

Nutrition Guideline

Vegetarian Eating

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

Recommendations

Healthy vegetarian diets that follow Canada's Food Guide are nutritionally adequate.

- Chose a variety of foods from the Food Guide every day, including vegetables, fruits, whole grains, and protein-rich foods such as soy foods, legumes (beans, peas and lentils), nuts, seeds, and if desired, eggs and milk and alternatives.
- Chose vegetarian foods that are sources of protein, calcium, vitamin D, iron, vitamin B₁₂, zinc, and omega-3 fatty acids every day.
- People following a vegan diet may need to supplement their diet with vitamins B₁₂ and D, calcium, omega-3 fats and should take special care to obtain enough iron.

Consult a Registered Dietitian if guidance is needed to follow a vegetarian diet.

Health Benefits

Following a well-planned vegetarian diet may:¹

- Achieve a lower body mass index
- Reduce blood pressure
- Reduce the risk of cardiovascular disease (CVD)
- Reduce the risk of type 2 diabetes
- Reduce the risk of prostate and colon cancer

Key Questions

What are the different types of vegetarian diets?

- **Semi** – occasional meat eaters who primarily follow a vegetarian diet OR those who consume fish and poultry but less than once a week.¹
- **Lacto-ovo vegetarian** – excludes red meats, poultry and fish, but allows eggs and milk and alternatives.¹
- **Lacto vegetarian** – excludes red meats, poultry, fish and eggs, but allows milk and alternatives.¹
- **Vegan** – excludes all foods of animal origin including red meats, poultry, fish, eggs, milk and alternatives.¹

Is there a different food guide for vegetarians?

Canada's Food Guide is suitable for individuals following a vegetarian diet. To ensure adequate intake of nutrients, vegetarians can chose either milk or fortified soy beverages as part of the Milk and Alternatives food group; and a variety of meat alternatives such as legumes (beans, peas and lentils), eggs, tofu, soy-based meat substitutes, nuts, nut butters and seeds from the Meat and Alternatives food group.²

Are vegetarian diets appropriate for all stages of the life cycle?

A healthy vegetarian diet is appropriate for all stages of the life cycle including childhood*, adolescence, adulthood, pregnancy, and lactation. An appropriately planned vegetarian diet is supportive of good nutritional status and health.¹

*Parents and caregivers who would like to exclude all animal products from their child's diet should consult a Registered Dietitian to ensure nutrient requirements are met.

How can vegetarians meet their protein needs?

Protein is needed for the growth and repair of body tissues and for immune function.³ When a mixture of protein-rich plant foods is consumed and energy needs are met, protein requirements can be reached.¹

Good sources of plant protein are:¹

- All soy products (fortified soy beverages, tofu, tempeh, cooked soybeans, and soy nuts)
- Meat analogs
- Nuts, seeds, and their butters
- Legumes, including beans, peas and lentils

Research has shown that vegans, as well as vegetarians who include eggs and milk and alternatives in their diet, typically meet and exceed protein requirements.¹ Vegetarian athletes can also meet protein needs on an appropriately-planned plant-based diet without the need for protein supplements.¹

Refer to Guideline: Nutrition and Physical Activity

How can vegetarians meet their calcium and vitamin D needs?

Calcium and vitamin D are needed for proper growth and maintenance of healthy bones and teeth, as well as for other body functions.⁴

Excellent sources of calcium include milk products such as milk, yogurt and cheese. Non-dairy calcium sources include soy foods (soybeans, fortified soy beverages, calcium-set tofu), almonds or soy nuts, calcium-fortified breakfast cereals, collard greens, mustard greens, bok choy, Chinese cabbage, okra, kale, broccoli, and calcium-fortified orange juice.^{1,5}

Natural food sources of vitamin D are limited. The best sources include salmon and herring. Other natural sources are sardines, halibut and eggs. However, most vegetarians do not consume fish or eggs.^{1,5} In Canada, vitamin D fortification of cow's milk and margarine is mandatory. In addition, some brands of soy, rice and almond beverages, orange juice, and some breakfast cereals are fortified with vitamin D.^{1,5}

Vegetarians should read food labels for information about amounts of calcium and vitamin D in foods.

