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AQUACAL tablets: A Natural Plant based bioactive elemental calcium with 72 trace minerals in marine mineral complex

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ABSTRACT

Aquamin, is a natural, multimineral derived from the red algae *Lithothamnion corallioides*, rich in calcium, magnesium and 72 other trace minerals. Aquamin promotes increased mineralisation in osteoblast cell culture. Aquamin plays an important role in promoting bone formation and may be useful in treating bone diseases such as osteoporosis. Aquamin directly enhances osteogenesis by providing not only an extra source of calcium but also other essential bone supporting minerals necessary for the mineralisation of extracellular matrix deposited by these cells. Calcium is the most common mineral in the human body. About 99% of the calcium in the body is found in bones and teeth, while the other 1% is found in the blood and soft tissue. Calcium levels in the blood and fluid surrounding the cells (extracellular fluid) must be maintained within a very narrow concentration range for normal physiological functioning. The physiological functions of calcium are so vital to survival that the body will demineralize bone to maintain normal blood calcium levels when calcium intake is inadequate. Thus, adequate dietary calcium is a critical factor in maintaining a healthy skeleton. This review summarises the current available scientific literature regarding the effect of Aquacal tablets, A Natural calcium Supplement in supporting optimal bone Health.

Keywords: Aquacal tablets, Natural calcium Supplement, optimal bone Health.

INTRODUCTION

WHY CALCIUM?

Calcium Deficiency can lead to:

- Brittle or weak bones
- Bone fracture
- Osteoporosis
- Weakness or Fatigue
- Delay In children's growth and development

Recommended dosage of daily Calcium

Group	Calcium(mg/d)
Men	600
Women	600
Boys +girls above 10 years	800

Calcium obtained from regular diet is approximately 400mg/day or lesser. Reference: Nutrient Requirements and Recommended Dietary Allowances For Indians, ICMR.

Calcium is a major structural element in bones and teeth. The mineral component of bone consists mainly of hydroxyapatite crystals, which contain large amounts of calcium and phosphorus (about 40% calcium and 60% phosphorus). Bone is a dynamic tissue that is remodeled throughout life. Bone cells called osteoclasts begin the process of remodeling by dissolving or resorbing bone. Bone-forming cells called osteoblasts then synthesize new bone to replace the bone that was resorbed. During normal growth, bone formation exceeds bone resorption. Osteoporosis may result when bone resorption exceeds formation.

Cell signaling

Calcium plays a role in mediating the constriction and relaxation of blood vessels (vasoconstriction and vasodilation), nerve impulse transmission, muscle contraction, and the secretion of hormones, such as insulin. Excitable cells, such as skeletal muscle and nerve cells, contain voltage-dependent calcium channels in their cell membranes that allow for rapid changes in calcium concentrations. For example, when a muscle fiber receives a nerve impulse that stimulates it to contract, calcium channels in the cell membrane open to allow a few calcium ions into the muscle cell. These calcium ions bind to activator proteins within the cell that release a flood of calcium ions from storage vesicles inside the cell. The binding of calcium to the protein, troponin-c, initiates a series of steps that lead to muscle contraction. The binding of calcium to the protein, calmodulin, activates enzymes that breakdown muscle glycogen to provide energy for muscle contraction.

Cofactor for enzymes and proteins

Calcium is necessary to stabilize or allow for optimal activity of a number of proteins and enzymes. The binding of calcium ions is required for the activation of the seven "vitamin K-dependent" clotting factors in the coagulation cascade. The term, "coagulation cascade," refers to a series of events,

each dependent on the other that stops bleeding through clot formation.

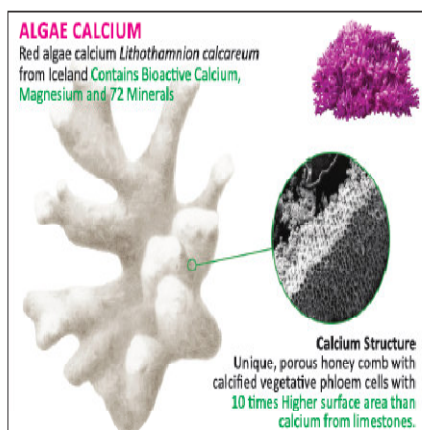
Regulation of calcium levels

Calcium concentrations in the blood and fluid that surrounds cells are tightly controlled in order to preserve normal physiological functioning (diagram). When blood calcium decreases (e.g., in the case of inadequate calcium intake), calcium-sensing proteins in the parathyroid glands send signals resulting in the secretion of parathyroid hormone (PTH). PTH stimulates the conversion of vitamin D to its active form, calcitriol, in the kidneys. Calcitriol increases the absorption of calcium from the small intestine. Together with PTH, calcitriol stimulates the release of calcium from bone by activating osteoclasts (bone resorbing cells), and decreases the urinary excretion of calcium by increasing its reabsorption in the kidneys. When blood calcium rises to normal levels, the parathyroid glands stop secreting PTH and the kidneys begin to excrete any excess calcium in the urine. Although this complex system allows for rapid and tight control of blood calcium levels, it does so at the expense of the skeleton.

