pyramid was built in 1992, the main message for Americans was "fat is evil." But not all fats are bad and not all carbohydrates are good.
- **Vegetable (3 to 5 servings) and Fruit (2 to 4 servings) Group:** A diet rich in fruits and vegetables is one of the best ways to keep yourself healthy. If there's anything close to being "proved" in nutrition research, it's that eating lots of fruits and vegetables reduces the risk of heart disease, some types of cancer, and other chronic diseases. The U.S. government's "5 a day" campaign makes five servings of fruits and vegetables look like a goal when it should actually be a lower limit.
- **Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts Group (2 to 3 servings):** This is essentially the protein group. Everyone needs protein to keep tissues healthy and keep the body running smoothly. Some sources of protein are better than others, yet the USDA Food Guide Pyramid equates heart-healthy fish with bacon and bologna.
- **Milk, Yogurt, and Cheese Group (2 to 3 servings):** Healthy bones need calcium, which dairy products can supply. (They also need exercise and vitamin D.) But most people don't need the amount of calcium supplied by three servings of milk (1,000 milligrams) a day, and there's some question that dairy products are the best way to prevent osteoporosis, the bone-thinning condition that affects many older women and men.
- **Fats, Oils, and Sweets (Use Sparingly):** When the Food Guide Pyramid was built, policy makers wanted to send Americans a simple message for preventing heart disease: Eat less fat and you will have a better cholesterol level and a healthier heart. The fat phobia spawned by this message probably had little impact on heart disease. But it may have contributed to the current epidemics of obesity and diabetes as people replaced fats with fast-burning carbohydrates. The fat-is-bad message also keeps people from eating healthy fats - monounsaturated and polyunsaturated fats.



USDA and the US Department of Health and Human Services

## Pyramid Building

In the children's book *Who Built the Pyramid?*, (1) different people take credit for building the once-grand pyramid of Senwosret. King Senwosret, of course, claims the honor. But so does his architect, the quarry master, the stonecutters, slaves, and the boys who carried water to the workers.

The USDA Food Guide Pyramid also had many builders. Some are obvious - USDA scientists, nutrition experts, staff members, and consultants. Others aren't. Intense lobbying efforts from a variety of food industries also helped shape the pyramid.

In theory, the USDA pyramid should reflect the nutrition advice assembled in the [Dietary Guidelines for Americans](#). According to the USDA, the guidelines "provide authoritative advice for people two years and older about how good dietary habits can promote health and reduce risk for major chronic diseases."

This document, which by law must be revised every five years, aims to offer sound nutrition advice that corresponds to the latest scientific research. The panel assembled to create the guidelines usually generates 100 or so pages of dense nutrition-speak. This document is translated into a [reader friendly brochure](#) aimed at helping the average person choose a balanced and healthy diet. Of far greater importance, the Dietary Guidelines for Americans set the standards for all federal nutrition programs, including the school lunch program, and helps determine what food products Americans buy. In other words, the guidelines influence how billions of dollars are spent each year. So even minor changes can hurt or help a food

industry.

According to federal regulations, the panel that writes the dietary guidelines must include nutrition experts who are leaders in pediatrics, obesity, cardiovascular disease, and public health. Selecting the panelists is no easy task, and is subject to intense lobbying from organizations such as the National Dairy Council, United Fresh Fruit and Vegetable Association, Soft Drink Association, American Meat Institute, National Cattlemen's Beef Association, and Wheat Foods Council.<sup>(2)</sup>

## **Dietary Guidelines, 2005**

Released in early January, 2005, Dietary Guidelines for Americans 2005 continues to reflect the tense interplay of science and the powerful food industry. Several of the new recommendations represent important steps in the right direction:

- The new guidelines emphasize the importance of controlling weight, which was not adequately addressed in previous versions. And they continue to stress the importance of physical activity.
- The recommendation on dietary fats makes a clear break from the past, when all fats were considered bad. The guidelines now emphasize that intake of trans fats should be as low as possible and that saturated fat should be limited. There is no longer an artificially low cap on fat intake. The latest advice recommends getting between 20% and 35% of daily calories from fats and recognizes the potential health benefits of monounsaturated and polyunsaturated fats.
- Instead of emphasizing "complex carbohydrates," a term used in the past that has little biological meaning, the new guidelines urge Americans to limit sugar intake and they stress the benefits of whole grains.

