



HEALTHY BONE FACTORS™

Supports bone mineral density and helps prevent osteoporosis

BONE: LIVING TISSUE

Bones are not inert structures, like the beams of your house. They are dynamic living tissue that constantly regenerates. Thus it is possible for people with osteoporosis to increase their bone mineral density and strengthen their bones, and for people at risk for osteoporosis to mitigate their risk.

Throughout life, your bones constantly remove old, weakened material and add new material in a dynamic process called remodelling. Each week you recycle up to 7% of your bone mass. This natural rejuvenation process requires not just calcium, but a wide range of nutrients. Healthy Bone Factors from Natural Factors provides a balanced spectrum of the key nutrients essential for supporting the remodelling process. Along with optimal nutrition and exercise, Healthy Bone Factors can fortify bones for a lifetime and help prevent osteoporosis.

WHAT IS OSTEOPOROSIS?

Osteoporosis is a condition in which tiny holes develop inside the bones, leaving them weak, brittle and prone to fractures. The term comes from Latin, meaning “porous bones.” Bones become porous when the remodelling process removes old bone tissue faster than it can build up new bone. Normally, the rates of breakdown and build-up are the same, but if the amount of new bone being built does not keep pace with the amount being broken down, osteoporosis can occur.

Osteoporosis is most common in postmenopausal Asian and Caucasian women. Men are diagnosed with the disease less often, although their rates are growing. Other risk factors include: family history of osteoporosis; physical inactivity; short stature; low body mass and/or small bones; never having been pregnant; and inadequate nutrition and exercise. According to the Osteoporosis Society of Canada, one in four women over 50 has osteoporosis and one in eight men over 50.

BONE-BUILDING DIET AND EXERCISE

The regeneration of healthy bone can be supported by adequate intake of key nutrients in combination with healthy lifestyle choices. A diet that is too high in protein, salt, refined sugar or acid-forming foods, causes calcium removal from bones and increases calcium loss in the urine. Bone health is supported by avoiding excess protein and salt, and eating an alkaline-based diet that focuses on vegetables, fruit, nuts, and legumes while avoiding over-consumption of meat and dairy.

Soft drinks containing phosphates are linked to osteoporosis because they lead to lower calcium levels and higher phosphate levels in the blood. When phosphate levels are high and calcium levels low, calcium is pulled out of the bones.

Many plant foods are a rich source of vitamins and minerals that are important for healthy bones and offer significant protection against osteoporosis. They include calcium, vitamin K, and boron. These nutrients are found in green tea and green leafy vegetables from the cabbage family, including broccoli, Brussel sprouts, kale, collards, and mustard greens. However, few people consume enough of these foods. Research shows that supplementation is an effective way to ensure an adequate supply of the nutrients that contribute to bone health.

Exercise is essential for bone health. Just as muscles are built up by exercise, so are bones too. Load-bearing exercise stimulates an increase in bone diameter in people of all ages. One of the most important things a person can do to strengthen their bones is physical activity. Exercise, consisting of one hour of moderate activity three times a week, has been shown to prevent bone loss and increase bone mass in postmenopausal women, whereas lack of physical activity doubles the rate of calcium loss. Research shows that to be effective, exercise must be supported by adequate intake of calcium and other nutrients that support bone health (Borer).

HOW DOES HEALTHY BONE FACTORS WORK?

Our bodies have a natural bone-repair system that operates at all stages of life. Bone remodelling is a two-part process. Cells called osteoclasts break down old, weakened bone in a process called resorption. Then cells called osteoblasts rebuild fresh, healthy bone mass. The hard structure of bone is composed primarily of inorganic minerals like calcium, magnesium, and phosphorus. The osteoblasts create this structure around a matrix of organic proteins. These proteins are synthesized by enzymes that require adequate supplies of key vitamins and trace minerals. Healthy Bone Factors provides the nutrients required for protein synthesis, as well as the minerals required for the hard structure. This synergy of nutrients ensures your body has all the components needed to generate healthy bone.

