

This issue's topic

ADOLESCENT VEGETARIANISM

INTRODUCTION

Vegetarians often adopt their eating behaviors for religious, cultural, or personal reasons. Some vegetarians tend to glamorize or oversimplify vegetarianism, leading many adolescents to believe that vegetarianism is an ideal diet that is easy to adopt. A vegetarian diet is not an ideal diet and it is not easy to adopt. A vegetarian diet can be nutritionally adequate; however, vegetarianism promotes a restricted eating pattern that requires a great deal of guidance and awareness. This fact sheet is intended to help educators and counselors better understand — and thereby more accurately communicate to students — the issues that need to be considered when an adolescent chooses to adopt a vegetarian diet.

Types And Extent Of Vegetarianism

One of the problems common to many discussions of vegetarianism is the failure to recognize that there are many types of vegetarian diets, and that each type poses different risks. Adolescents who adopt a vegetarian diet — and those who provide guidance — need to understand what kind of “vegetarian” diet is being adopted. In general, a “vegetarian” diet consists of plant sources of food — grains, legumes, nuts, vegetables, and fruits — and excludes all or certain animal foods. In general, nutrition professionals identify four categories of vegetarian diets (1):

- **Strict vegetarian (vegan):** follows an eating plan with no animal products.
- **Lacto-vegetarian:** eats dairy products but not meat, poultry, fish, or eggs.
- **Lacto-ovo-vegetarian:** eats dairy products and eggs, but not meat, poultry, or fish.
- **Semi-vegetarian:** mostly follows a vegetarian eating pattern but occasionally eats meat, poultry, or fish.

Other variations of vegetarian diets include “pesco” (eats fish but not meat or poultry), “pollo” (eats poultry but not meat or fish), or “pesco-pollo” (eats fish and poultry but not meat).

Not surprisingly, the almost unlimited number of possible combinations of “vegetarian” diets has led to confusion about the incidence of vegetarianism. For example,

a survey commissioned by *Vegetarian Times* magazine in 1992 found that 7% of the total population identified themselves as “vegetarian” (2). In 1997, the *Journal of The American Dietetic Association* conducted a survey that clarified the meaning of “vegetarian”: About 5% of the respondents did not eat red meat, 4% did not eat fish and seafood, and 2% did not eat poultry. Less than 1% were strict vegetarians (3). These results suggest that few Americans actually adopt true vegetarian diets.

Healthfulness Of Vegetarian Diets

Although vegetarian diets can be nutritionally adequate and associated with good health, research does not show a conclusive cause-and-effect relation between consumption of a vegetarian diet and specific health benefits. Self-described vegetarians tend to be more health-conscious than the general population; therefore, population-based studies that compare vegetarians with the general population may mistakenly attribute health benefits to vegetarian eating patterns when in fact the perceived health benefits may be caused by lifestyle factors other than diet, such as low incidence of smoking, low consumption of alcohol, or regular exercise (4).

A recent University of British Columbia study compared 100 vegetarian women with 93 non-vegetarian women, all of whom practiced similar health-conscious lifestyles.

The authors of the study found that both vegetarians and nonvegetarians met many current nutrition recommendations and concluded that “relative body weight and dietary quality may not differ greatly between similarly health-conscious vegetarians and nonvegetarians” (5).

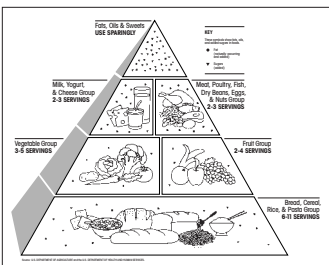
Nutrition Risks Of Vegetarian Diets

Adolescent vegetarians may mistakenly believe that the alleged health benefits of a vegetarian diet derive simply from “the avoidance of animal foods.” By eliminating a major source of nutrients from the diet, an adolescent vegetarian adopts what is called a “restrictive diet,” which requires even more careful planning than a normal diet. The U.S. government’s Dietary Guidelines for Americans report points out that meat, fish, and poultry are major contributors of iron, zinc, and B vitamins in most American diets, and vegetarians must pay special attention to these nutrients. Because animal products are the only food sources of vitamin B-12, vegans must supplement their diets with a source of this vitamin. In addition, vegan diets, particularly those of children, require care to ensure adequacy of vitamin D and calcium (6). The American Dietetic Association points out that vegetarian diets must be “appropriately planned” (7). The American Academy of Pediatrics acknowledges that “properly planned” vegetarian



Food Guide Pyramid

The Food Guide Pyramid illustrates the research-based food guidance system developed by the U.S. Department of Agriculture (USDA) and supported by the U.S. Department of Health and Human Services (HHS). The Pyramid presents a general guide to choosing a healthful diet. It recommends eating a variety of foods for essential nutrients and appropriate amounts of calories to maintain or improve body weight. The Pyramid emphasizes foods from the five major food groups shown in the three lower sections of the Pyramid. Each of these food groups provides some, but not all, of the essential nutrients. Foods in one group cannot totally replace those in another. No one food group is more important than another — all are necessary for good health (6).



diets can be nutritionally adequate but warns that “numerous restrictions or ill-advised meal planning may result in diets that are dangerous” (8).