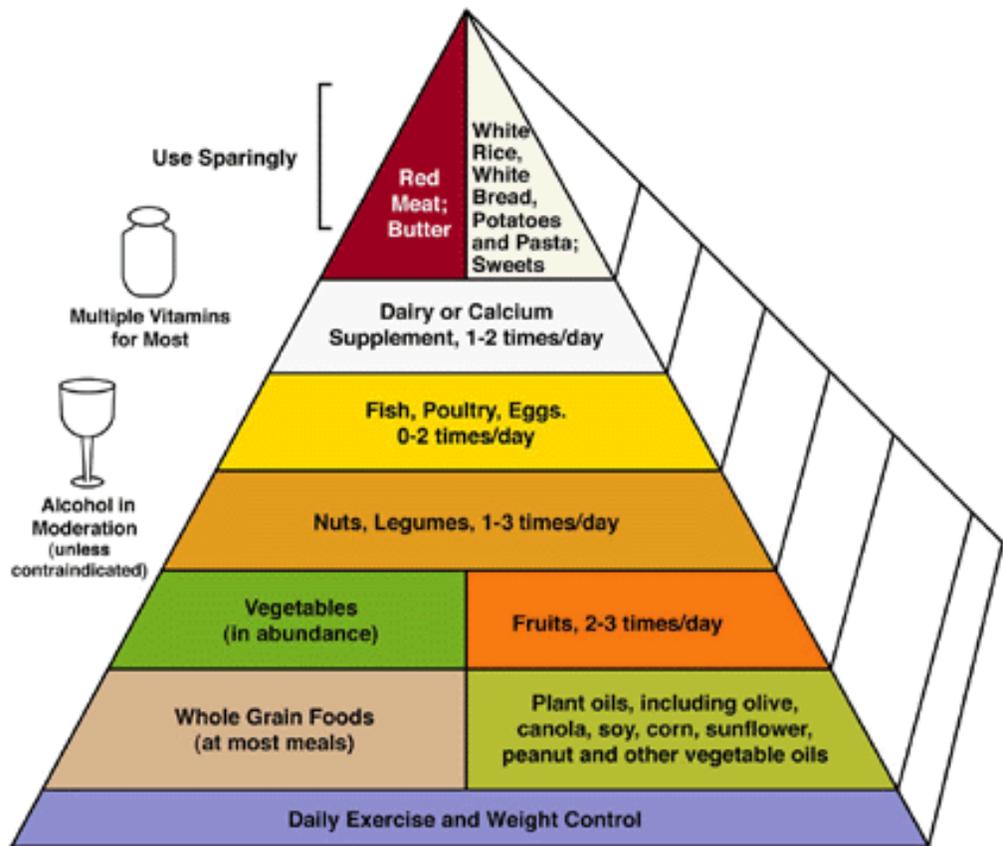
Others remain mired in the past:

- The guidelines suggest that it is fine to consume half of our grains as refined starch. That's a shame, since refined starches behave like sugar. They add empty calories, have adverse metabolic effects, and increase the risks of diabetes and heart disease.
- In terms of protein, the guidelines continue to lump together red meat, poultry, fish, and beans (including soy products). They ask us to judge these protein sources by their total fat content, "make choices that are lean, low-fat, or fat-free." This ignores the evidence that these foods have different types of fats. It also overlooks mounting evidence that replacing red meat with a combination of fish, poultry, beans, and nuts offers numerous health benefits.
- The recommendation to drink three glasses of low-fat milk or eat three servings of other dairy products per day to prevent osteoporosis is another step in the wrong direction. Of all the recommendations, this one represents the most radical change from current dietary patterns. Three glasses of low-fat milk add nearly 400 calories a day. This is a real issue for the millions of Americans who are trying to control their weight. What's more, millions of Americans are lactose intolerant, and even small amounts of milk or dairy

products give them stomachaches, gas, or other problems. This recommendation ignores the lack of evidence for a link between consumption of dairy products and prevention of osteoporosis. It also ignores the possible increases in risk of ovarian cancer and prostate cancer associated with dairy products.

## Building a Better Pyramid

# Healthy Eating Pyramid



From EAT, DRINK, AND BE HEALTHY by Walter C. Willett, MD  
copyright Simon & Schuster 2001.

If the only goal of the Food Guide Pyramid is to give us the best possible advice for healthy eating, then it should be grounded in the evidence and be independent of business.

Instead of waiting for this to happen, nutrition experts from the Harvard School of Public Health created the Healthy Eating Pyramid. It is based on the best available

scientific evidence about the links between diet and health. This new pyramid fixes fundamental flaws in the USDA pyramid and offers sound information to help people make better choices about what to eat.

