

# Calcium

## Facts:

- ◆ Calcium is the most abundant mineral in the body. It is also the fifth most common substance in the body after carbon, hydrogen, oxygen, and nitrogen. Until about age 30, calcium accretion outpaces calcium loss, which results in increased bone density and growth. After age 30, however, the body gradually loses calcium, resulting in a gradual depletion of bone minerals.
- ◆ Heavy exercising hinders calcium's assimilation while moderate amounts of exercise improve its assimilation. Female athletes and menopausal women require increased amounts of calcium due to lower estrogen levels.<sup>1</sup> Estrogen aids the skeletal system by promoting the deposition of calcium in the bone.
- ◆ Taking too much calcium can interfere with the absorption of zinc, magnesium, and iron. Likewise high doses of magnesium, zinc, and iron can interfere with the absorption of calcium.<sup>1</sup>
- ◆ Because the body slowly absorbs calcium, calcium supplements are more effective if they are taken in small doses throughout the day and at bedtime. Another reason to take calcium at bedtime: calcium is useful in promoting a sound, restful sleep.<sup>1</sup>

## Functions:

- ◆ Calcium is essential for the formation of strong bones and teeth and for the maintenance of healthy gums. It increases the rate of bone growth and prevents against bone loss associated with osteoporosis.<sup>1</sup>
- ◆ Calcium is important in the maintenance of a regular heartbeat and transmission of nerve impulses. Calcium helps lower cholesterol levels and helps prevent against cardiovascular disease and certain forms of cancer including colorectal cancer.<sup>2</sup>
- ◆ Calcium is an important of normal blood clotting processes that aid in the early stages of wound healing. In addition, calcium also wards off the accumulation of an excess of acid or alkali in the blood.<sup>3</sup>
- ◆ It is involved in the activation of several enzymes including lipase, which breaks down fats for utilization by the body.<sup>1</sup> In addition, calcium maintains proper cell membrane permeability, aids in neuromuscular activity, and protects against pre-eclampsia in pregnancy, the number one cause of maternal death, according to *Prescription for Nutritional Healing* by James and Phyllis Balch.<sup>1</sup>

## Requirements:

The current Recommended Dietary Allowance (RDA) as established by the Food and Nutrition Board of the Institute of Medicine for children, adolescents, and adults is as follows:<sup>4</sup>

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Category and Age:	RDA (milligrams):
Infants 0 to 0.5 year	210 mg
0.5 to 1 year	270 mg
Children 1-3 years	500 mg
4-8 years	800 mg
9 -18 years	1,300 mg
Adults 19 to 50 years	1,000 mg
Adults 50+,	1,200 mg

### **Signs of Deficiency:**

A deficiency in calcium is associated with aching joints, eczema, brittle nails, elevated blood cholesterol, hypertension, heart palpitations, insomnia, muscle cramps, nervousness, rickets, tooth decay, rheumatoid arthritis, cognitive impairment, depression and, in severe cases, convulsions and delusions.<sup>1,2</sup>

### **Safety:**

Individuals who suffer from recurrent kidney stones, have kidney disease, cancer, hyperparathyroidism or who take calcium channel-blocking medication should consult a physician or health care professional before taking a calcium product.<sup>2</sup>

### **Signs of Toxicity:**

Calcium intakes of several grams per day combined with vitamin D may result in calcium deposition in soft tissue. High doses of calcium can impair absorption of other minerals including iron, magnesium and zinc.

### **Current Research:**

**Arthritis:** According to the *Nutrition Almanac*, “Arthritis, structural rigidity often caused by depletion of bone calcium, can be helped with regular supplements of calcium. Early consumption of calcium may help prevent arthritis. Rheumatism can also be helped with calcium therapy.”<sup>3</sup>

**Blood Pressure:** Calcium supplementation can lower hypertension. Researchers at Cornell University Medical School studied 26 hypertensive adults and administered 2,000 mg of calcium. After six months, researchers found a “modest but consistent” drop in blood pressure—from an average of 164/91 at the beginning of the study to 154/89 at the study’s conclusion.<sup>4</sup>



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Cancer: Researchers at Memorial Sloan-Kettering Cancer Center and Cornell University Medical College in New York found that when they gave 1,250 mg of calcium to individuals with a high familial history of colon cancer, calcium reduced excessive cell duplication, which is often found in people susceptible to developing colon cancer. Before calcium supplementation, researchers found that cell proliferation was what they would expect in people prone to colon cancer. However, after two to three months on the calcium regimen, cell duplication, or proliferation, was lower, nearly comparable to that of people with a lower risk of colon cancer. The researchers theorized that calcium binds the bile and fatty acids, thereby reducing the irritation it can cause to the lining of the colon, which would decrease cell proliferation and, thus, colon cancer.<sup>4</sup>

Osteoporosis: Research shows that increasing calcium for children, adolescents, young adults, middle-aged women can increase bone density. In fact, two studies show that other micronutrients such as trace elements are needed for proper bone metabolism and resorption. In one study, a group of post-menopausal women were given a combined trace element and calcium supplement, a calcium supplement or placebo. In the group receiving the combined trace element and calcium supplement, bone density *increased* 1.48 percent. In the group receiving only the calcium supplement, bone density decreased with an average of 1.25 percent. For the placebo group, bone density decreased 3.53 percent.<sup>5,6</sup> In the second study, post-menopausal women on HRT were given a multi-vitamin, multi-mineral supplement containing 500 mg. of calcium, 600 mg. of magnesium, 2 mg. of copper and 10 mg. of manganese. Control subjects receiving the supplement experienced an increase in bone density from 0.303 g/cm<sup>2</sup> to 0.337g/cm<sup>2</sup>.<sup>7,8</sup>

Premenstrual Syndrome: Calcium may reduce symptoms of PMS. A multi-center, placebo-controlled study reported that those taking calcium reported a 54 percent reduction in aches and pains versus a 15 percent *increase* in pains in the placebo group. Researchers have speculated that women with PMS may have hypocalcemia (low calcium despite normal blood and urine levels of calcium) due to high levels of parathyroid hormone that leech calcium from the bones.<sup>8</sup>

Weight Loss: Increasing dietary intake of calcium may aid weight loss. One group of researchers recently reported that obese patients who increased calcium intake for one year had a 4.9 kilogram loss of body fat. These researchers concluded, "Increasing dietary calcium suppresses adipocyte intracellular calcium and thereby modulates energy metabolism and attenuates obesity risk." Similar studies have shown that calcium inhibits lipogenesis (the production or deposition of fat).<sup>8</sup>

### References:

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