



## Them bones need plenty of calcium

BONES are hard, but they aren't inactive. Some of the calcium in your bones is mobilized and released into your blood everyday. If enough calcium is available in the blood, the lost calcium is replaced in the bones and there is no net change. However, if your diet doesn't contain enough calcium, your bones will steadily lose calcium and become weaker. The result is a painful condition called osteoporosis. Often thought to affect only women, osteoporosis also occurs in men who live long lives.

Many factors are involved in the development of osteoporosis. However, a low calcium diet is a major factor. Choosing good calcium sources isn't as easy as it appears. Nutrient databases produce lists of calcium containing foods based on chemical analysis. However, the lists can be misleading. Many factors can affect the amount of calcium the body absorbs from foods.

Foods containing calcium that our bodies can absorb readily are considered to be highly bioavailable sources of calcium. Foods with compounds that interfere with calcium absorption are con-

sidered to have poor calcium bioavailability. For example, spinach is high in calcium, but only about five percent of that calcium can be absorbed due to a conflicting food component known as oxalate. Other foods with low calcium bioavailability are rhubarb, most beans, nuts, and seeds.

ALMONDS are frequently listed as a good source of calcium. After all, one ounce of almonds contains 80 mg of calcium, about twice as much as one ounce of milk. But due to the low bioavailability of calcium from almonds (17 percent) and their relatively high fat content, you need to consume 1000 calories of almonds to absorb 100 mg of calcium.

This is in contrast to about 125 calories of 2 percent milk to absorb 100 mg of calcium.

Tofu made with calcium sulfate ranks as a good calcium source based on the United States Department of Agriculture (USDA) nutrient database.

However, some food labels of locally produced tofu brands indicate that their tofu contains about one-third the calcium listed by

USDA for tofu, making it only a fair source of calcium. Chemical analysis at the University of Hawaii confirmed the lower calcium content. Silken tofu comes in soft to firm textures and even low-and nonfat varieties. This type of tofu is processed differently than calcium-set tofu and is a poor source of calcium.

MILK is generally held up as the calcium "gold standard" because it is a concentrated calcium source that is readily absorbed. Other good sources include some green vegetables and calcium fortified foods. The following list of cooked vegetables shows some nondairy foods with high calcium bioavailability. The quantities presented are the amounts that provide absorbable calcium comparable to 1 cup of milk.

- ▶ Bok choy (1-1/4 cups)
- ▶ Broccoli (2-1/4 cups)
- ▶ Choy sum (1/2 cup)
- ▶ Kai choy (about 1 cup)
- ▶ Kale (1-1/2 cups)

Other reasonable sources include calcium fortified orange juice (3/4 cup), calcium fortified soy milk (varies, but about 1-1/2 cups) and calcium fortified cereals (varies).

---

Alan Titchenal, Ph.D, CNS and Joannie Dobbs, Ph.D, CNS  
are nutritionists in the Department of Human Nutrition, Food and Animal Sciences,  
College of Tropical Agriculture and Human Resources, UH-Manoa.  
Dr. Dobbs also works with the University Health Service.

---