

Can a vegetarian diet provide adequate protein?

LO 6 List the benefits and potential challenges of consuming a vegetarian diet.

Vegetarianism ⓘ is the practice of restricting the diet to food substances of plant origin, including vegetables, fruits, grains, and nuts. In a 2015 nationwide poll, 3.4% of all U.S. adults reported that they are vegetarian (never eat meat, poultry, or fish), and another 10% said that more than half of their meals are vegetarian.¹⁵ And in 2014 a national poll found that 4% of youth age 8 to 18 are vegetarians.¹⁶ Although precise statistics of vegetarianism among college students aren't available, moving away from home and taking responsibility for one's eating habits appears to influence many college students to try vegetarianism.

There Are Many Types of Vegetarian Diets

There are almost as many types of vegetarian diets as there are vegetarians. Some people who consider themselves vegetarians regularly eat poultry and fish. Others avoid the flesh of animals but consume eggs, milk, and cheese liberally. Still others strictly avoid all products of animal origin, including milk and eggs, and even by-products such as candies and puddings made with gelatin.

Table 6.3 ⓘ identifies the various types of vegetarian diets, ranging from the most inclusive to the most restrictive. Notice that, the more restrictive the diet, the more challenging it becomes to achieve an adequate protein intake.

Table 6.3 Terms and Definitions of a Vegetarian Diet

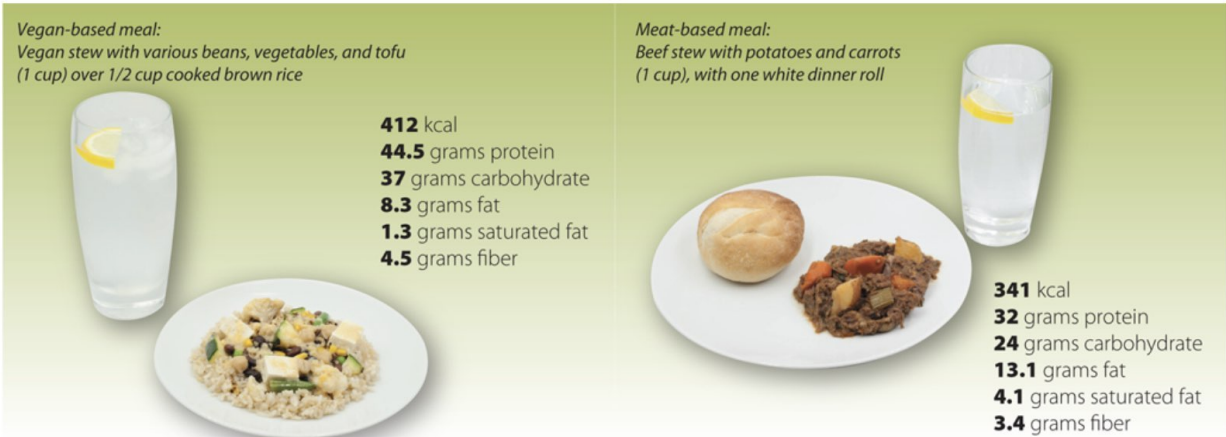
Type of Diet	Foods Consumed	Comments
Semivegetarian (also called flexitarian or plant-based diet)	Vegetables, grains, nuts, fruits, legumes; sometimes meat, seafood, poultry, eggs, and dairy products	Typically exclude or limit red meat; may also avoid other meats
Pescovegetarian	Similar to semivegetarian but excludes poultry	Pesco means “fish,” the only animal source of protein in this diet
Lacto-ovovegetarian	Vegetables, grains, nuts, fruits, legumes, dairy products (<i>lacto</i>), and eggs (<i>ovo</i>)	Excludes animal flesh and seafood
Lacto-vegetarian	Similar to lacto-ovovegetarian but excludes eggs	Relies on milk and cheese for animal sources of protein
Ovovegetarian	Vegetables, grains, nuts, fruits, legumes, and eggs	Excludes dairy, flesh, and seafood products
Vegan (also called strict vegetarian)	Only plant-based foods (vegetables, grains, nuts, seeds, fruits, legumes)	May not provide adequate vitamin B ₁₂ , zinc, iron, or calcium
Macrobiotic diet	Vegan-type diet; becomes progressively more strict until almost all foods are eliminated; at the extreme, only brown rice and small amounts of water or herbal tea	Taken to the extreme, can cause malnutrition and death
Fruitarian	Only raw or dried fruit, seeds, nuts, honey, and vegetable oil	Very restrictive diet; deficient in protein, calcium, zinc, iron, vitamin B ₁₂ , riboflavin, and other nutrients

