



CALCIUM & MAGNESIUM

The human body is composed of approximately forty main elements such as oxygen, carbon, hydrogen, and nitrogen. Calcium and other metals in lessening order of quantity make up the balance.

Calcium:

Calcium exists in every part of the living body and plays a vital role in the function of the body. It is involved in many capacities, such as the formation of bone and teeth, white blood corpuscles activity, cell division, electric stimulation, hormone secretion and transmission of information. The amount of calcium in the body varies between .5 to 2.0% of body weight.

99% of Calcium is distributed in bones and teeth (skeletal). The remaining 1% is considered plasma or ionic Calcium. The living body excretes daily 300 to 600 mg of ingested calcium as well as blood calcium. The body must replenish what is lost. If the body cannot replenish itself, a hormone (parathyroid or PTH) kicks in to move calcium from the skeletal into the blood and cells to maintain blood pH or homeostasis. If this activity lasts too long, bone deterioration and illness can ensue (Osteoporosis).

The minimum daily requirement of Calcium is only 1 gram. However, Calcium directly affects a number of bodily functions, such as maintaining skeletal structure and cell activity. Existing Calcium levels and its balance in the body determines: dosage, speed and distribution of ingested Calcium. These three factors dictate the overall effectiveness of the ingested calcium and its benefit or lack thereof on cellular function.

Critical in the balancing act are other elements such as Magnesium, Potassium, Sodium, Phosphorous and a host of hormones that work in synergy to complement each other in the creation of a healthy body. It is a recognized fact that a daily supply of absorbable Ionic Calcium is necessary to maintain Calcium balance in the body.

Food is one source, however deficiencies in modern agricultural process have all but robbed all sources of minerals from this source. Calcium supplementation has become a necessary factor in daily life, having said that, all calcium supplements are not the same.

Calcium is generally known to exist as Calcium Salt as it bonds with oxidizing compounds such as acids, carbonates, phosphates, lactates, Gluconate, citrates, and others. Basic daily intake should be app: 600 milligrams understanding that 70 to 90% of the ingested Calcium is excreted.

Proper Calcium supplementation is determined by its solubility, ability to separate, speed of absorption, degree of pollution, Phosphate content and its degree of ionic exchange.

Currently, Calcium is ingested, and it is then dissolved and dissociated chemically in the stomach where a Calcium ion is created for absorption in the body. It is this factor alone which determines absorption rate of Calcium.



When Nano-Cal is dispersed in solution, it is ionized prior to consumption, thus bio-available

Magnesium

Our diets and lifestyles are very different from our ancestors. Living in a modern industrialized country food is processed (depletes mineral content by 80%). Drinking water is softened (bottled water is usually very mineral deficient). Beverages are made from de-ionized water (often loaded with phosphates). Soil for our fruits and vegetables are lower in magnesium than 75 years ago.

We also get less physical exercise and deal with more day-to-day stress. For these reasons, chances are very high, (over 95%), that one does not get enough magnesium from diet.

As a result, nearly everyone in the U.S. is magnesium deficient to an alarmingly high degree. Over the years even a relatively small shortfall in magnesium will gradually contribute to serious health problems. In males, it will most likely be reflected in heart problems. In female, hormones often protect the heart until menopause. However, since pre-menopausal women are subject to many other maladies related to magnesium deficiency, females also benefit from magnesium supplementation.

Magnesium is a common factor in over 300 enzymes. It assists in controlling sugar, protein, fat metabolism, cell structure maintenance, secretion, contraction and nerve function.

While Calcium controls contractions of heart muscle and vein cells, Magnesium controls the transport of calcium in and around the membranes of these cells.

Epidemiology studies and animal testing have confirmed that Magnesium deficiencies were as influential as Calcium deficiencies in high blood pressure and heart disease.

Role of Magnesium:

- Controls the amount of Calcium flowing into cells.
- Lowers Sodium density in cells.
- Decreases density of isolated calcium ions in cells
- Magnesium in cell promotes excretion of Calcium from cells
- Without sufficient magnesium the body loses its capacity to move potassium from the liver into the cells where it plays very important roles in the maintenance of good health.
- Magnesium is also needed to shift calcium into and out of cells. Cells require a small amount of calcium, however too much calcium is a problem. Magnesium serves to regulate these essential cellular minerals.

Magnesium deficiency plays several critical roles in the maintenance of a healthy heart. Heart muscle cells require magnesium as do smooth muscle cells and elastica in coronary arteries.

Improper cellular balance can lead to high blood pressure. Often improper levels of the parathyroid hormone can indicate improper cellular balance. Supplementing calcium-magnesium in the appropriate ratio can help maintain cellular balance, by controlling parathyroid hormone (PTH). The parathyroid hormone secretions maintain cellular balance by helping maintain appropriate levels of calcium in the bloodstream.



"PTH secretion is inversely related to the ambient concentration of ionized calcium. Serum PTH declines in a rectilinear fashion in relation to serum calcium levels between 7.5 mg/dl and 10.5 mg/dl." ¹

This means the level of calcium in the bloodstream regulates PTH. The amount of PTH in the bloodstream helps regulate normal extra cellular fluid calcium. Magnesium is a cofactor in this cell regulation process.

A laboratory can test your PTH levels. If they are not normal consider appropriate supplementation ideas.

Sometimes high doses of calcium-magnesium are needed to help control PTH levels.

Consult with an ortho-molecular doctor for proper supplementation in these cases. Calcium levels in the blood stream must be regulated in order to regulate calcium and Magnesium levels inside the cells. Restoring calcium balance inside and outside cells can help correct PTH levels and in some cases lead to reduced blood pressure.

¹ (Ref. Robert K. Murray, MD, Ph.D., Daryl K. Granmer, MD, Peter A. Mayes, Ph.D., D.Sc., Victor W. Fodwell, Ph.D., Harper's Biochemistry, twenty-fifth edition. Appleton & Lance, Stanford, Connecticut, 2000, page 570.)