Beef is a valuable component of the Food Guide Pyramid’s Meat Group, which includes red meat, poultry, fish, dry beans, eggs, and nuts. Of these, beef supplies the highest proportion of protein, B-vitamins, iron, zinc, and

other essential nutrients. The Food Guide Pyramid suggests two to three servings (five to seven ounces) each day of foods from this group (6). Adolescents who exclude whole categories of foods from their diets may eliminate some important sources of nutrients. They also may overconsume other categories. This risk is greatest for people with high nutritional needs, such as growing children (9).

Adopting a vegetarian diet does not ensure a healthful eating style. A vegetarian eating style can be high in fat and cholesterol, low in fiber, or both. Poorly planned, the chance for some nutritional deficiencies goes up (1). Studies of female adolescents have shown that lacto-ovo-vegetarians, semi-vegetarians, and vegans are more at risk for nutrient inadequacies than their counterparts who consume animal products (10).

Adolescent vegetarians need to plan their diets carefully and monitor their intakes of certain kinds of food to be sure they are consuming adequate amounts of nutrients, such as iron, zinc, vitamin B-12, and protein.

• **Iron**

Iron deficiency is a potentially serious problem among a wide variety of adolescent groups: young males, older females, members of low-income families, pregnant females, vegetarians, and athletes. Iron requirements are

heightened during adolescence because of increases in lean body mass, blood volume, and hemoglobin concentration (11).

Although adolescents, particularly young women, are among the groups most in need of iron, they also are among the groups most likely to consume inadequate amounts of iron. The U.S. Department of Agriculture’s 1994-1996 Continuing Survey of Food Intakes by Individuals reports that only 28% of girls 12-19 years of age and only 26% of women 20-29 years of age meet 100% of the RDA for iron (12).

Many foods in the diet contain iron, but this iron is not always easily absorbed by the body. Iron is available in the diet in two forms, heme and nonheme iron. Red meat, poultry, and fish

contain heme iron, which is much more easily absorbed by the body than nonheme iron, found mainly in plant foods. Of all the meats, beef contains the most heme iron. Also, absorption of nonheme iron increases two- to four-fold when red meat, poultry, or fish is eaten in the same meal. This enhancing effect is sometimes referred to as the “meat factor.” For example, when meat and vegetables are eaten together, more iron from the vegetables is absorbed than if the vegetables are eaten alone (13).

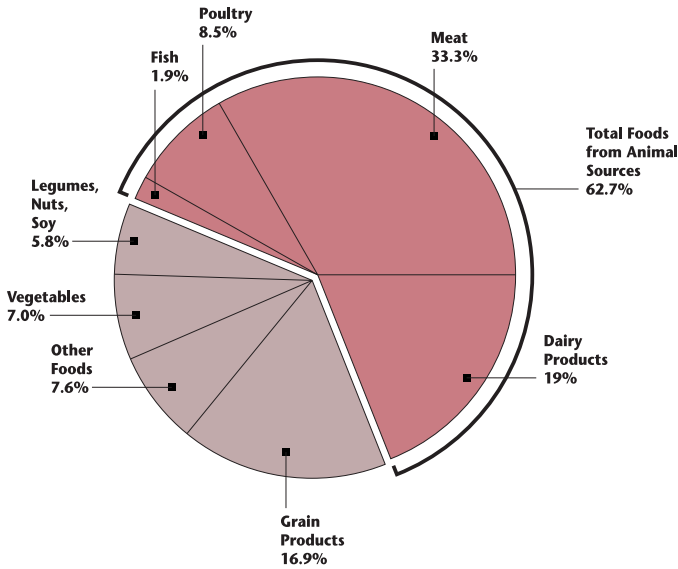
The concepts of “heme iron v. nonheme iron” and the “meat factor” help explain the research finding that vegetarians tend to have lower iron stores than nonvegetarians even when vegetarian diets contain higher total iron content (14). Studies show that

IRON CONTENT OF FOODS (15)

Food	Total Iron (mg)	Absorbable Iron (mg)
HEME Iron Sources		
Beef liver, pan fried (3 oz.)	5.3	.70
Oysters, 6 medium raw	4.8	.64
Sirloin, broiled (3 oz.)	2.9	.37
Ground beef, extra lean, broiled, well done (3 oz.)	2.4	.31
Turkey breast, roasted (3 oz.)	1.3	.17
Pork tenderloin, roasted (3 oz.)	1.2	.16
Chicken breast, roasted (3 oz.)	.90	.12
Tuna fish, canned (3 oz.)	.80	.11
Veal cutlet, pan fried (3 oz.)	.70	.10
Non-HEME Iron Sources		
Raisin bran, dry, (1 cup)	5.0	.25
Kidney beans, boiled, (1/2 cup)	2.6	.13
Bagel, enriched (one half)	1.2	.06
Spinach, raw (1/2 cup)	.80	.04
Egg, large, hard-boiled	.60	.03
Apple, 1 medium	.20	.01
Milk, 1% (1 cup)	.10	.01



ZINC CONTENT OF FOODS (16)



people who include moderate amounts of red meat (beef, pork, veal, lamb, and processed meat) in their diets have better iron stores compared with people who mainly eat poultry and/or fish or a lacto-ovo-vegetarian diet (13).

