HEALTH

Vegetarian Diets

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by J. Anderson and S. Prior [1]

Quick Facts...

Vegetarianism has become popular in the United States in the second half of this century.

Vegetarians can be divided into different categories depending on which animal foods are restricted in the diet.

People adopt vegetarian diets for many reasons, including health, ecology, economics, ethics and religion.

Vegetarianism is a widespread practice. In fact, a large part of the world's population subsists on vegetarian diets. In many areas, people are vegetarians because of inadequate income, lack of animal products, and religious and cultural beliefs. Vegetarianism has long been practiced in American society by a small proportion of the population. Only within the second half of this century has there been an increase in the popularity of vegetarianism in the United States (approximately 2.5 percent of the population).

The American Dietetic Association has stated that vegetarian diets are healthful and nutritionally adequate during all stages of the life cycle, when appropriately planned. It is important that vegetarians understand the principles necessary to practice safe and healthy vegetarianism.

Types of Vegetarian Diets

A vegetarian is a person who does not eat some or any foods of animal origin. Vegetarians have different dietary practices, but most can be categorized into one of the following groups:

- **Lacto-ovo-vegetarians** eat plant foods, milk, milk products and eggs, but avoid flesh foods (meat, poultry and fish).
- **Lacto-vegetarians** eat plant foods, milk and milk products, but avoid eggs and flesh foods.
- **Ovo-vegetarians** eat plant foods and eggs, but avoid milk, milk products and flesh foods.
- **Pesco/pollo-vegetarians** eat meats like seafood and chicken, but do not eat other meats, such as beef, lamb, and pork.
- **Total vegetarians,** also called **vegans**, eat plant foods only.

Why People Become Vegetarians

People adopt vegetarian diets for one or more of the following reasons:

Health

Many people believe they will be healthier if they are vegetarians. Vegetarian diets tend to be lower in saturated fat, cholesterol and sodium, and higher in fiber, magnesium, folate, potassium, and antioxidants than the typical American diet. There is considerable evidence to suggest positive relationships between a vegetarian diet and reduced risk for several chronic, degenerative diseases and conditions, including obesity, coronary artery disease, high blood pressure, diabetes and some types of cancer. Though there are positive health benefits of vegetarianism, it cannot prevent or cure disease. Vegetarians, like others, should seek necessary medical care.

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Ecology

Some people feel that one way to combat environ-mental degradation and world hunger is to eat lower on the food chain. These vegetarians feel the practice of growing food to feed animals is wasteful — that more people could be fed if crops were used to feed people rather than animals.

Economics

Most plant foods are less expensive than animal foods. The cost of meat may limit the amount people eat.

Ethics

Ethical reasons for vegetarianism include philosophies such as nonviolence and reverence for life. Some people are opposed to killing animals for food and abstain from eating meat, poultry and fish.

Religion

Some religious groups have traditionally been vegetarian. Several Indian religious groups include vegetarianism among their tenets of faith. In the United States, Seventh Day Adventists are the largest traditional group following vegetarianism and are lacto-ovo-vegetarians. Some vegetarians are members of new religious groups with diet-related taboos.

In planning vegetarian diets of any type, choose a variety of foods that ensure caloric intake meets energy needs.

Planning a Nutritious Vegetarian Diet

People on vegetarian diets generally receive adequate amounts of most nutrients. However, the following nutrients may be lacking. Vegetarians should make sure they get adequate amounts of these nutrients.

Energy

Energy is needed to sustain body processes and for physical activity. Energy in food is measured in calories. Calories are supplied by fat, carbohydrate and protein. Vegetarians tend to consume fewer calories and are thinner than meat-eaters. This is because plant foods are bulky and low in calories.

Most vegetarians eat enough food to meet their energy needs. Vegetarian children and adolescents will receive enough calories if their diets are well-planned. The less restricted the vegetarian diet, the easier it is to meet energy and nutrient needs.

Omega-3 Fatty Acids

An increasing body of research shows the many benefits of omega-3 fatty acids. These fats may reduce the risk for cardiovascular disease, improve cognitive function and vision, and act as an anti-inflammatory in the body. The primary sources of omega-3 fatty acids in the diet are fish, organ meats, and DHA-enriched foods, such as eggs. Based on these food sources, vegetarians may not get enough omega-3 fatty acids in their diet. However, vegetarians can choose from the increasing variety of DHA-enriched foods sold in the marketplace in order to boost their omega-3 fatty acid intake. Also, capsule supplements made from DHA-rich microalgae are available, but it is always important to consult a healthcare provider before taking a supplement.

