

Too many people suffer from arthritis and joint replacements, mostly caused by a lack of boron.

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Boron is neither a metal nor a nonmetal, it is a metalloid or a semimetal. Boron plays a role in the synthesis of oestrogen, vitamin D, and other steroidal hormones and protects some from rapid breakdown. In addition, boron strengthens the connective structure in bones.

Boron nutritionally promotes the proper utilisation of many vitamins, minerals, and hormones, which are crucial to the optimal functioning of the body.

Take one with each meal.

Buy from Chris Rhodes or search for Boron (Glycinate), 60 Capsules, Pure Encapsulations.

Boron plays a crucial role in your body's metabolism. And it's key to the growth and maintenance of bones. It's also essential for:

- Wound healing;
- Brain function;
- Protection against oxidative stress and heavy-metal toxicity;
- Reducing inflammation;
- Maintaining healthy levels of antioxidants;
- Protecting against certain cancers, including prostate and lung cancers.

Boron also increases bioavailability of testosterone.

A recent study gave 13 men 6 mg of boron for two months. And at the end of the trial, their free testosterone levels had increased by 29.5%.

A study found after only one week of boron supplementation, men saw their:

- Free testosterone levels increase by 28%;
- Free oestrogen levels had decrease by 39%.

I always recommend getting minerals like boron from your diet like Coconut oil from Philippines which are very high in B and selenium, and I always start with organic foods that have the highest levels:

- Avocados. In New Zealand most avocados grown are exported and by law all have to be sprayed against insects, so we don't eat them.
- Apricots;
- Apples;
- Legumes like red kidney beans;
- Almonds;
- Raisins.

But, even if you ate a variety of these foods daily, it's still tough to get enough boron. As a minimum, I recommend 3 mg daily — and you'd need to eat six apples a day to hit that mark. That's why I suggest you take Pure Boron capsules.

Auriel and I suffered joint problems in the 1960s. Hers was general joint stiffness and mine was clicking knees, so we each took one Borex (Boron) a day, an excellent product which was taken off the market in the 1970s. There was opposition to using Borex for arthritis prevention by some medical organisations to protect their businesses by opposing preventative products and systems. Other brands were not as good so were ignored.

Our joint problems recurred so we took more with organic coconut oil from the Philippines which is high in natural boron and selenium, thanks to their high soil levels. We have always fertilised our two farms and vegetables with boron, now with OrganiBOR, a slow release boron from reputable fertiliser companies to ensure that we get what we order. Comparative trials showed it to be the best by far. If your fertiliser supplier has not got OrganiBOR encourage them to contact the importer Rick Jamieson, OrganiBOR is organically certified, Biogro number 5063.

We take one Pure Boron glycinate encapsulations with each meal as recommended and sold by Chris Rhodes which is the best by far of the six I have had analysed over five years. It has only 1 ppm of mercury which is not much in a 2 mg capsule. Some had between 15 and 30 ppm of mercury and other heavy metals. Google for 'Pure Boron glycinate encapsulations' and you'll see that it is the most popular by far, and can be purchased from Rhodes or on the Net.

My last blood test showed B to be just above the optimum. You must allow for the food you are eating before taking supplements. We now eat 12 home grown vegetables fertilised with Lime Nutrient Planner and Phosphate Nutrient Planner fertiliser spreadsheet mixes, both my formulas based on the Pasture Analysis spreadsheet containing boron.

When people from the Philippines come to New Zealand, they feel sluggish and unwell, but feel better again when back in the Philippines. Some have reported having tummy aches from milk in New Zealand. The Philippines is a non-cattle country of 7,000 islands, so the nation had not had or adapted to milk over the centuries. It is a possible that Lewis milk is OK. The dairy farmers in the chapter called Milk Profit & Quality were allergic to their own milk, but loved it after doing all the correct things and Fonterra gave them a 'Top Milk Quality Certificate' in 2015.

