



# THE CALCIUM STORY

## ESSENTIAL TO BONES AND MUCH MORE

Calcium is the most abundant mineral in the human body, making up about 2% of body weight, and participating in the functions of virtually all cells and tissues. Ninety-nine percent of the body's calcium is present in the bones and teeth, to which it gives strength and structure. The remaining 1% of the body's calcium is widely distributed in our tissues and bodily fluids. The vital role of this small amount of calcium is reflected in the precise control of calcium in the blood which always remains within a very narrow range that is regulated by hormones.

This circulating calcium is essential for normal muscle contraction and relaxation, regulation of the heart beat, nerve functioning, blood clotting, secretion of hormones, and the activation of a number of enzymes, including lipase, which is needed to break down dietary fats.

The calcium stored in bones acts as a "reserve" of calcium to the circulation so that blood levels of the mineral can be kept constant at all times. It is estimated that in an adult man about 700 mg of calcium enters and leaves the bones each day in this cycle of calcium "deposits" and "withdrawals."

Calcium must be supplied to the body through diet. However, only 20-30% of calcium in the average diet is absorbed from the intestinal tract and taken into the bloodstream.

## MOST LIKELY TO BE LACKING IN THE DIET

The richest food sources of calcium are dairy products such as cheese, yogurt, ice cream, and milk, greens including collards and kale, almonds, flour, fish, tofu, and egg yolks. In the U.S., 75% of the calcium consumed is in the form of dairy products. Of the nutrients that must be provided by the foods we eat, calcium is most likely to be lacking.

## DIETARY FACTORS CAN ENHANCE CALCIUM ABSORPTION

The following dietary factors may increase the absorption of calcium:

- **Vitamin D.** One of the most important factors affecting calcium absorption is an adequate supply of vitamin D, whether from diet or exposure to sunlight.
- **Acid medium.** Absorption of calcium is favored by an acid environment (a lower pH) in the digestive tract. Stomach acidity is essential to "ionize" or digest calcium. It is also important to help keep calcium in solution until it is absorbed. Most calcium absorption occurs in the upper small intestine which is more acidic than the lower small intestine.
- **Protein.** Dietary protein increases the rate of calcium absorption from the small intestine when the amino acid building blocks of proteins combine with calcium to form calcium chelates which are easily absorbed.

## OSTEOPOROSIS: WHEN CALCIUM NEEDS ARE GREATER THAN DIETARY SUPPLIES

The body builds bone mass throughout infancy, childhood, and young adulthood. In order to achieve maximum bone density, the body must have a calcium intake high enough to maintain the structure of the bones as well as to supply all of the additional needs for calcium in the body. It is believed that peak bone mass is reached around the age of 25.

The National Institutes of Health recommends that Americans consume more calcium than they do now in order to build and maintain healthy bones.

### SUGGESTED DAILY INTAKE

Age Group	Calcium (milligrams)
<b>INFANTS</b>	
Birth-6 mos.	400
6 mos.-1 year	600
<b>CHILDREN</b>	
1-5 years	800
6-10 years	800-1,200
<b>ADOLESCENTS — YOUNG ADULTS</b>	
11-24 years	1,200-1,500
<b>MEN</b>	
25-65 years	1,000
over 65 years	1,500
<b>WOMEN</b>	
25-50 years	1000
Pregnant or nursing	1,200-1,500
After menopause, 50-65 years	
On estrogen	1,000
Not on estrogen	1,500
Over 65 years	1,500

## WHO IS AT RISK FOR OSTEOPOROSIS

Bone mass begins to slowly decline after the age of 50. This decline is not debilitating when bone stores are adequate. However, *an inadequate calcium intake throughout the first two or three decades of life can leave an individual at serious risk for developing osteoporosis*, a crippling disease that is marked by a gradual but severe loss of bone mineral. As a result, the bones become more fragile and susceptible to injury and fracture:

- Because the rate of bone loss is particularly marked after menopause, mainly because of a sharp reduction in estrogen, osteoporosis is more common in women in their middle and later years than heart attacks, strokes, diabetes, or rheumatoid arthritis.



- The risk of a woman developing osteoporosis is greater than the combined likelihood of her getting breast, uterine, and ovarian cancers.
- American men over 50 have a greater chance of suffering an osteoporosis-related fracture than of developing clinical prostate cancer. One out of 8 men over 50 will break a bone due to osteoporosis.
- Each year, 1.5 million bone fractures are attributable to osteoporosis. Of these, 100,000 men and 150,000 women suffer hip fractures. A third of them die within a year, usually because of complications such as blood clots in the lung or pneumonia.
- By the age of 65 or 70, men and women lose bone mass at the same rate. Calcium absorption also decreases in both sexes with advancing age.
- Other factors associated with increased risk of osteoporosis are tobacco smoke and excessive consumption of alcohol and caffeine.
- Significant bone loss can result from prolonged exposure to steroidal drugs (such as prednisone), from anticonvulsant medications, from aluminum-containing antacids, and some cancer drugs.

## CALCIUM, VITAMIN D, AND OSTEOPOROSIS

The body needs vitamin D in order to absorb and utilize calcium from the diet. However, as people age, the amount of vitamin D made in the skin after exposure to sunlight declines, and the body loses some of its ability to convert vitamin D into the active hormone needed for proper calcium metabolism.

According to the *American Journal of Clinical Nutrition*, there is a “silent epidemic” of vitamin D deficiency in the elderly in the U.S., and this increases the risk of skeletal fractures. What’s more, use of heavy sunscreens — as a precaution against premature aging and increased risk of skin cancer — also decreases the ability of the body to produce sufficient vitamin D. In fact, the Osteoporosis Society of Canada has recommended that elderly people and those who use heavy sunscreens should have a dietary intake of 400 to 800 IU of vitamin D per day.