The "Dietary Guidelines for Americans" *recommend a reduction in fat intake and an increased consumption of whole grains, vegetables and fruits. Well-planned vegetarian diets can effectively meet these guidelines and be a health-supporting dietary alternative.*

Protein

Protein is needed for growth and maintenance of body tissues. It also is necessary for enzymes, hormones, antibodies and milk production in women who are breastfeeding. Plant sources of protein can provide adequate amounts of essential and nonessential amino acids, if they are reasonably varied and caloric intake is sufficient to meet energy needs. Whole grains, legumes, vegetables, seeds and nuts all contain essential and nonessential amino acids. Textured

vegetable proteins and meat analogues, such as tofu and tempeh (usually made from soybeans and fortified with amino acids) are good protein sources.

Vitamins

Riboflavin helps the body break down carbohydrates, proteins and fats so they can be used for energy. It also is necessary for healthy skin, eyes and clear vision. The best sources are liver, milk products and red meats. When these foods are restricted or avoided, riboflavin must come from other sources, such as green leafy vegetables and fortified or enriched grains.

Vitamin B_{12} is needed for normal red blood cell formation and normal nerve function. The body needs only small amounts and can store it in large amounts. Therefore, a deficiency takes a long time to develop, maybe several years. Once a deficiency does develop, however, it results in irreversible nerve damage. Therefore, vegetarians need to pay special attention to this nutrient.

Cyanocobalamin, the human form of vitamin B_{12}, is available from nonanimal products such as fortified commercial breakfast cereals, fortified soy beverages, some brands of nutritional yeast, and other products.

A vegetarian who eats milk products daily will get enough vitamin B_{12}. Vegans, however, have little or no vitamin B_{12} in their diets. They must obtain the vitamin through regular use of a vitamin B_{12} source such as fortified soy milk or yeast, or a vitamin B_{12} supplement.

Vitamin D is required to absorb calcium from the digestive tract and to incorporate calcium into bones and teeth. Few foods contain large amounts of vitamin D. The best sources — fortified milk, egg yolks and liver — are all of animal origin. Therefore, vegetarians, especially vegans, may not get enough.

Another source of vitamin D is sunlight. The body makes vitamin D from sunlight on the skin. People regularly exposed to sunlight can get enough vitamin D without having any come from food. However, sun exposure can be limited by several factors, including dark skin, pollution and northern latitudes. If sun exposure is limited and there are no animal products in the diet, a vitamin D supplement is needed.

Minerals

Calcium is needed for strong bones and teeth, for normal blood clotting, and for normal muscle and nerve function. Most calcium in the American diet comes from milk and milk products. When these foods are avoided, calcium must come from other sources. Dark green leafy vegetables are the plant foods that provide the most calcium.

Certain plant components may inhibit the absorption of dietary calcium. In the context of the overall diet, however, this does not appear to be significant. Calcium from low-oxalate vegetable greens, such as kale, is absorbed as well or better than calcium from cow's milk.

Calcium deficiency in vegetarians is rare, and there is little evidence to show that calcium intakes below the Dietary Reference Intake cause major health problems in vegetarians. U.S. recommendations for calcium are relatively high compared to those for populations that eat a more plant-based diet. High levels of animal protein increase urinary loss of calcium. U.S. recommendations are designed to compensate for this. Studies show that vegetarians absorb and retain more calcium from food than do nonvegetarians.

Iron combines with protein to form hemoglobin, the substance in the blood that carries oxygen and carbon dioxide. An adequate intake of iron is necessary to prevent anemia. Many Americans, both meat-eaters and vegetarians, have a difficult time consuming enough iron.

Iron is found in animal and plant foods, but the iron in animal foods is more easily absorbed by the body. Also, the iron in plant foods may be less available to the body because of their high fiber content. Fiber is not absorbed

Figure 1: Go to the Web site www.MyPyramid.gov to find your personalized pyramid for good health. Although there is not a specific MyPyramid for vegetarians, it is possible to follow MyPyramid by making appropriate substitutions which fit your diet. For example, in the meat and bean category, meat can be replaced with meat substitutes; milk substitutes can be used in place of milk products, and so on.