Boron is an important element

It is needed for bone and joint health, and helping the absorption of calcium, magnesium and phosphorus from foods. It also reduces the loss of these important minerals in urine. Boron can increase mental alertness, reduce osteoarthritis, osteoporosis, arthritis, knee clicking from dry joints, and inflammation. The widespread boron deficiency that exists through most of USA, New Zealand and many countries, is a major reason for the extensive suffering that the deficiency causes, as well as knee and hip replacements, however, boron can't repair severely damaged joints.

I Googled for 'Boron prevents arthritis' and it brought up 300,000. They are not all wrong. I googled 'Is arthritis caused by boron deficiency' and five million came up. They can't all be wrong. In one study involving subjects with osteoarthritis, 50% of the patients who received a daily supplement of 6 mg of Boron (two 3 mg tablets) had less pain from movement.

It is difficult to prescribe the exact amount to take, as soils and diets vary so much between regions and countries, and some people weigh 65 kg while in USA where most trials are done, average men weigh 88 kg and women 84.

Boron is in centuries old dried salt lakes, and is mined mainly in California and Turkey with a little in Argentine. Mercury in parts of some of the mines is a problem so can be in most B supplements.

Organic Virgin Coconut oil ex Philippines is Fair Traded and GMO free, and has ample B and Selenium. Organic forms in non-toxic organic vegetables, like Coconut oil, are not likely to cause excess problems. Large amounts of it, have cured many health problems in many people in many countries.

B helps increase low testosterone levels in mature men, and oestrogen levels in menopausal women, who don't need as much as men, so should take only two a day. B also helps make vitamin D active, and increases calcium uptake and absorption into bones and teeth. Also, other beneficial effects have been reported such as reducing heart problems, helping vision, balance, memory and cognition. and reducing psoriasis. Research showed that B helped with the prevention of Alzheimer's.

In South Africa, the Xhosa tribe, in their home mountainous area where their water contains Boron, only 3% have arthritis. After they move to another area, their arthritis rate increases to its 20%. (Journal of Applied Nutrition 46: 81 ~ 85, 1994.)

Most of USA and all New Zealand are very low in Boron while eastern Mediterranean and Philippines have higher levels, and people have less arthritis.

In areas of the world where Boron intake is 1 milligram or less per day, the incidence of arthritis ranges from 20% to 70%, whereas in areas of the world where Boron intakes range from 3 to 10 milligrams per day, the arthritis incidence ranges from 0% to 10% (Environmental Health Perspectives 102: 83-85S, 1994).

Boron reduced Auriel's hip and leg pains and stopped the clicking in my knees that occurred after sitting in a chair or at the desk for an hour or more and then standing up. Stopping clicking from friction reduces the necessity for joint operations, which we have not needed.

Taking Selenium since the 1960s with vitamin A and E have helped, because selenium strengthens the muscles that support joints. In 2011, taking optimum amounts of selenium reduced osteoarthritic pain in Auriel's neck so much that she no longer had to lie down four times a day to ease the pain. Read Selenium in Human Health > Elements where this selenium information comes from.

Bone analysis showed that arthritic joints and adjacent bones had only half the Boron level of healthy joints. Equally, it has been found that the fluid that lubricates joints and provides nutrients to the cartilage is Boron deficient in arthritic joints. Boron supplemented bones are harder and surgeons

found them more difficult to cut through. Bone fractures heal in about half the normal time in both people and animals.

Another cause of leg joint problems is weight on the joints, so larger people have more problems, as do those lifting heavy things, like farmers and timber yard workers, AND those carrying about 10 kg in a paunch. The first person I knew who had to have both knees replaced in 1985 worked in a timber (lumber) yard for decades lifting and moving timber manually.

Where possible, we should use wheels or carry lighter loads. When standing or sitting most of the day the lubricant gets squeezed out and can't get in again until lying down on your side or stretching. See > Human Health > Joints. Read Backs.

It has been found that up to 30% of those with osteoarthritis experienced a Herxheimer reaction, which is a short-term reaction as the body detoxifies itself, leading to headaches, joint and muscle pain, sweating, chills, nausea and other flu-like symptoms.