There is recent evidence that vitamin D deficiency exists in some Canadians, partly because of low levels of sun exposure.⁶ As well, it is widely agreed that consuming adequate amounts of vitamin D from dietary sources is difficult.^{6,7}

In view of low levels of vitamin D intake from food and probable low levels from sun exposure, Nutrition Services, Alberta Health Services recommends **that healthy individuals include food sources of vitamin D in their diet, and supplement their intake as follows:**

- 1 to 70 years, including pregnant and lactating women: take 400 IU vitamin D per day as a supplement
- Over the age of 70: take 800-1000 IU per day as a supplement

Individuals who are concerned about their calcium and vitamin D intake should consult with a Registered Dietitian.

For complete recommendations refer to Guideline: Calcium and Vitamin D

How can vegetarians meet their iron needs?

The most significant roles of iron are its synthesis of hemoglobin and myoglobin in supporting immune function, and its role in energy metabolism.³

Vegetarians need close to two times more iron than non-vegetarians due to the lower absorption of iron from plant sources.¹ The type of iron in plant foods is sensitive to inhibitors and enhancers of iron absorption. Inhibitors of iron include phytates (found in the husks of grains, legumes—beans, peas and lentils—and seeds), fibre (found in whole grains, fruits and vegetables), calcium (found in milk and alternatives), teas (regular and some herbal), coffee and cocoa.¹ The main inhibitor of iron in vegetarian diets is phytate.¹ Vitamin C and organic acids, found in vegetables and fruit, greatly reduce the inhibitory effects of phytate.¹

Vegetarians should choose iron-rich foods every day. These include dark green leafy vegetables, grain products made with iron-enriched flour, whole grains, blackstrap molasses, dried fruit (apricots, raisins and dates), nuts and seeds, tofu, eggs, and legumes (beans and lentils).⁸

In order to increase iron absorption, vegetarians should:

- Consume fruits and vegetables high in vitamin C and organic acids (peppers, broccoli, kale, oranges, grapefruit, strawberries and cantaloupe).¹
- Avoid tea and coffee at meal times.¹
- Cook in cast-iron cookware to increase the amount of iron in foods.^{9,10}
- Take their iron supplement or vitamin and mineral supplement (if they are taking one) at different times than when consuming milk and milk alternatives.¹

Refer to Guideline: Iron

How can vegetarians meet their vitamin B₁₂ needs?

Vitamin B₁₂ is needed for red blood cell production and the maintenance of healthy tissues in the gastrointestinal tract and nervous systems.³

Vitamin B₁₂ naturally occurs in animal products such as meat, poultry, eggs and milk and alternatives.¹ Sea vegetables, spirulina and fermented soy products contain vitamin B₁₂ analogs but these do not provide a reliable source of active vitamin B₁₂.¹ Plant foods do not contain a significant amount of vitamin B₁₂, unless they have been fortified.¹

Based on the DRIs for vitamin B₁₂, and the average amounts in most vitamin B₁₂-rich foods, vegetarians should eat 2-3 servings of vitamin B₁₂-rich foods every day. Some vitamin B₁₂-rich foods are:^{1,9}

- Red Star® Vegetarian Support Formula nutritional yeast, 1 Tbsp (15 mL)
- Fortified vegetarian (soy, rice, or almond) beverage, 1 cup (250 mL)
- Cow's milk, 1 cup (250 mL)
- Yogurt, ¾ cup (175 mL)
- Egg, large, 2
- Fortified meat substitute (such as vegetarian ground round or patty), 1 serving (see package)

Individuals should be encouraged to read food labels. Vitamin B₁₂ content is not indicated on all food packages, but will be in the Nutrition Facts table if Vitamin B₁₂ has been added to the food.¹¹ Individuals are advised to consult with a Registered Dietitian if they need more guidance on food sources of vitamin B₁₂.