Table 1: Daily food guide for vegetarians. Below are suggested daily servings, based on a 2000 calorie diet, from each of the food groups in MyPyramid.

Food group	Suggested Daily Amounts	Serving Sizes
Grains	6 ounces	1 slice bread; 1/2 cup cooked cereal, rice or pasta; 1/2 bagel or English muffin; 6" tortilla
Vegetable	2 1/2 cups	1/2 cup cooked, chopped or raw vegetables; 1 cup raw leafy vegetables; 3/4 cup vegetable juice
Fruit	2 cups	1 medium piece of fruit; 1/2 cup canned, chopped, or cooked fruit; 3/4 cup fruit juice
Milk and milk substitutes	3 cups	1 cup of milk or yogurt; 1 cup calcium and B_{12} fortified soy milk; 1 1/2 oz. hard cheese; 1 1/2 oz. calcium and B_{12} fortified soy cheese
Meat and fish substitutes	5 1/2 ounces	1 cup cooked dry beans, peas or lentils; 2 eggs; 8 oz. bean curd or tofu; 1/2 cup shelled nuts; 3-4 Tbsp peanut butter
Vegans*	1 serving daily	3-5 tsp vegetable oil + 1 Tbsp blackstrap molasses + 1 Tbsp brewer's yeast

* This is for vegans who do not consume fortified products. This group at the tip of the pyramid is for vegans who do not consume fortified products. The vegetable oil is for calories and essen-tial fatty acid; the molasses for iron and calcium; and the yeast for B-vitamins, especially riboflavin. Fortified brewer's yeast has B_{12}.

References

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"Position of the American Dietetic Association and Dietitians of Canada: Vegetarian Diets. Journal of the American Dietetic Association. *2003;103:748-765.*

Vegetarian Pyramid. New York Medical College. 1994.

Vegetarians should follow the prudent diet principles recommended in the Dietary Guidelines for Americans. Well-planned vegetarian diets can effectively meet these guidelines and be a health-supporting dietary alternative.

into the body. It may tie up minerals, such as iron, so they, too, are not absorbed. For these reasons, vegetarians may be at a higher risk for developing iron deficiency. Because women need more iron than men, they especially need to pay attention to iron.

Among plant foods, dark green leafy vegetables have the highest iron content. Dried fruits, such as raisins, apricots, peaches and prunes, also are high in iron. Eat plant sources of iron at the same meal as foods high in vitamin C (Brussels sprouts, strawberries, citrus fruits, broccoli, collard greens, mustard greens, cantaloupe, or vitamin C-rich fruit juices). Vitamin C increases the availability of iron in the intestinal tract. When vitamin C and iron are eaten together, more iron is absorbed into the body.

Legumes

Vegetarians, as well as meat-eaters, find that legumes — dry beans, dry peas and lentils — are an excellent food to extend or replace meat. Legumes are low in cost, high in nutritive value, and contribute iron and B vitamins to the diet. Although their protein quality is low, they can be combined with small amounts of animal food, such as milk, eggs or cheese, or with other plant foods, such as grains, to yield high-quality proteins.

Dry beans are rich in protein, iron, calcium, phosphorus and potassium. Many varieties of dry beans include black beans, garbanzo beans (also called chick peas), kidney beans, lima beans, navy beans and pinto beans.

Dry peas are good sources of protein, iron, potassium and thiamin. They are green or yellow and can be purchased split or whole.

Lentils are disc-shaped legumes similar in size to peas. They are rich in protein, iron, potassium, calcium and phosphorus.

Summary

A vegetarian diet can meet daily nutrient needs. Vegetarians should be aware of which nutrients may be lacking in their diets. Vegans need a reliable source of vitamins B_{12} and D. Riboflavin, calcium and iron may also deserve special attention, although intakes usually are adequate if the diet contains reasonable variety and adequate energy.

Because it may be difficult for infants, young children, adolescents and pregnant and lactating women to get enough calories and nutrients, vegan diets for these groups should be well-planned and supervised by a qualified health professional.

[1]*J. Anderson, Colorado State University Extension food and nutrition specialist and professor, food science and human nutrition; and S. Prior, former graduate intern, food science and human nutrition.*