Sources

We fertilise our 14 vegetables with complete natural deficient minerals, including OrganiBOR, based on their measured levels. After checking all the boron supplements we could find and figures from USA and found mercury in all, we now eat 3 ml of Ceres Philippine coconut oil. More than that caused me to show excess boron and selenium symptoms. Ceres organic virgin cold compressed coconut oil contains 90 ppm of boron and 90 ppm of selenium, without any toxins.

Supermarket vegetables are higher in heavy metals, caused partly by superphosphate which contains and releases them, and its acidity makes those in the soil more available. See Fertilisers. Applying enough LimePlus (agricultural lime, magnesium, boron and measured deficiencies in plant analyses) does the opposite by making heavy metals and aluminium less available.

Arthritis

This is an inflammation of joints, while the term 'rheumatism' includes a variety of symptoms, such as inflammation, pain, tenderness and stiffness of muscles and joints. These conditions are extremely widespread and many people in low boron countries develop some form of arthritis or rheumatism during their lifetime. Boron reduces the bad effects (dry joints) of fluoride in water. See Human Health Elements > Fluoride.

In the 1960's, when he was a soil and plant scientist in Perth, Western Australia, Rex Newnham, Ph.D., D.O., N.D, developed arthritis. Conventional drugs did not help him, so he looked for the cause in the chemistry of plants. He knew that plants in his area were mineral deficient, and knowing that Boron aids calcium metabolism in plants, he decided to try it himself and started taking 30 mg of Boron a day. In three weeks, all pain, swelling and stiffness had disappeared.

Boron also helps other forms of arthritis, such as Rheumatoid Arthritis, Juvenile Arthritis, and Lupus (Systemic Lupus Erythematosus). For instance, Dr Newnham saw a young girl aged 9 months with juvenile arthritis. He was able to cure her in 2 weeks.

He told public health and medical authorities about his discovery, but they were not interested. However, other people with arthritis were delighted as they improved. Others were scared to take something with a poison label on the container and meant to kill cockroaches and ants. Eventually he had tablets made with a safe and effective quantity of borax and within five years and only by word of mouth, he sold 10,000 bottles a month. He could no longer cope and asked a drug company to market it. That was a mistake. They saw that this could replace their more expensive drugs and reduce their profits. They had representatives on government health committees and arranged, in 1981, to institute a regulation in Australia that declared B and its compounds to be poisons - in any concentration. He was fined \$1,000 for selling a poison, and this stopped his arthritis cure from spreading in Australia.

The USA, England, Australia and New Zealand generally have average soil-boron levels that give an estimated intake of 1 to 2 mg of B and have arthritis rates of about 20%. But Carnarvon in Western Australia has high B levels in soil and water, and their arthritis rate is only 1%. It is similar in Ngawha Springs, near Kaikohe, NZ, with very high B levels in the spa water which is a curative for arthritis. Apparently all spas curing arthritis have high B levels.

When Dr Newnham discovered the boron-arthritis cure it was not a big problem for the pharmaceuticals because news travelled slowly and was easily suppressed. This is very different now with Internet communication. Most research funding comes from the pharmaceutical industry, and

nothing has come forward to duplicate Dr Newnham's findings and other positive osteoporosis studies. Instead, funding goes into the development of patentable (and money earning) drugs for limited application, or even to discredit boron. A test-tube experiment found that a relatively low dose of about 4 grams of borax can damage lymphocytes, just like an earlier test-tube study showed that vitamin C supplements are toxic. Most positive borax studies now come from China, Japan and Turkey.

Boron and osteoarthritis

Boron also helps to regulate levels of essential minerals, including calcium, magnesium and phosphorus. These minerals are necessary for bone as well as for dental health. Calcium, B and magnesium need each other (with phosphorus, copper, zinc and small amounts of other elements) to form bone. When all the necessary minerals are available, the body renews bone every 7 to 8 years.

Boron helps make vitamin D more available, which helps to regulate oestrogen levels which increases calcium absorption.