Individuals following a vegetarian diet who do not include the above foods regularly, should ask their doctor about testing blood levels of vitamin B₁₂, and should ask about taking a vitamin B₁₂ supplement.^{1,8,12}

Older adults absorb less vitamin B₁₂ from animal products such as eggs and milk. Adults aged 50 years and over should eat fortified foods regularly or take a vitamin B₁₂ supplement.⁸

How can vegetarians meet their zinc needs?

Zinc plays an important role in immune function, energy metabolism, and tissue formation.³

Vegetarian diets are usually high in phytate and fibre, which bind to zinc and thus reduce its absorption.¹ Soaking and sprouting beans, grains and seeds as well as leavening bread can reduce the binding of phytate to zinc and thus increase zinc absorption.¹

Every day, vegetarians should choose foods that are rich in zinc: Hard cheeses, eggs, yogurt, mushrooms, green peas, fortified cereals, wheat germ, sunflower seeds, cashews, pumpkin seeds, sesame tahini, almonds, peanuts, navy beans, canned vegetarian baked beans, chick peas, lentils, fortified meat substitute, soybeans, and tofu.⁸

How can vegetarians meet their omega-3 fatty acids needs?

Omega-3 fatty acids are essential fatty acids, meaning that they must be obtained from the diet.³ Omega-3 fatty acids play a role in brain and eye development and promote cardiovascular health.³

Omega-3 fatty acids include eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), and alpha-linolenic acid (ALA). More of the documented health benefits are from EPA and DHA than from plant-derived ALA.^{13,14} ALA is converted to EPA and DHA in humans, but the amount of ALA converted is very low.¹ However, the relative importance of the three omega-3 fats is not understood completely.

Fish, particularly fatty fish such as salmon, trout, sardines and mackerel are high in EPA and DHA.

The foods below are also higher in omega-3 fats:¹⁵

- sea vegetables such as arame, dulse, nori, kelp, kombu, or wakame
- omega-3 enriched eggs

Vegetarians should include at least two food sources of omega-3 fatty acids every day. Vegetarians may require a supplement if they don't regularly include the sources of omega-3 fats above.^{1,13,15} Omega-3 supplements made from microalgae would be appropriate for vegans. In stores, these supplements may be called omega-3 fatty acid or DHA supplements.^{1,15}

Other things to think about when trying to get enough omega-3 fats in your diet:

- limit trans and saturated fats¹⁶
- use canola or olive oil in cooking¹⁶
- include other foods that have ALA , like flaxseeds, flaxseed oil, walnuts¹⁶
- include foods with omega-3 fats added (like yogurt, soy beverages, margarine)

Individuals are advised to consult with a Registered Dietitian for more information on omega-3 fatty acids and supplement use.

Refer to Guideline: Heart Healthy

When should vegetarians seek the dietary advice of a Registered Dietitian?

Vegetarians should seek dietary advice from a Registered Dietitian when they cannot meet their nutrient requirements from food, and when they have questions about incorporating medically-related food restrictions. Vegetarians may need to take nutrient supplements if they cannot meet their requirements through food.

Vegetarians can find more information at websites like www.dietitians.ca or the Canada's Food Guide website ([www.hc-sc.gc.ca;search](http://www.hc-sc.gc.ca/search) for Canada's Food Guide), or www.eatrightontario.ca.

Are there any handouts on vegetarian eating I can use with my clients?

