



## Calcium in the Vegan Diet

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From [Simply Vegan](#) 5th Edition

### Summary:

**Calcium, needed for strong bones, is found in dark green leafy vegetables, tofu made with calcium sulfate, calcium-fortified soy milk and orange juice, and many other foods commonly eaten by vegans. Although lower animal protein intake may reduce calcium losses, there is currently not enough evidence to suggest that vegans have lower calcium needs. Vegans should eat foods that are high in calcium and/or use a calcium supplement.**

Our bones contain large amounts of calcium, which helps to make them firm and rigid. Calcium is also needed for other tasks including nerve and muscle function and blood clotting. These tasks are so important for survival, that, when dietary calcium is too low, calcium will be lost from bone and used for other critical functions. The body tightly controls calcium in the blood, so measuring blood calcium levels cannot assess calcium status.

Because of heavy promotion by the American dairy industry, the public often believes that cow's milk is the sole source of calcium. However, other excellent sources

of calcium exist. Sources of well-absorbed calcium for vegans include calcium-fortified soy milk and juice, calcium-set tofu, soybeans and soynuts, bok choy, broccoli, collards, Chinese cabbage, kale, mustard greens, and okra <sup>1</sup>. Grains, beans (other than soybeans), fruits, and vegetables (other than those listed) can contribute to calcium intake but cannot replace these key foods.

**Table 1** shows the amount of calcium in selected foods. When you realize that there is as much or more calcium in 4 ounces of firm tofu or 3/4 cup of collard greens as there is in one cup of cow's milk, it is easy to see why groups of people who do not drink cow's milk still have strong bones and teeth.

The calcium recommendation for adults age 19-50 years and men 51-70 years is 1000 mg per day <sup>2</sup>. An intake of 1200 mg of calcium is recommended for women over 51 years and for men over 70 <sup>2</sup>. While not all studies find a reduced risk of fracturing bones to be associated with higher calcium intakes <sup>3,4</sup>, research does suggest that adequate calcium and vitamin D can reduce the risk of fractures and osteoporosis as people age <sup>5</sup>.

There are a limited number of studies of vegans, most of which find low bone density, as well as low calcium intakes <sup>6-8</sup>. Results of a meta-analysis that combined several studies predicted that vegans would have a slightly (perhaps 10%) higher risk of bone fracture compared to non-vegetarians <sup>8</sup>. One study found that, when calcium intakes were adequate (greater than 525 mg/day in this study), vegans had no greater risk of

breaking a bone than did non-vegetarians with similar calcium intakes <sup>7</sup>. Since many factors can affect calcium needs, we recommend that vegans try to meet the recommendations for the general public.

Our Vegan Food Guide indicates good sources of calcium from several food groups. By choosing the suggested number of servings of calcium-rich foods daily, vegans should meet calcium needs.

**Table 2** shows several menus that contain more than 1000 mg of calcium.

The amount of calcium in tofu depends on the coagulating agent used to precipitate the soy protein in the process of making tofu. Calcium sulfate and nigari (magnesium chloride) are two commonly used agents. The agent used will be listed on the label under ingredients. Tofu that is prepared with calcium sulfate will contain more calcium than tofu made with nigari.

To calculate how much calcium is in the tofu you buy, look at the label. Calcium content will be listed as percent of the Daily Value. Since the current Daily Value for calcium is 1000 mg, multiply the percent Daily Value by 10 to get the amount of calcium (in milligrams) in one serving. For example, tofu with 10% Daily Value for calcium would have 100 mg of calcium in one serving.

Protein's effect on calcium needs and bones remains uncertain. Some studies show that diets that are high in protein, especially animal protein, result in increased losses of calcium in the urine <sup>9</sup> and may be associated

with increased fracture risk [10,11](#). These effects of protein may be especially important in those with low calcium intakes [12](#). Other studies find advantages of a higher protein intake including promotion of calcium absorption [13](#), reduced risk of fracturing a bone [14](#), and increased bone density [15,16](#). Until we know more, our best recommendation is that vegans should strive to meet calcium recommendations and to have adequate, but not excessive, amounts of protein.