One type of “vegetarian” diet receiving significant media attention recently is the **plant-based diet**^④: it consists mostly of plant foods, as well as eggs, dairy, and occasionally red meat, poultry, and/or fish. A plant-based diet is consistent with the healthy eating pattern recommended in the *2015–2020 Dietary Guidelines for Americans*.⁵

Vegan diets have also attracted a great deal of attention in recent years. People who are vegans who do not eat meat, fish, or poultry, or foods considered to be animal products or by-products such as eggs and dairy products.¹⁷ Some vegans also restrict the consumption of honey and the use of leather, fur, silk, wool, cosmetics, and soaps that have been derived from animal products. It is estimated that almost 15% of people who identify as vegetarians in the U.S. are vegans.¹⁵ Although a vegan diet is more restrictive than some forms of vegetarianism, if carefully planned with a variety of foods, including fortified foods, it can be as nutritionally sound as an eating plan that includes animal products. **Figure 6.15**[□] compares the macronutrient content of a vegan meal to that of a meat-based meal. As illustrated in this figure, a meal of vegan stew served with brown rice can provide more protein and fiber, and less fat and saturated fat, than a beef stew with potatoes and carrots served with a dinner roll.

Figure 6.15

A comparison of the energy and macronutrient content of a vegan meal and a meat-based meal. Note that the amount and quality of protein in a vegan meal is comparable to that of a meat-based meal when the vegan meal combines a variety of vegetables, whole grain, and legumes.

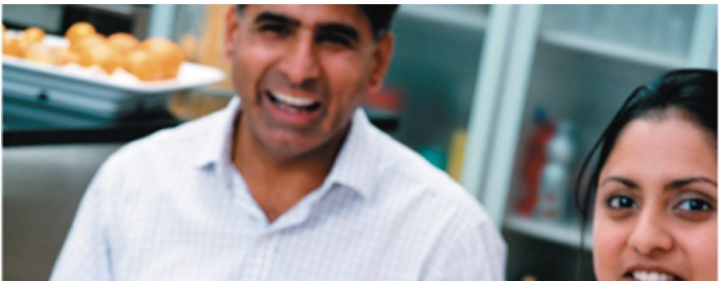


People Choose Vegetarianism for Many Different Reasons

When discussing vegetarianism, one of the most often asked questions is why people would make this food choice. The most common responses are included here.

Religious, Ethical, and Food-Safety Reasons

Some make the choice for religious or spiritual reasons. Several religions prohibit or restrict the consumption of animal flesh; however, generalizations can be misleading. For example, whereas certain sects within Hinduism forbid the consumption of meat, perusing the menu at any Indian restaurant will reveal that many other Hindus regularly consume small quantities of meat, poultry, and fish. Many Buddhists are vegetarians, as are some Christians, including Seventh-Day Adventists.





People who follow certain sects of Hinduism refrain from eating meat.

Many vegetarians are guided by their personal philosophy to choose vegetarianism. These people feel that it is morally and ethically wrong to consume animals and, in the case of veganism, any products from animals (such as dairy or egg products), usually because they view the practices in the modern animal industries as inhumane. If vegetarians do consume milk and eggs, they may choose to purchase them only from family farms where they feel animals are treated humanely.

There is also a great deal of concern about meat handling practices, because contaminated meat has occasionally made its way into our food supply. Many outbreaks of severe illness, sometimes resulting in permanent disability and even death, have been traced to hamburgers and other meat items served at fast-food restaurants and meats sold in markets and consumed at home.