Refer to approved provincial Alberta Health Services nutrition handouts to support patient education. For more information, contact Nutrition.Resources@albertahealthservices.ca

Nutrition Guideline Vegetarian Eating

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

References

1. American Dietetic Association. Position of the American Dietetic Association: Vegetarian diets. *Journal of the American Dietetic Association*. 2009;109:1266-82.
2. Health Canada. [homepage on internet] Canada's Food Guide. Frequently Asked Questions. [modified 2010 Jan; cited 2012 Dec 11]. Available from: <http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/context/faq-eng.php#10>
3. Wardlaw GM, Hampl JS, DiSilvestro RA. *Perspectives in nutrition*. 6th ed. New York (NY): McGraw Hill; 2004. p. 182,240,349,389,423,426.
4. Institute of Medicine. Dietary Reference Intakes for Calcium and Vitamin D [Internet]. 2010 Nov 30 [cited 2013 Jan 18]. Available from: <http://www.iom.edu/Reports/2010/Dietary-Reference-Intakes-for-Calcium-and-Vitamin-D.aspx>
5. Messina V, Melina V, Mangels AR. A new food guide for North American vegetarians. *Canadian Journal of Dietetic Practice and Research*. 2003;64(2):82-6.
6. Hanley, DA, Cranney A, Jones G, Whiting SJ, Leslie WD, Cole DEC, et.al. Vitamin D in adult health and disease: a review and guideline statement from Osteoporosis Canada. *Canadian medical Association Journal* 2010; 182(12): 610-8.
7. Holick MF, Binkley NC, Bischoff-Ferrari HA, Gordon CM, Hanley DA, Heaney RP et al. Evaluation, treatment, and prevention of vitamin D deficiency: an endocrine society clinical practice guideline. *J Clin Endocrinol Metab* 2011 July;96(7):1-19.
8. Dietitians of Canada. Position of the American Dietetic Association and Dietitians of Canada: Vegetarian diets. *Can J Diet Pract Res*. 2003;64(2):62-81.
9. Park J and Brittin HC. Iron content, sensory evaluation, and consumer acceptance of food cooked in iron utensils. *J Food Quality* 2000; 23:205-15.
10. Kollipara UK and Brittin HC. Increased iron content of some Indian foods due to cookware. *Journal of the American Dietetic Association*. 1996; 96(5):508-10.
11. Canadian Food Inspection Agency. [updated 2011 Nov 21; cited 2012 Dec 11]. Guide to Food Labelling and Advertising, Chapter 5: Nutrition Labelling [about 2 screens]. Available from: http://www.inspection.gc.ca/english/fssa/labeli/guide/ch5e.shtml#a5_4,
12. Dietitians of Canada. Vegetarianism Evidence Summary. In: Practice-based Evidence in Nutrition [PEN]. 2012 Apr 25 [cited 2012 Aug 27]. Available from: <http://www.pennutrition.com/KnowledgePathway.aspx?kpid=2709&trcatid=42&trid=3216> Access only by subscription
13. Akabas SR, Deckelbaum, RJ. Summary of a workshop on n-3 fatty acids: current status of recommendations and future directions. *Am J Clin Nutr* 2006;83(suppl):1536S-8S.
14. Dietitians of Canada. What is the recommended dietary intake of omega-3 fatty acids for secondary prevention of cardiovascular disease? In: Practice-based Evidence in Nutrition [evidence library on internet]. Updated 2007 Oct 17 [cited 2012 Dec 12]; Available from: <http://www.pennutrition.com/KnowledgePathway.aspx?kpid=2671&pqcatid=146&pqid=2609> Access only by subscription
15. Kris-Etherton PM, Hill AM. n-3 fatty acids: food or supplements? *Journal of the American Dietetic Association* 2008;108(7):1125-30.

Nutrition Guideline

Vegetarian Eating

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

16. Dietitians of Canada. Vegetarianism: Key Practice Points. In: Practice-based Evidence in Nutrition [PEN]. 2012 Feb 21 [cited 2012 Aug 27]. Available from: <http://www.pennutrition.com/KnowledgePathway.aspx?kpid=2709&pqcatid=144&pqid=2676>. Access only by subscription.