The Healthy Eating Pyramid sits on a foundation of daily exercise and weight control. Why? These two related elements strongly influence your chances of staying healthy. They also affect what and how you eat and how your food affects you. The other bricks of the Healthy Eating Pyramid include:

- **Whole Grain Foods (at most meals).** The body needs carbohydrates mainly for energy. The best sources of carbohydrates are whole grains such as oatmeal, whole-wheat bread, and brown rice. They deliver the outer (bran) and inner (germ) layers along with energy-rich starch. The body can't digest whole grains as quickly as it can highly processed carbohydrates such as white flour. This keeps blood sugar and insulin levels from rising, then falling, too quickly. Better control of blood sugar and insulin can keep hunger at bay and may prevent the development of type 2 diabetes.
- **Plant Oils.** Surprised that the Healthy Eating Pyramid puts some fats near the base, indicating they are okay to eat? Although this recommendation seems to go against conventional wisdom, it's exactly in line with the evidence and with common eating habits. The average American gets one third or more of his or her daily calories from fats, so placing them near the foundation of the pyramid makes sense. Note, though, that it specifically mentions plant oils, not all types of fat. Good sources of healthy unsaturated fats include olive, canola, soy, corn, sunflower, peanut, and other vegetable oils, as well as fatty fish such as salmon. These healthy fats not only improve cholesterol levels (when eaten in place of highly processed carbohydrates) but can also protect the heart from sudden and potentially deadly rhythm problems.(3)
- **Vegetables (in abundance) and Fruits (2 to 3 times).** A diet rich in fruits and vegetables can decrease the chances of having a heart attack or stroke; protect against a variety of cancers; lower blood pressure; help you avoid the painful intestinal ailment called diverticulitis; guard against cataract and macular degeneration, the major cause of vision loss among people over age 65; and add variety to your diet and wake up your palate.
- **Fish, Poultry, and Eggs (0 to 2 times).** These are important sources of protein. A wealth of research suggests that eating fish can reduce the risk of heart disease. Chicken and turkey are also good sources of protein and can be low in saturated fat. Eggs, which have long been demonized because they contain fairly high levels of cholesterol, aren't as bad as they're cracked up to be. In fact, an egg is a much better breakfast than a doughnut cooked in an oil rich in trans fats or a bagel made from refined flour.
- **Nuts and Legumes (1 to 3 times).** Nuts and legumes are excellent sources of protein, fiber, vitamins, and minerals. Legumes include black beans, navy beans, garbanzos, and other beans that are usually sold dried. Many kinds of nuts contain healthy fats, and packages of some varieties (almonds, walnuts, pecans, peanuts, hazelnuts, and pistachios) can now even carry a label saying they're good for your heart.
- **Dairy or Calcium Supplement (1 to 2 times).** Building bone and keeping it

strong takes [calcium](#), vitamin D, exercise, and a whole lot more. Dairy products have traditionally been Americans' main source of calcium. But there are other healthy ways to get calcium than from milk and cheese, which can contain a lot of saturated fat. Three glasses of whole milk, for example, contains as much saturated fat as 13 strips of cooked bacon. If you enjoy dairy foods, try to stick with no-fat or low-fat products. If you don't like dairy products, calcium supplements offer an easy and inexpensive way to get your [daily calcium](#).

- **Red Meat and Butter (Use Sparingly):** These sit at the top of the Healthy Eating Pyramid because they contain lots of saturated fat. If you eat red meat every day, switching to fish or chicken several times a week can improve cholesterol levels. So can switching from butter to olive oil.
- **White Rice, White Bread, Potatoes, Pasta, and Sweets (Use Sparingly):** Why are these all-American staples at the top, rather than the bottom, of the Healthy Eating Pyramid? They can cause fast and furious increases in blood sugar that can lead to weight gain, diabetes, heart disease, and other chronic disorders. Whole-grain carbohydrates cause slower, steadier increases in blood sugar that don't overwhelm the body's ability to handle this much needed but potentially dangerous nutrient.
- **Multiple Vitamin:** A daily [multivitamin](#), multimineral supplement offers a kind of nutritional backup. While it can't in any way replace healthy eating, or make up for unhealthy eating, it can fill in the nutrient holes that may sometimes affect even the most careful eaters. You don't need an expensive name-brand or designer vitamin. A standard, store-brand, RDA-level one is fine. Look for one that meets the requirements of the USP (U.S. Pharmacopeia), an organization that sets standards for drugs and supplements.
- **Alcohol (in moderation):** Scores of studies suggest that having an alcoholic drink a day lowers the risk of heart disease. Moderation is clearly important, since alcohol has risks as well as benefits. For men, a good balance point is 1 to 2 drinks a day. For women, it's at most one drink a day.