(a)



(b)

Some people choose vegetarianism out of concern for the environmental effects of meat production. For example, livestock production (a) and aggressive deforestation that clears land for grazing (b) both contribute to increased greenhouse gas emissions.

Ecological Benefits

Many people choose vegetarianism because of their concerns about the effect of meat production on the global environment. The growing global population and rising standard of living has increased the demand for meat in developed and developing nations. As a result, meat production has evolved from small family farming operations to the larger system of agribusiness. Critics point to the environmental costs of agribusiness: massive uses of natural resources to support animals; release of methane and other greenhouse gases produced by the animals; pollution of water and soils; and deforestation for land use to support livestock. For an in-depth discussion of this complex and often emotionally charged topic, refer to [Chapter 13](#).

Health Benefits

Still others practice vegetarianism because of its health benefits. Research over several years has consistently shown that a varied and balanced vegetarian diet can reduce the risk for many chronic diseases. Its health benefits include the following:

- Reduced intake of fat and total energy, which reduces the risk for obesity. This may in turn lower a person's risk for type 2 diabetes.
- Lower blood pressure, which may be due to a higher intake of fruits and vegetables. However, people who eat vegetarian diets tend to be nonsmokers, to drink alcohol in moderation if at all, and to exercise regularly, all of which are also factors known to reduce blood pressure.
- Reduced risk for heart disease, which may be due to lower saturated fat intake and a higher consumption of dietary fiber and *antioxidant vitamins, minerals, and phytochemicals*. As noted earlier, antioxidants (discussed in detail in [Chapter 8](#)) help protect our cells. They are abundant in fruits and vegetables.
- Fewer digestive problems such as constipation and diverticular disease, perhaps due to the higher fiber content of vegetarian diets. Diverticular disease (discussed in [Chapter 4](#)) occurs when the wall of the large intestine pouches and becomes inflamed.
- Reduced risk for some cancers. Research shows that vegetarians may have lower rates of cancer, particularly colorectal cancer. Many components of a vegetarian diet could contribute to reducing cancer risks, including antioxidants, fiber, no intake of red meats and processed meats (which increase the risk for colorectal cancer), and lower consumption of *carcinogens* (cancer-causing agents) that are formed when cooking meat.¹⁸
- Reduced risk for kidney stones and gallstones. The lower protein contents of vegetarian diets, plus the higher intake of legumes and vegetable proteins such as soy, may be protective against these conditions.

A recent review of the evidence from three prospective cohort studies of Seventh-Day Adventists in North America confirmed that vegetarian diets conferred greater health benefits as highlighted above.¹⁹ In addition, this review stated that consuming a vegan-type eating pattern appeared to provide additional benefits of reduced obesity, hypertension, type 2 diabetes, and premature mortality from cardiovascular disease as compared to a lacto-ovovegetarian eating pattern.¹⁹

A Vegetarian Diet Can Present Some Challenges

Although a vegetarian diet can be healthful, it also presents some challenges. Limiting the consumption of flesh and dairy products introduces the potential for inadequate intakes of certain nutrients, especially for people consuming a vegan, macrobiotic, or fruitarian diet. Table 6.4 lists the nutrients that can be deficient in a vegan type of diet plan and describes good nonanimal sources that can provide these nutrients. Vegetarians who consume dairy and/or egg products obtain these nutrients more easily.