One of the first recognised roles of B in human nutrition was its contribution to promoting and maintaining good bone mineralization. Ensuring healthy bones is fundamental to any anti-ageing program, since weak bones can lead to disabling and even life-threatening bone fractures. In one study of postmenopausal women not on oestrogen therapy, those taking B supplements showed significantly less loss of calcium and magnesium, and higher levels of hormones associated with healthy bone mass. Those who took B supplements and were on a magnesium deficient diet demonstrated less bone and mineral loss than the same individuals not supplementing B.

B deficiency, combined with magnesium deficiency, is especially damaging to the bones and teeth. It can cause greatly increased amounts of calcium and magnesium to be lost with the urine. A B supplement will reduce the daily loss of calcium by nearly 50%. As this calcium comes mainly from reabsorbed bone and teeth, B deficiency may be the most important factor in causing osteoporosis and tooth decay.

It has been estimated that 55% of Americans over 50 have osteoporosis and of these about 80% are women. Worldwide one in three women and one in 12 men over the age of 50 may have osteoporosis, and this is responsible for millions of fractures each year.

Osteoporosis and sex hormones

A 2006 study conducted by the US Department of Agriculture showed that within eight days of supplementing with 3 milligrams of B a day, a test group of post menopausal women lost 40 percent less calcium, 33% less magnesium, and slightly less phosphorus through their urine. The form for humans is Calciumborogluconate, which has been used for decades by farmers to cure milk fever in cows. Milk fever is a deficiency of calcium, magnesium and B. Calciumborogluconate (boro is B) is injected into cows suffering milk fever, after which most stand up within minutes. In severe cases in high rainfall leaching soils low in boron like the the New Zealand South Island west coast, a second injection may be necessary. Fertilising with boron helps.

Human health impacts

Boron helps blood brain health, helps remove toxins from the brain, and enhances memory.

It Elevates testosterone and assists in the production of natural steroid compounds.

Boron relaxes the arteries and increases electroconductivity of the heart.

It activates vitamin D.

Protects from oxidation and free radical damage.

Required in trace amounts for healthy bones and muscle growth.

Boron plays a part in the body's sugar metabolism.

Boron is needed for the metabolism of calcium, phosphorus and magnesium.

Read Human Health Elements > Boron for more detailed information regarding the importance of boron controlling arthritis and health.

Vitamin D

Boron can protect against bone loss even when vitamin D is low. It is essential for the utilisation of vitamin D, which enhances the absorption of calcium.

It has been demonstrated that the combination of B, vitamin D, calcium and magnesium in

adequate amounts act synergistically to maintain good bone mineralization. It has been observed that dietary B has a similar effect as supplementation with oestrogen in humans.

The reason for this is that B is necessary for the formation of specific steroid hormones. A clinical trial has demonstrated that both 17-beta-estradiol and testosterone levels significantly increase in postmenopausal women consuming 3 mg/day of B for seven weeks. In this study, B supplementation caused a twofold increase in testosterone concentrations and a significant increase in calcium retention. In another study, men given 10 mg of B a day for four weeks experienced a significant increase in 17-beta-estradiol levels and an increase in plasma testosterone.

Oestrogen levels drop after menopause causing osteoclasts to break down bone. Studies have shown that B provides protection against osteoporosis and reproduces many of the positive effects of oestrogen therapy in postmenopausal women.

Boron and prostate cancer

Boron apparently helps in the metabolism of hormones, in particular increasing testosterone levels, which are important for men. Al Sears, MD, claims B to be the second-most needed nutrient for a healthy prostate - a must-have mineral to help keep your prostate in its natural, walnut-sized shape, and to help the prostate empty the bladder faster and more completely.

Contrary to the medical preference of chemically castrating men who have prostate cancer, research with B has shown that the elevated testosterone levels are beneficial by shrinking prostate tumours and PSA levels (PSA being a marker for tumours and inflammation in the prostate). Also, significantly improved memory and cognition in elderly individuals may be partly due to increased levels of sex hormones and partly to improved membrane functions of brain cells.