- **Zinc**

Physiological processes such as growth increase the need for zinc. For this reason, young children, adolescents, and pregnant women may be at high risk for the development of zinc deficiency. Today marginal or mild zinc deficiency represents a health problem for a substantial segment of the United States population. Zinc is recognized to be essential not only for growth and development, but also for a wide range of clinical, biochemical and immunological functions in the body. It is required

for the activity of several hundred enzymes involved in most major metabolic pathways in the human body (17).

The composition of the diet has important effects on zinc absorption. Beef, for example, not only is an excellent source of zinc, but zinc from beef is readily available. Including beef in the diet also improves the absorption of zinc from other foods (18). The absorption of zinc from beef has been demonstrated to be about four times greater than that from a high-fiber breakfast cereal when consumed by healthy adults (19).

Because of the low bioavailability of zinc in many plant foods, vegetarian diets potentially can have an adverse effect on zinc status. Careful food choices made within the framework of a vegetarian

diet are necessary to ensure that the quantity and/or quality of zinc intake is not compromised (7).

- **Vitamin B-12**

Vitamin B-12 deficiency can be extremely serious. It can cause severe anemia and irreversible damage to the nervous system. Vitamin B-12 is normally found only in foods of animal origin. For strict vegetarians, vitamin B-12 is a nutrition concern (1). Even adolescent vegetarians who consume eggs and dairy products should take precautions to prevent vitamin B-12 deficiency. Research suggests that lacto-ovo-vegetarians have low blood levels of vitamin B-12. Supplementation or use of fortified foods is advised for vegetarians who avoid or limit animal foods. Because vitamin B-12 requirements are small, and it is both stored and recycled in the body, symptoms of deficiency may be delayed for years.

- **Protein**

A carefully planned vegetarian diet, particularly one that includes eggs and dairy products, usually can provide adequate protein, provided that the overall diet includes different types of plant foods and that the total amount of food is sufficient to meet energy needs. Adolescent vegetarians — particularly strict vegetarians — need to be aware that their protein

needs may be somewhat elevated because of the lower quality of some plant proteins (7). Beef is considered a “complete protein” because it contains all the essential amino acids the human body needs.

Recommendations For Managing Vegetarian Diets

If adolescents understand the principles of vegetarian meal planning and practice these principles sensibly, they probably will not encounter major nutrition-related health problems. In reality, however, adolescent vegetarians usually lack sufficient knowledge of nutrition and vegetarian meal planning. They may also have little motivation to learn how to practice vegetarianism in a healthful way.

General educational efforts are needed to teach adolescents how to eat more healthfully and how to contend with fad diets and nutrition misinformation (11). The eating patterns of vegetarians vary considerably. Therefore, individual assessment is required to accurately evaluate the nutritional quality of an adolescent’s vegetarian dietary intake (7).

Parents, educators, and other adult influencers can ensure that discussions of vegetarianism take place in a rational, scientific atmosphere where adolescents can learn to think clearly about the consequences of critical life decisions, such as lifelong eating patterns.



CURRENT RESEARCH TOPICS

Iron, Zinc, And Cognition

Iron and zinc deficiencies can contribute to severe problems in normal brain growth and development. The U.S. Department of Agriculture's 1994-1996 Continuing Survey of Food Intakes by Individuals reports that nearly 40% of Americans are not meeting needs for iron; 73% are not meeting needs for zinc (12).

The link between iron, zinc, and cognition is well established — deficiencies impair mental performance throughout the lifecycle. Deficits are also linked to growth retardation, neuro-sensory changes (abnormal dark adaptation and alteration in taste acuity), delayed wound healing, and decreased immune functions. Recent research suggests that even mild, short-term deficiencies may impair mental acuity by decreasing attention span, learning ability, short-term memory, and problem-solving skills.

Beef provides higher percentages of bioavailable iron and zinc than any other single food. In foods outside the Meat Group, iron and zinc are found in much smaller amounts that are less readily absorbed (20).



Conclusion

The healthfulness of a diet depends on making informed choices and leading a physically active lifestyle. For those adolescents who enjoy meat, they can find many health benefits in a carefully planned diet containing meat. On the other hand, a "vegetarian" eating pattern can be high in fat, low in fiber, or both, and can increase the chances for some nutritional deficiencies. No single dietary pattern, including vegetarianism, has been shown to be nutritionally superior to any other well planned diet based on the U.S. Food Guide Pyramid.

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