

Background/History

Mineral depletion and use of chemical additives (ie fertilizer) in soil utilized for food production has a detrimental impact on our health. Chemical based fertilizers inhibit uptake of boron and other nutrients from the soil and reduce the mineral content of our food supply. Combined with the fast food revolution and reduced quality of diet, boron intake has dropped drastically in the last 100 years. Boron is essential for integrity and function of cell walls, signal transmission across membranes, bone health and dental enamel making it an important nutrient for optimal health.

Boron is distributed in the body with highest concentrations in the parathyroid glands, bones, and dental enamel. Boron regulates absorption and metabolism of calcium, magnesium, and phosphorus. Boron deficiency leads to overactive parathyroids resulting in increases in parathyroid hormone which raises the blood level of calcium by releasing calcium from bones and teeth. This can lead to osteoarthritis, osteoporosis, and tooth decay. Higher blood levels of calcium leads to calcification of soft tissues and endocrine glands, arteriosclerosis, kidney stones and calcification of the kidneys which can eventually lead to kidney failure. A combined deficiency in boron and magnesium together can be extremely damaging to bones and teeth.

BoroTab is a new nutritional supplement developed by J. Charles Hakala, RPh and manufactured by Hakala Nutritionals for daily supplementation of boron and is currently available in tablet form in 30 mg or 75 mg strengths.

For ordering information and other information regarding supplementation of Boron as part of a whole body health nutritional program contact:



Hakala Nutritionals

883 Parfet St Suite C
Lakewood, CO 80215
303-763-6242
877-238-1779
www.hakalalabs.com

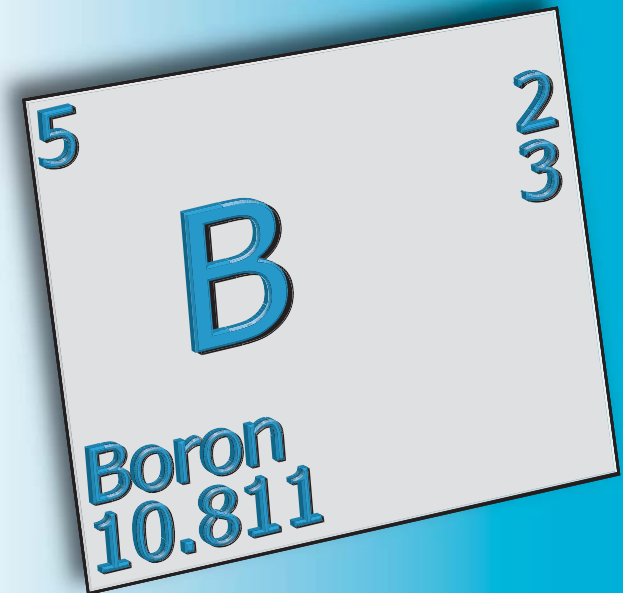
Potential side effects can occur with large intake of boron and may include skin inflammation, headaches, and other symptoms. Consult your healthcare provider before adding Boron supplementation to your daily regime.

Boron supplementation is not recommended for infants, nursing mothers, or pregnant women.

Visit hakalalabs.com or
Call 877-238-1779
For ordering information

BoroTab

Information and summary of studies related to various conditions helped by Boron supplementation



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Literature Review

Bones and Joints

Boron and Arthritis

Rex E Newnham, PhD, DO, ND. The Arthritis Trust of America Special Report 1994.

Abstract: A review article that looks at the demographic data related to boron intake and the incidence of arthritis in the population. In areas where boron intake is less than 1mg per day, such as Jamaica, the incidence of arthritis is 70% versus countries such as Israel with daily boron intake of 5-8 mg/day and arthritis rates of 1%. Interestingly in Ngawba, New Zealand where daily boron intake is >10mg daily there is no arthritis in the population. Suggests that at least 6 mg of boron daily is necessary for good health.

Histomorphometric study of alveolar bone healing in rats fed a boron deficient diet.

Anat Rec(Hoboken). 291(4): 441-7, 2008.

Abstract: The findings show that boron deficiency results in altered bone healing because of a marked reduction in osteogenesis. Two groups of rats were used, one fed a boron deficient diet and the other a diet containing boron at 3mg/kg of body weight.

Studies on the relationship between boron and magnesium which possibly affects the formation and maintenance of bones.

Magnes Trace Ele. 9(2): 61-9, 1990.

Abstract: Because Boron and/or Magnesium deprivation causes changes similar to those seen in women with postmenopausal osteoporosis, these elements are apparently needed for optimal calcium metabolism and are thus needed to prevent the excessive bone loss which often occurs in postmenopausal women and older men.

Boron and Arthritis: The Results of a Double-blind Pilot Study

Journal of Nutr Medicine. 1(2): 127-132, 1990.

Abstract: This study shows an improvement of 71% in osteoarthritis patients with daily supplementation of 6mg while showing no side effects.

The Role of Boron in Nutrition and Metabolism

Progress in Food and Nutrition Science. 17: 331-349, 1993.

Abstract: A review article showing the beneficial effects of boron on bone metabolism, osteoporosis, arthritis, heart disease and stroke, glucose related disorders and brain function.

Metabolism

The effect of boron supplementation on its urinary excretion and selected cardiovascular risk factors in healthy male subjects

Biol Trace Elem Res. 56(3): 273-286, 1997.

Abstract: After supplementation of boron, 84% was recovered in urine. Also plasma estradiol and testosterone levels were increased.

NaBC1 is a Ubiquitous Electrogenic Na⁺-Coupled Borate Transporter Essential for Cellular Boron Homeostasis and Cell Growth and Proliferation.

Molecular Cell, 16: 331-341, 2004.

Abstract: Shows that boron is an essential micronutrient due to the presence of the borate transporter in NaBC1

Borate Transport and Cell Growth and Proliferation

Cell Cycle 4(1): 24-26, 2005.

Abstract: Na⁺-coupled borate transporter essential for cell growth and proliferation opens the way to probe the roles of boron in cellular function and physiology.

Dietary Boron, Brain Function and Cognitive Performance

EnvironHealthPerspect. 102(Supp7): 65-72, 1994.

Abstract: Collectively, the data from these three studies indicate that boron may play a role in human brain function and cognitive performance, and provide additional evidence that boron is an essential nutrient for humans.

Cellular changes in boric acid-treated DU-145 prostate cancer cells

British Jour of Cancer. 94: 884-890, 2006.

Abstract: Epidemiological, animal, and cell culture studies have identified boron as a chemopreventive agent in prostate cancer.

Dietary boron intake and prostate cancer risk

Oncology Reports. 11:4, 2004

Abstract: Increased dietary boron intake was associated with a decreased risk of prostate cancer with a dose-response pattern.

Effects of dietary boron on mineral, estrogen and testosterone metabolism in postmenopausal Women.

Presented by Forrest Nielsen to the 1987 Joint Meeting of the Minnesota and North Dakota Academies of Science, Moorhead, MN, April 24, 1987.

Abstract: Supplementation with boron induces changes in postmenopausal women consistent with the prevention of calcium loss and bone demineralization.

Toxicity

Elemental boron and borates are considered non-toxic to humans and animals, with a toxicity similar to table salt. The LD50 for animals is approximately 6 grams/Kg of body weight. Boron is more toxic in infants and should not be used during pregnancy.