In one study, men who ingested the greatest amount of B were 64% less likely to develop prostate cancer than men who consumed the least B. Boron compounds inhibit the activity of many serine protease enzymes, including prostate-specific antigen (PSA). Recent studies indicate that elevated PSA may promote prostate cancer. By breaking down cellular barriers, PSA may enable prostate cancer cells to more readily invade healthy tissue. In animal studies, researchers found that oral administration of a B supplement led to substantial decreases in tumour size, ranging from 25% to 38%. In addition, PSA levels dropped by 86-89%.

Brain-boosting actions

One of the most interesting aspects of B's range of nutritional benefits is its positive effect on the brain and central nervous system. Inadequate B intake can contribute to a lack of energy, ability to stay focused on tasks and mental alertness.

A study of participants on a low B diet performed poorly in tests of manual dexterity, hand-to-eye coordination, attention, perception, and short- and long-term memory when compared to those on a high B diet. Inadequate B intake can contribute to a lack of energy, ability to stay focused on tasks and mental alertness. In another experiment a group of medical students was given either a placebo or 3 mg. of B daily or three months. 92 percent of those taking B demonstrated noticeably greater mental alertness and higher participation in class discussions. Electroencephalogram (EEG) tests have demonstrated that subjects taking B supplements show increased activity in the areas of the brain associated with alertness when compared to subjects with inadequate B intake.

The explanation for these results was that inadequate B intake lowered the activity in brain regions associated with alertness. This has been shown experimentally in humans, who were carefully monitored for changes using an electroencephalogram (EEG) following B supplementation.

Supplements

In New Zealand the soil levels of B and calcium (synergistic) are so low that there is not enough in New Zealand grown food, so supplementing with B is advisable. However, there is enough calcium in our dairy, meat and some vegetables where farmers have applied lime. Don't take any calcium supplements, unless prescribed by a specialist, because it lowers the uptake of magnesium, which is much more important. Read 'Magnesium' in Human Health Elements, and both 'Calcium' and 'Magnesium' in Minerals in Soils, Fertilisers, Pastures & Animals.

When taking B as a supplement, also eat calcium laden foods like dairy products and greens taken at the same time because they are synergistic. People allergic to milk are sometimes not allergic to

cheeses and yogurt. Also take magnesium to release the calcium.

Boron from food

The World Health Organisation has banned B in the form of boric acid, as a food additive and a preservative. Toxic effects include a red rash with weeping skin, vomiting, diarrhoea characterised by a blue green colour, depressed blood circulation, coma and convulsions. A fatal dose in adults is thought to be 15 to 20 grams and in children 3 to 6 grams. Repeated intakes of small amounts can cause accumulative toxicity.

Since 1923 B has been recognised as an essential nutrient for plants, but is still a common deficiency in plants. Boron is found in significant amounts in fruits, nuts and vegetables. Some good sources include apples (42.5 micrograms/gram of dry weight), grapes, tomatoes, celery, almonds, broccoli, bananas, wines and honey.

Sources of B are water (which varies considerably between geographical locations), dairy products and juices. On a wet weight basis, fruits, vegetables, legumes and nuts (dicotyledonous plants) contain much more B than grains, breads, and cereals (monocotyledonous plants). Fruits that are good sources of B include pears, prunes, apples, raisins, and tomatoes, but if soils levels are low, food levels will be low. Be aware that B soil levels are higher in arid climates. Animal products (meats, poultry, fish, etc.) contain very little B.

Chemical fertilisers, like superphosphate, inhibit the uptake of boron from the soil: an organic apple grown in good soil may have 20 mg boron, but if grown with superphosphate it may have only 1 mg of boron. Fertilisers combined with poor food choices have greatly reduced our boron intake compared to 50 or 100 years ago.

Further, unhealthy cooking methods greatly reduce the availability of boron from food. The cooking water of vegetables containing most of the minerals may be discarded during home cooking or commercial processing; the phytic acid in baked goods, cereals and cooked legumes may greatly reduce availability, while gluten sensitivity and Candida overgrowth inhibit the absorption of minerals. All this makes health problems due to boron deficiency now very common.

Raisins are one of the richest sources of B. Sprinkle a handful into calcium-rich yoghurt for optimum bone-benefits and add pecans, another food rich in B.