Table 6.4 **Nutrients of Concern in a Vegan Diet**

Nutrient	Functions	Nonmeat/Nondairy Food Sources
Vitamin B ₁₂	Assists with DNA synthesis; protection and growth of nerve fibers	Vitamin B ₁₂ –fortified cereals, yeast, soy products, and other meat analogs; vitamin B ₁₂ supplements
Vitamin D	Promotes bone growth	Vitamin D–fortified cereals, margarines, and soy products; adequate exposure to sunlight; supplementation may be necessary for those who do not get adequate exposure to sunlight
Riboflavin (vitamin B ₂)	Promotes release of energy; supports normal vision and skin health	Whole and enriched grains, green leafy vegetables, mushrooms, beans, nuts, and seeds
Iron	Assists with oxygen transport; involved in making amino acids and hormones	Whole-grain products, prune juice, dried fruits, beans, nuts, seeds, and leafy vegetables (such as spinach)
Calcium	Maintains bone health; assists with muscle contraction, blood pressure, and nerve transmission	Fortified soy milk and tofu, almonds, dry beans, leafy vegetables, calcium-fortified juices, and fortified breakfast cereals
Zinc	Assists with DNA and RNA synthesis, immune function, and growth	Whole-grain products, wheat germ, beans, nuts, and seeds

Research indicates that individuals with a history of disordered eating are more likely to switch to a vegetarian diet.²⁰ Instead of eating a healthful variety of nonanimal foods, people with disordered eating problems may use vegetarianism as an excuse to restrict many foods from their diet. To learn more about disordered eating, refer to [In Depth 11.5](#).



Vegetarians should eat two to three servings of beans, nuts, seeds, eggs, or meat substitutes (such as tofu) daily.

Can a vegetarian diet provide enough protein? In developed countries, where high-quality nonmeat protein sources are easy to obtain, the answer is yes. In fact, the Academy of Nutrition and Dietetics endorses an appropriately planned vegetarian diet as healthful, nutritionally adequate, and beneficial in reducing and preventing various diseases. Like any diet, however, a vegetarian diet should be *balanced* and *adequate*; thus, it is important for vegetarians to eat complementary proteins and obtain enough energy from other macronutrients to spare protein from being used as an energy source. Although the digestibility of a vegetarian diet is potentially lower than that of an animal-based diet, there is no separate protein recommendation for vegetarians who consume complementary plant proteins.²¹

THEO



"No way would I ever become a vegetarian! The only way to build up muscle is to eat meat. I read in a bodybuilding magazine about some guy who doesn't eat anything from animals, not even milk or eggs, and he did look pretty buff . . . but I don't buy it. They can do anything to pictures these days. Besides, after a game I just crave red meat. If I don't have it, I feel sort of like my batteries don't get recharged. It's just not natural for a competitive athlete to go without meat!"

What claims does Theo make here about the role of red meat in his diet? Do you think his claims are valid? Why or why not? Without trying to convert Theo to vegetarianism, what facts might you offer him about the nature of plant and animal proteins?

MyPlate Can Help You Plan a Vegetarian Diet

Although the USDA has not designed a version of MyPlate specifically for people following a vegetarian diet, healthy eating tips for vegetarians are available at MyPlate online (see the [Web Links](#) at the end of this chapter). For example, to meet their needs for protein and calcium, lacto-vegetarians can consume low-fat or nonfat dairy products. Vegans and ovovegetarians can consume calcium-fortified soy milk or one of the many protein bars fortified with calcium.



If you're interested in trying a vegetarian diet but don't know where to begin, check out the website of the Physicians Committee for Responsible Medicine at www.pcrm.org. Click on "Health and Nutrition," and then select "Vegetarian and Vegan Diets." Scroll down until you see the "Vegetarian Starter Kit."

Vegans need to consume vitamin B₁₂ either from fortified foods or supplements because this vitamin is found naturally only in foods derived from animals. They should also pay special attention to consuming foods high in vitamin D, riboflavin (B₂), and the minerals zinc and iron. Supplementation of these micronutrients may be necessary for some people if they do not consume adequate amounts in their diet.

Recap

Vegetarian diets vary from vegan diets, which include no animal-based foods or ingredients of any kind, to plant-based diets, which may include eggs, dairy, and even limited amounts of meat, poultry, and fish. A balanced vegetarian diet may reduce the risk for obesity, type 2 diabetes, hypertension and heart disease, digestive problems, some cancers, kidney stones, and gallstones. Whereas varied vegetarian diets can provide enough protein, vegans need to make sure they consume adequate plant sources of complementary proteins and foods fortified with vitamin B₁₂. They also need to ensure their diet provides adequate vitamin D, riboflavin, iron, calcium, and zinc.