## DIETARY CALCIUM AND OSTEOPOROSIS PREVENTION

The role of dietary calcium in reducing the risk or delaying the onset of osteoporosis is now well-recognized. Because bone loss accompanies the aging process, sufficient calcium intakes during early adulthood increase peak bone mass, thereby reducing the risk of osteoporosis decades later. In fact, calculations compiled by researchers at a major osteoporosis center suggest that a 5% increase in peak bone density early in life can result in a 50% reduction in the risk of fractures from bone loss later in life.

According to researchers in New Zealand, calcium supplementation can slow postmenopausal bone loss by 30-50%. Another study in Belgium showed that calcium and vitamin D supplementation reduced nonvertebral fractures in elderly subjects by up to 40% over an 18-month period.

And numerous studies have shown that increased calcium intake, together with weight-bearing exercise, can actually build bone, even late in life.

Other studies suggest that it’s never too early to benefit from increased calcium intake: In one study of adolescent girls, significant increases in bone density were seen in girls who received calcium supplements for 18 months. Researchers for the U.S. Department of Agriculture say that “the primary prevention of osteoporosis begins before puberty.” Studies now suggest that girls should boost their calcium intake beginning at about age five, since peak bone formation may begin — and end — earlier than previously believed.

At least 14 intervention studies have established the skeletal benefits of increased calcium intake during growth and among women in late postmenopause.

## CALCIUM AND BLOOD PRESSURE

High blood pressure, one of the most common chronic diseases in industrialized societies, is a primary risk factor for cardiovascular disease, heart failure, kidney disease, and stroke. Data from both population studies and clinical trials have shown that calcium metabolism may be altered in people with hypertension.

More than 80 studies have reported lowered blood pressure after dietary calcium supplementation in experimental models of hypertension. One study of people with mild (stage 1) hypertension found that those consuming a low-fat diet rich in fruits, vegetables, and calcium enjoyed an average drop in systolic blood pressure of 11 points, and diastolic pressures fell an average of six points, which may be as good or better than reductions achieved with medication. Regardless, calcium supplementation is not advised as a substitute for prescribed hypertension medication.

Calcium status is particularly important during pregnancy, and studies have shown that calcium supplementation may lower blood pressure and prevent preeclampsia (high blood pressure or tissue swelling during, or as a result of, pregnancy). A review of six studies showed that calcium supplementation during pregnancy cut the risk of pregnancy-induced hypertension by half. There were also indications of other favorable benefits of calcium supplementation, including reduced risk of premature delivery. Calcium supplementation may be important to pregnant women for other reasons as well: insufficient calcium supply during pregnancy and breast-feeding could result in maternal bone loss, reduced calcium levels in breast-milk, or impaired infant bone development.

## GNLD DELIVERS CALCIUM

### IN COMPLETE BONE-BUILDING FORMULAS

GNLD always looks first to nature for raw materials that are high in purity and compatible with the body’s natural processes. For this reason, GNLD’s Chelated Cal-Mag utilizes calcium carbonate from seashells. Highly soluble, calcium carbonate is readily absorbed.

For additional potency and purity, GNLD offers



pharmaceutical-grade calcium, present with seashell calcium in Neo-Cal or Vitality Calcium Plus. The different high-quality sources of calcium allow us to achieve different formulation goals: maximum absorption with Chelated Cal-Mag, ideal for the person who eats calcium-rich foods but wants extra calcium as “dietary insurance,” and high potency with Neo-Cal and Vitality Calcium Plus, ideal for people who might otherwise consume very little calcium in their diets.

The amount of supplemental calcium a person needs each day depends greatly upon a number of factors including diet, age, nutritional preferences, and even genetic background. Because GNLD is aware of these differences, we offer a choice of four different calcium product formulations, each with unique advantages, to fulfill everyone’s supplemental calcium needs.

### NEO-CAL

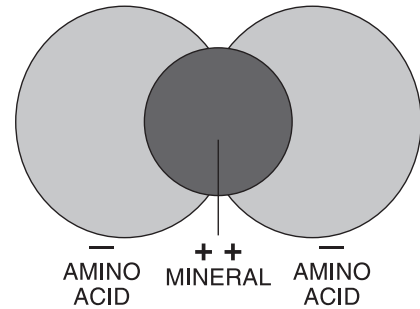
Neo-Cal is a fresh-tasting, mint flavored, chewable tablet the whole family will enjoy. It blends calcium carbonate with calcium lactate and calcium gluconate-high-purity calcium complexed to organic acids for better absorption-for maximum utilization in the body. In addition, Neo-Cal contains natural beet root, a source of betaine hydrochloride, which helps digest calcium and maintain normal acidity in the stomach. Magnesium and vitamin C have also been added to enhance calcium absorption and utilization. Mint oil and carob create the refreshing flavor of Neo-Cal.

### CHELATED CAL-MAG

Cal-Mag provides GNLD’s unique amino-acid-chelated calcium to improve absorption in a 2-to-1 ratio with magnesium, a mineral which

plays important roles in numerous enzyme systems and in regulating the cardiovascular system and muscle contraction. Cal-Mag is available

in two forms: a tablet which provides 100 mg of calcium and 50 mg of magnesium, and a capsule of the same potency with vitamin D added for those people who don’t receive enough of this vitamin in their diet.



**Vitality Calcium Plus  
has been discontinued.**