THE MANY BENEFITS OF HEALTHY BONE FACTORS

The key nutrients in Healthy Bone Factors have been shown to:

- Prevent osteoporosis
- Increase bone mineral density
- Slow the rate of bone loss
- Stimulate good bone cell structure
- Enhance calcium utilization and retention

PREVENTING OSTEOPOROSIS

Calcium is required for growing bodies. By age 20 in men and age 16 in women, bones typically stop growing in length but continue to add mass until around age 30, when peak bone

mass is reached. The greater this peak bone mass, the less likely our bones are to become porous and fragile later in life. Consequently, good calcium nutrition is critical so that our bodies do not have to dip into our only calcium reservoir – our bones. Although calcium is by far the most abundant and important mineral for healthy bones, there are many other critical bone-building nutrients that enhance calcium utilization and retention and help prevent osteoporosis. Studies have found that magnesium deficiency leads to bone loss and is associated with osteoporosis. Women with osteoporosis have lower bone magnesium content and other indicators of magnesium deficiency than people without osteoporosis. Research conducted by the US Department of Agriculture showed that a substantial number of males and females have inadequate magnesium intake. Magnesium supplementation is thought by some experts to be as important as calcium supplementation in the prevention and treatment of osteoporosis (Rude, *et al.*).

The role of vitamin D in bone health has been widely studied and it is now commonly used in the prevention and treatment of osteoporosis. When calcium is combined with vitamin D better results are achieved than for either nutrient alone. It is especially helpful for people with osteoporosis or who are at high risk for vitamin D deficiency, particularly older women and men who do not get sufficient exposure to sunlight (which stimulates the manufacture of vitamin D), and people who live far from the equator in places such as Canada (Boonen, *et al.*).

Recent clinical trials and epidemiological studies have shown that a wide range of nutrients are essential to bone health and inadequate intake leads to osteoporosis. Calcium, magnesium, phosphorus, potassium, manganese, copper, boron, iron, zinc, vitamins D, A, K, and C, and the B vitamins all play a role in preventing osteoporosis (Palacios).

INCREASING BONE DENSITY

Studies show soy isoflavones are effective in reducing bone loss and increasing mineral bone density, with a resulting decrease in fracture rates for women with osteoporosis (Krinsky, *et al.*). They slow bone resorption allowing the osteoblasts to build up bone mass (Uesugi, *et al.*). Current research indicates that many

nutrients, including vitamin B12, vitamin K and silicon, play an essential role in bone health, reducing the risk of fractures by increasing bone density and improving bone microarchitecture. Healthy bone is composed of tiny arch-like structures that provide strength in the same way that the arch contributes strength in a building. In osteoporotic bone, these structures lose their arch shape as bone mass is lost and not replaced (Kitchin, *et al.*). Vitamin K helps rebuild bone structure by converting inactive osteocalcin to its active form, which then anchors calcium molecules and holds them in place within the bone. A lack of vitamin K in the diet is a major risk factor for osteoporosis even if calcium intake is high.

Population-based studies have found that bone health is promoted by vitamin K2. This vitamin plays an important role in synthesizing the proteins involved in bone metabolism. A clinical study of 325 post-menopausal women found that those receiving supplementation with vitamin K2 experienced no loss of hip bone strength or bone mineral content during the three-year trial, while those in the placebo group experienced significant loss of bone strength (Knapen, *et al.*).

Epidemiological studies suggest that inadequate levels of vitamins B6, B12, and folate are associated with poor bone quality and fractures due to osteoporosis. If a person is deficient in these vitamins, there will be an increase in homocysteine, which has been implicated in a variety of conditions including atherosclerosis and osteoporosis. These B vitamins also produce better results when taken together than individually (McLean, *et al.*).

Proper calcium utilization requires adequate phosphorus since bone mineral is composed of calcium phosphate. Research indicates that calcium supplements can actually increase the risk of osteoporosis if they are formulated without phosphorus. Clinical trials involving 636 inpatients showed that an increase in calcium without a corresponding increase in phosphorus resulted in a decrease in total phosphorus absorption. This can cause a deficiency of phosphorus and contribute to osteoporosis. The researchers concluded that people with osteoporosis should be given supplemental calcium in the form of calcium phosphate. This form has

been shown to improve calcium utilization and build stronger bones than calcium alone (Heaney, *et al.*).

DOSAGE

Recommended adult dose: 2 tablets, 2 times daily with meals, a few hours before or after taking other medications, or as directed by a health care practitioner. For adult use only.

SAFETY

Pregnancy and lactation: Suitable for pregnant and lactating women

Children: Not recommended for children unless recommended by a health care practitioner

Drug interactions: Consult a health care practitioner if you are taking blood thinners

Contraindications: Not recommended for anyone hypersensitive to soy isoflavones

Healthy Bone Factors contains natural, scientifically-proven ingredients for strong healthy bones. Along with a healthy diet and exercise, Healthy Bone Factors can fortify bones from youth to old age and help reduce the risk of developing osteoporosis.

KEY REFERENCES:

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