

Bone Health Nutrition for Vegans and Vegetarians

Men and women who consume a vegan or vegetarian diet need to ensure they get adequate amounts of key nutrients in order to maintain good bone health.

In general, many nutrients are more bioavailable when they come from animal sources rather than plant sources. **Bioavailability** refers to the amount of the target nutrient that is absorbed and available for use once it enters the body. This depends on many factors, including what other nutrients are present in the food item and whether they hinder or enhance absorption of the target nutrient. Vitamin C, for example, enhances the absorption of iron, while chemicals such as oxalates and phytates found in many plant foods decrease the absorption of calcium.



The nutrients listed below are important in maintaining bone health and need special attention in vegan and vegetarian diets.



• Calcium

Lactovegetarians can get plenty of calcium from milk products, which are rich in calcium, and also have good bioavailability of calcium.

Vegans should consume a variety of calcium sources in order to meet daily requirements. Although the

bioavailability of calcium in some plant foods is higher than in milk, the amount of calcium in these foods is lower. Therefore, the total absorbed calcium from non-milk sources is often low. For example, only about 5% of the calcium in cooked spinach is absorbed because of its high oxalate content. The list below includes the amounts of various foods that need to be consumed in order to obtain the same amount of calcium found in 1 cup of milk.

- buttermilk, kefir, yogurt or chocolate milk (whole, 2%, 1%, skim) - 1 cup
- cheddar cheese - 1.5 oz
- bok choy (cooked) - 1 cup
- kale, chinese spinach (cooked) - 1.5 cups
- broccoli (cooked) - 2 cups
- almonds - 1 cup
- white beans (cooked) - 2 cups
- pinto beans (cooked) - 4 cups

Some calcium-fortified foods are a good source of calcium as its bioavailability is comparable with that of milk. 1 cup of orange juice (with calcium citrate malate), 1.5 cups of soy, rice, or almond beverage (fortified with tricalcium phosphate), and 6 oz of tofu (prepared with calcium sulfate) all have the same amount of calcium as 1 cup of milk. Keep in mind, the added calcium in liquids tends to settle to the bottom of the food container and vigorous shaking is needed to re-suspend the calcium salts.

Other vegetarian-friendly sources of calcium are collard, turnip and mustard greens, rappini, chickpeas, blackstrap molasses, and figs.

• Vitamin D

Few foods are naturally high in vitamin D, but milk is fortified with vitamin D in Canada. Some soymilk, orange juice, and ready-to-eat cereals are also fortified with vitamin D and can be good sources. Egg yolk is also a good source of dietary vitamin D. Vegans may need to consider taking a vitamin D supplement to meet the daily recommendations.



• Iron

Vegans and vegetarians need to consume a variety of plant-based iron sources to meet the daily requirements as the

bioavailability of iron in plant foods is lower than in animal products. In addition, consuming foods high in vitamin C such as citrus fruits and tomatoes at each meal increases iron absorption. Good sources of iron include dried beans, dark green vegetables like spinach and beet greens, dried fruits, prune juice, blackstrap molasses, fortified breads and cereals, instant oatmeal, nuts and nut butters, potatoes (eaten with skin), and enriched pasta.

• Zinc

Because the bioavailability of zinc in plant foods is also lower than in animal products, zinc is another nutrient of concern for vegetarian and vegans. Non-meat sources of zinc include beans (soaking dried beans and discarding the soaking water before cooking increases zinc bioavailability), zinc-fortified breakfast cereals,

wheat germ, nuts and seeds, and cheese.

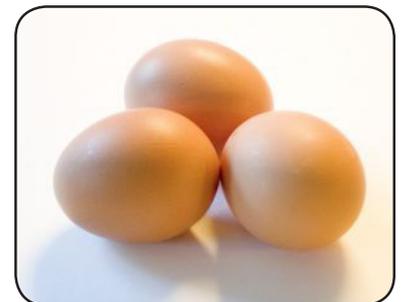
• Protein

Vegans and vegetarians need to combine different protein sources (grains, nuts, and beans) to have their protein needs met. However, combining different protein sources in the same meal is not necessary. Sources of protein for vegetarians and vegans include beans, wild rice, quinoa, soy products (tofu, tempeh, soy protein, veggie burgers), nut and nut butters, dairy products, eggs, and whole grains.



• Vitamin B12

B12 is only found in foods of animal origin. While lacto-ovo vegetarians can meet their daily requirements of vitamin B12 through consumption of eggs and dairy products, vegans may need to supplement their diet by consuming fortified foods such as nutritional yeast, soymilk, ready-to-eat breakfast cereals, or by taking a vitamin B12 (cobalamin) supplement to meet the daily recommendations.



• Omega-3 fatty acids

Although vegetarian and vegan diets are often rich in omega-6 fatty acids, they may be low in omega-3 fatty acids. Good dietary sources of omega-3 fatty acids for vegetarians and vegans are flax seed oil, canola oil, soybean oil, and walnut oil.

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