Fertilising boron at home

New Zealand and USA are both very low in B, so the health organisations should promote the application of B with fertilisers on vegetables, pastures and forage crops, and then promote the benefits of B which would then be in our meat and dairy products for humans.

Fertiliser slow release B should be available in most areas, either in a fertiliser mix or as an individual element, but before applying it to your vegetable garden test it on your lawn. Pasture B optimums are known in grasses (see the spreadsheet Pasture Mineral Analysis, Row A 28 to X 28). Send some of your lawn grass to a laboratory just for B or take advantage of getting all 17 elements analysed. See Pastures > Sampling & Reading.

If deficient, a B fertiliser product such as OrganiBor (the best value slow release which doesn't leach and pollute like some do), can be applied to vegetable gardens annually at between 10 and 20 kg/ha (10,000 square metres) or 0.002 kg per square metre (18 lb/a or 0.002 lb/sq yard). Too much will burn the edges of leaves just like a deficiency does.

See GrazingInfo > Minerals in Soils, Fertilisers, Pastures & Animals > Boron, for more on it.

Some citrus can be sour when B is deficient. Applying a B product at up to 20 kg per ha (18 lb per a) or 0.01 kg per 5 m² (2.2 m by 2.2 m) under the tree can, after several months, make the fruit taste sweeter. Try yours, and you'll see why animals prefer pastures with optimum B levels.

If B is low in your garden, apply OrganiBOR at a maximum of 20 kg per hectare which in gardens is 0.02 kg per 10 m², but NOT if B has already been applied in your fertiliser.

Fertiliser Boron should not be consumed, nor should oxides or fertilisers. They are quite different.

Boron deficiencies

New Zealanders have one of the highest incidences of arthritis deficiency. The country with the highest arthritis incidence in the world, Jamaica, also has the lowest concentration of B in their soils.

Symptoms of B deficiency include -

- inability to stay focused on tasks and mental alertness.
- attention deficit hyperactivity disorder (ADHD) allergies, autism, cystic fibrosis, dyslexia, liver and oesophageal cancer.
- arthritis and painful distorted joints.
- bone loss in post-menopausal women.
- breathing problems, asthma, tightness in throat or chest, chest pains.
- carpal tunnel syndrome.
- clicking knees or joints - elbow joints don't click as they are not subject to weight or pressure.
- decreased ability to handle stress.
- depression.
- dermatitis, skin hives, rash or itchy swollen skin.
- diarrhoea.
- hormonal imbalance.
- lack of energy or muscle pain or weakness.
- lethargy.
- memory problems.
- nails can change from strong pink to having wide, light brown stripes.
- nausea and vomiting.
- osteoporosis.
- tooth decay and receding gums.
- weak bones and teeth, combined with magnesium deficiency.

Symptoms of excess boron

Because B is easily absorbed and the surplus excreted in urine, its potential for toxicity in humans is low. However, in individuals with kidney problems, B intake, like any intake of an excess, particularly potassium, should be prevented as impaired kidney function could reduce excretion resulting in B accumulation. These tips of fingers turning up was from taking excess



boron of 20 mg of B a day. Boron's antidote is vitamin B2. The 20 mg is not a definite figure, because it depends on the person's weight, and the level in their foods, plus their kidney health.

The dirty white on the thumb was from excess B caused by 9 mg a day supplemented, plus consuming home grown vegetables fertilised with slow release OrganiBOR, plus the recommended level tablespoon of organic coconut oil a day, and a little olive oil, both from adequate B soils in the Philippines.

Boron tends to increase the levels of calcium and oestrogen, and lowers blood glucose, and vitamin B6 and zinc.



Health effects of Boron

Due to their content of boron, borax and boric acid have basically the same health effects, with good antiseptic, anti-fungal, and antiviral properties but only mild antibacterial action. In plants as well as animals, boron is essential for the integrity and function of cell walls, and the way signals are transmitted across membranes.

Boron deficiency combined with magnesium deficiency is especially damaging to the bones and teeth. It also has a role in converting vitamin D to its active form, thus increasing calcium uptake and deposition into bone and teeth rather than causing soft tissue to calcify.