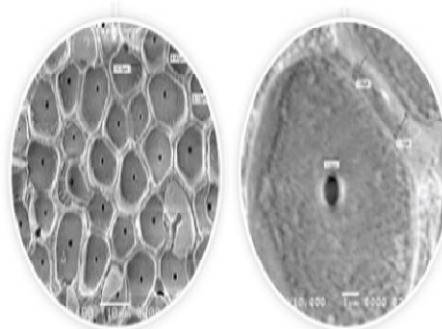
DEFICIENCY

A low blood calcium level usually implies abnormal parathyroid function, and is rarely due to low dietary calcium intake since the skeleton provides a large reserve of calcium for maintaining normal blood levels. Other causes of abnormally low blood calcium levels include chronic kidney failure, vitamin D deficiency, and low blood magnesium levels that occur mainly in cases of severe alcoholism. Magnesium deficiency results in a decrease in the responsiveness of osteoclasts to PTH. A chronically 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 the development of osteoporosis.

AQUACAL tablets: A Plant based bioactive elemental calcium with marine mineral complex



PHYSICAL DIFFERENCE-THE STRUCTURE



Aquamin is a plant

Limestone is Rock

COMPOSITION OF AQUACAL TABLETS

Each Coated tablet contains-

Calcium as Aquamin TG	---400mg
Ergocalciferol	-----400 IU
Magnesium	-----12.85 mg
Copper	-----1 mg
Zinc	-----10 mg
Manganese	-----2.5 mg

It is a marine plant multi-mineral complex Supplements are used as an aid in the prevention of osteopenia and osteoporosis

MAGNESIUM, COPPER, ZINC AND MANGANESE

- ▶ Helps in Rheumatoid arthritis Fractures and Hypokalemia
- ▶ Zinc and Manganese Corrects deficiencies directly effecting against osteoplastic activity
- ▶ Important for the integral tissue proteins and gene expression regulation
- ▶ Corrects Vitamin D Deficiency in the body Increases calcium absorption in the intestine
- ▶ Promotes Bone Density.

CHOLECALCIFEROL

- ▶ Helps in prolonged suppression of serum PTH concentrations in pre-menopausal women.
- ▶ Aquamin demonstrates greater influence over markers of calcium metabolism than calcium carbonate and placebo.
- ▶ Influencing biochemical bone turnover markers.
- ▶ Enhancing movement/physical activity by reducing symptoms associated with inflammation.
- ▶ And also for the treatment of patients when used along with medication.

Supplement Facts

Presentation: Tablets

INDICATIONS

- ▶ Fractures
- ▶ Rheumatoid Arthritis
- ▶ Vitamin D Deficiency
- ▶ Hypokalemia
- ▶ Osteopenia
- ▶ Osteoporosis

Usage:

- Helps to support optimal bone density.
- Helps to support bone matrix deposition & mineralization.
- Delivers highest level of efficacy with most bioavailable form.
- **Contra-indications:** Product is contra-indicated in persons with Known hypersensitivity to any component of the product hypersensitivity to any component of the product.
- **Recommended usage :** 1-2 tablets a day.
- "Do not exceed the recommended daily dose"
- **Administration:** Taken by oral route at anytime with food.
- **Precautions:** Do not exceed the recommended daily dose.
- **Warnings:** If you are taking any prescribed medication or has any medical conditions always consults doctor or healthcare practitioner before taking this supplement.
- **Side Effects:** Very mild side effects like nausea, headache and vomiting in some individuals may be observed.

CONCLUSION

Aquamin, is a natural, multimineral derived from the red algae *Lithothamnion corallioides*, rich in calcium, magnesium and 72 other trace minerals. Aquamin promotes increased mineralisation in osteoblast cell culture. Aquamin plays an important role in promoting bone formation and may be useful in treating bone diseases such as osteoporosis. Aquamin indirectly enhances osteogenesis by providing not only an extra source of calcium but also other essential bone supporting minerals necessary for the

mineralisation of extracellular matrix deposited by these cells.

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Conflicts of interest statement

The authors declare that there is no conflict of interest.

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