Other factors in bone health include vitamin D, sodium, and physical activity. Sodium increases the amount of calcium lost in urine (about 20 mg of calcium are lost with each gram of sodium in the diet) and higher dietary sodium is associated with lower bone density [17](#). Regular weight-bearing exercise such as walking or running helps to promote strong, healthy bones. Exercise can also improve balance and flexibility, important factors in preventing falls.

## Table 1: Calcium Content of Selected Vegan Foods

Food	Amount	Calcium (mg)
Blackstrap molasses	2 Tbsp	400
Collard greens, cooked	1 cup	357
Other plant milks, calcium-fortified	8 ounces	300-500
Tofu, processed with calcium sulfate*	4 ounces	200-420
Calcium-fortified orange juice	8 ounces	350
Soy or ricemilk, commercial, calcium-fortified, plain	8 ounces	200-300
Commercial soy yogurt, plain	6 ounces	300
Turnip greens, cooked	1 cup	249
Tofu, processed with nigari*	4 ounces	130-400
Tempeh	1 cup	184
Kale, cooked	1 cup	179
Soybeans, cooked	1 cup	175
Bok choy, cooked	1 cup	158
Mustard greens, cooked	1 cup	152
Okra, cooked	1 cup	135
Tahini	2 Tbsp	128
Navy beans, cooked	1 cup	126
Almond butter	2 Tbsp	111
Almonds, whole	1/4 cup	94
Broccoli, cooked	1 cup	62

\*Read the label on your tofu container to see if it is processed with calcium sulfate or nigari.

Note: Oxalic acid, which is found in spinach, rhubarb, chard, and beet greens binds with the calcium in those foods and reduces its absorption. These foods should not be considered good sources of calcium. Calcium in other green vegetables is well absorbed (1,18). Dietary fiber has little effect on calcium absorption.

Sources: USDA Nutrient Database for Standard Reference, Release 24, 2011 and manufacturers' information.

## Table 2: Sample Menus Providing More Than 1,000 Milligrams of Calcium

	Calcium (mg)
Breakfast:	
1 serving Cindy's Light and Fluffy Pancakes (p. 23) <sup>†</sup>	195
1 cup Calcium-Fortified Soy Milk	300
Lunch:	
1 serving Hummus on Pita Bread (p. 27)	178
6 Dried Figs	82
1/4 cup Almonds	94
Dinner:	
1 serving Scrambled Tofu and Bok Choy over Brown Rice (p. 96)	190
1 serving Green Salad and Tangerine Dressing (p. 39)	30
1 serving Chocolate Pudding (p. 114)	92
<b>TOTAL</b>	<b>1161</b>
Breakfast:	
1 serving Tropical Fruit Smoothie (p. 16)	102
1 Toasted medium Bagel with	93
2 Tbsp Almond Butter	111
Lunch:	
1 serving Mini Pizzas (p. 34)	235
1 serving Creamed Spinach (p. 68)	121
Dinner:	
1 serving Lemon Rice Soup (p. 46)	82
1 serving Tofu Squash Burgers (p. 102)	135
1 cup Steamed Broccoli	62
1 serving Chocolate Pudding (p. 114)	92
<b>TOTAL</b>	<b>1033</b>

<sup>†</sup>Note: Page Numbers refer to recipes in the book [Simply Vegan](#).

Additional foods should be added to these menus to provide adequate calories and to meet requirements for nutrients besides calcium. There are factors that increase the risk of osteoporosis and that cannot be changed. These include small frame size, female gender, aging, heredity, being Caucasian or of Asian or Latino descent, early menopause, and prolonged immobilization. Other factors like cigarette smoking, excessive alcohol, physical inactivity, and inadequate calcium and vitamin D (see Chapter on Vitamin D) are under our control. Vegans of all ages can promote bone health by consuming enough calcium and protein, getting adequate vitamin D, limiting use of sodium, and getting regular exercise, especially weight-bearing exercise.

## References

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