

## Calcium

### AT A GLANCE

#### Introduction

Calcium (Ca) is the most common mineral in the human body.

More than 99% of total body calcium is stored in the bones and teeth; the remaining 1% is found throughout the body in blood, muscle, and the fluid between cells.

#### Health Functions

A sufficient intake of calcium is important as it helps the body to

- provide sufficient calcium to build and maintain healthy bones and teeth
- maintain blood calcium levels in a constant and vital range
- allow calcium sensitive cellular processes in tissues to function properly like muscle, heart and other tissues
- mediate blood vessel function and nerve impulse transmission
- absorb calcium and use other micronutrients such as vitamin D, vitamin K, magnesium, and phosphorous

The European Food Safety Authority (EFSA), which provides scientific advice to assist policy makers, has confirmed that clear health benefits have been established for the dietary intake of calcium in contributing to:

- the maintenance of normal bones and teeth;
- normal muscle function and neurotransmission;
- normal blood clotting;
- normal energy metabolism;
- the normal function of digestive enzymes.

#### Disease Risk Reduction

##### **Colon cancer**

Although not all studies agree, some show that people who consume higher amounts of calcium and vitamin D in their diets are less likely to develop colorectal cancer than those who consume low amounts of the same nutrient.

##### **Osteoporosis**

Calcium is necessary to help build and maintain healthy bones and strong teeth.

Studies have shown that calcium, particularly in combination with vitamin D, can help prevent bone loss associated with menopause, as well as the bone loss experienced by older men.

### **Kidney stones**

The cause of kidney stones is unknown. However, abnormally elevated urinary calcium increases the risk of developing calcium stones.

Further controlled trials are necessary to determine whether supplemental calcium affects the development of kidney stones.

### **Pregnancy-induced high blood pressure**

Some studies suggest that calcium supplementation may play a role in the prevention of pregnancy-induced high blood pressure and preeclampsia. However, not all studies show the same benefit.

A prenatal vitamin supplement, which provides magnesium, vitamin B9 (folic acid), and many other nutrients, together with adequate calcium intake through the diet, may lower the risk of developing high blood pressure during pregnancy.

### **Stroke**

In a population study, women who took in more calcium, both through their diet and with supplements, were less likely to have a stroke over a 14-year period. However, other studies raised concerns for increasing the risk for cardiovascular diseases. A most recent meta-analysis including 63'563 postmenopausal women showed no evidence for increased coronary artery disease and all-cause mortality with calcium supplements.

More studies are needed to confirm potential beneficial effects of calcium supplements in preventing stroke\*.

### **Other Applications**

*Please note:*

*Any dietary or drug treatment with high-dosed micronutrients needs medical supervision.*

### **High blood pressure**

People who do not get enough calcium may be at higher risk of elevated blood pressure (hypertension), and there is some mixed evidence that suggests increasing calcium levels may lower blood pressure slightly.

Not all studies have found this benefit; and researchers are not sure whether it is the effects of a diet that includes low-fat dairy products (which contain calcium) that is responsible.

More studies are needed before calcium supplements can be recommended for the treatment of hypertension in addition to standard blood pressure medication.

### **Premenstrual syndrome (PMS)**

One large study showed that women who took 1,200 mg of calcium per day reduced their symptoms of PMS, such as headache, moodiness, food cravings, and bloating, by 50%.

A smaller study suggested that calcium may help reduce menstrual pain.

## Intake Recommendations

European health authorities recommend an intake 1,000 mg calcium per day for adults, in the U.S. an intake level of 1,000 to 1,200 mg/day has been defined as adequate.

## Supply Situation

According to national surveys in Europe and the U.S., many people consume less than half the amount of calcium recommended to build and maintain healthy bones.

## Deficiency

It is especially important to get enough calcium as you age.

Postmenopausal women, people who consume large amounts of caffeine, alcohol, or soda, and those who take corticosteroid medications may be at risk of calcium deficiency.

In addition, calcium deficiency can be found in people with malabsorption problems, such as Crohn's disease, celiac disease, and surgical intestinal resection.

A long-lasting low calcium intake in growing individuals may prevent the attainment of optimal peak bone mass. Once peak bone mass is achieved, inadequate calcium intake may contribute to accelerated bone loss and ultimately to the development of osteoporosis.

## Sources

The richest dietary sources of calcium include cheeses (such as parmesan, Romano, gruyere, cheddar, mozzarella, and feta), low-fat dairy products (milk, yogurt), tofu, and blackstrap molasses.

Some other good sources of calcium include almonds, brewer's yeast, broccoli, cabbage, dried figs, kelp, dark leafy greens (dandelion, turnip, collard, mustard, kale, Swiss chard), hazelnuts, oysters, sardines, and canned salmon.

Foods that are fortified with calcium, such as juices, soy milk, rice milk, tofu and cereals, are also sources of this mineral.

## Safety

Abnormally elevated blood calcium ('hypercalcemia') has been reported only with the consumption of large quantities of calcium supplements (1.5 to 16.5 grams/day).

Mild hypercalcemia may be without symptoms or may result in loss of appetite, nausea, and vomiting, while more severe hypercalcemia may result in confusion, delirium, coma, and if not treated, death.

Although the risk of forming kidney stones is increased in individuals with abnormally elevated urinary calcium, this condition is not usually related to calcium intake, but rather to increased excretion of calcium by the kidneys.

Some population studies have raised concern that high calcium intakes are associated with increased risk of prostate cancer, while other studies have not shown such a relationship. Until the relationship between calcium and prostate cancer is clarified, it is reasonable for men to consume the recommended adequate intake level of a total of 1,000 to 1,200 mg/day calcium.

### **Tolerable upper intake level**

Health authorities in Europe and the U.S. have set the tolerable upper intake level for calcium intake in adults at 2,500 mg/day. This intake level applies also to pregnant and breast-feeding women.

### **Drug interactions**

*Please note:*

*Because of the potential for interactions, dietary supplements should not be taken with medication without first talking to an experienced healthcare provider.*

Authored by Dr Peter Engel in 2010, reviewed and updated by Dr Igor Bendik-Falconnier on 12.10.17.