## Other Alternatives

The Healthy Eating Pyramid summarizes the best dietary information available today. It isn't set in stone, though, because nutrition researchers will undoubtedly turn up new information in the years ahead. The Healthy Eating Pyramid will change to reflect important new evidence.

This isn't the only alternative to the USDA's Food Guide Pyramid. The Asian, Latin, Mediterranean, and vegetarian pyramids promoted by Oldways Preservation and Exchange Trust[[www.oldwayspt.org](http://www.oldwayspt.org)] are also good, evidence-based guides for healthy eating. The Healthy Eating Pyramid takes advantage of even more extensive research and offers a broader guide that is not based on a specific culture. The Healthy Eating Pyramid is described in greater detail in *Eat, Drink, and Be Healthy: The Harvard Medical School Guide to Healthy Eating*, published by Simon and Schuster (2001).

## Failing The Test

A few years ago, the USDA's Center for Nutrition Policy and Promotion created the Healthy Eating Index "to measure how well American diets conform to recommended healthy eating patterns."<sup>(4)</sup> This score sheet uses five elements from the longstanding USDA Food Guide Pyramid (number of daily servings of grains, vegetables, fruits, meat, and dairy products) and five from the 1995 Dietary Guidelines for Americans (total fat in the diet, percentage of calories from saturated fat, cholesterol intake, sodium intake, and variety of the diet). A score of 100 means following the federal recommendations to the letter while a score of 0 means totally ignoring them.

To see how well the principles embodied in the Healthy Eating Pyramid stacked up against the government's advice, Harvard School of Public Health researchers created an Alternate Healthy Eating Index with a scoring system similar to the USDA's index. They then used information about daily diets collected from more than 100,000 female nurses and male health professionals taking part in two long-term studies to complete both indexes.

Men who scored highest on the USDA's Healthy Eating Index (meaning their diets most closely followed federal recommendations) reduced their overall risk of developing heart disease, cancer, or other chronic disease by 11% over 8-12 years of follow-up compared to those who scored lowest. Women who most closely followed the government's recommendations were only 3% less likely to have developed a chronic disease.<sup>(5)</sup>

In comparison, scores on the Alternate Healthy Eating Index did appear to correlate with disease. Men with high scores (those whose diets most closely followed the guidelines in the Healthy Eating Pyramid) were 20% less likely to have developed a major chronic disease than those with low scores. Women with high scores lowered their overall risk by 11%. Men whose diets most closely followed the Healthy Eating Pyramid lowered their risk of cardiovascular disease by almost 40%; women with high scores lowered their risk by almost 30%.

"The current USDA dietary pyramid misses an enormous opportunity for improving the health of Americans," says Walter Willett, the Fredrick John Stare Professor of Epidemiology and Nutrition in the Departments of Nutrition and Epidemiology. "It's clear that we need to rebuild the pyramid from the ground up. Every American deserves it."

## References

1. Hooper M, Heighway-Bury R. Who Built the Pyramid? Cambridge, Mass.: Candlewick Press, 2001.
2. Abboud L. Expect a food fight as U.S. sets to revise diet guidelines. Wall Street Journal: August 8, 2003, B1

3. Leaf A, Kang JX, Xiao YF, Billman GE. Clinical prevention of sudden cardiac death by n-3 polyunsaturated fatty acids and mechanism of prevention of arrhythmias by n-3 fish oils. Circulation 2003; 107:2646-52.
4. The Healthy Eating Index. USDA Center for Nutrition Policy and Promotion. <http://warp.nal.usda.gov/fnic/HEI/hlthyeat.pdf> accessed on 13 December 1999.
5. McCullough ML, Feskanich D, Stampfer MJ, et al. Diet quality and major chronic disease risk in men and women: moving toward improved dietary guidance. Am J Clin Nutr 2002; 76:1261-71.

---

The aim of the Harvard School of Public Health Nutrition Source is to provide timely information on diet and nutrition for clinicians, allied health professionals, and the public. The contents of this Web site are not intended to offer personal medical advice, which should be obtained from a health-care provider. The information does not mention brand names, nor does it endorse any particular products.

©2004 President and Fellows of Harvard College.

HARVARD SCHOOL OF PUBLIC HEALTH

