

BONES ARE CONSTANTLY BEING REBORN







FOR HEALTHY BONES AT ANY AGE

What is MBP[®]?

MBP[®] is a natural protein that is contained in trace amounts in bovine milk and human milk.

Although milk contains protein in abundance, MBP[®] accounts for only a small portion of milk's overall protein content. A breakdown of bovine milk's composition is depicted to the right. MBP and its effects on bone and joint health was discovered by Snow Brand Milk Products Co., Ltd.



A multi-functional protein that works directly and/or indirectly on bone cells to form healthy bones.

MBP®'s most important characteristics are that it increases the number of bone-forming osteoblasts (cells) and regulates the activity of bone-destroying osteoclasts (cells). However careful one is to ingest enough calcium, if the body's ability to form bone is impaired, the calcium does not adhere to the bone effectively. MBP® is a multi-functional protein: by acting directly and or indirectly on the bone cells, it vitalizes the bone itself and promotes the formation, while at the same time inhibiting excess bone destruction (bone resorption).



Helps calcium to adhere to bonesPreventS calcium from dissolving bones

Differences in function between MBP[®] and other substances

In recent years the Vitamin K in natto (fermented soybean) and Isoflavone in soybeans have become widely known as substances that contribute to the health of bones. Vitamin K acts mainly to promote bone calcification and reduced the number of osteoclasts, and Isoflavone operates mainly to inhibit osteoclastic bone resorption. By comparison, a key characteristic of MBP® is that it functions on both osteblastic bone formation and osteoclastic bone resorption.

			PROMOTION OF BONE FORMATION			INHIBITION OF BONE RESORPTION	
	Supplements Calcium	Accelerates Calcium Absorption	Increases the number of bone- forming osteoblasts	Osteoblastic promotion of collagen formation	Promotes bone calcification	Reduces the number of bone- destroying osteoclasts	Inhibits resorption by osteoclasts
MBP [®]							
Isoflavone							
Vitamin K						•	
Calcium							
Magnesium			•				
Vitamin D							
CPP (Casein Phopho Peptide)		•					



The Basics of Bone Structure

Why do broken bones mend and return to their normal condition? The reason is that they are live tissues.

Looking at the bones of dinosaurs on display in museums or the mock-up skeletons in science rooms, it may be difficult to comprehend that bones are live tissues. However, the fact is that narrow blood vessels run lengthwise and crosswise inside the bone, and bone cells are vigorously active. The reason broken bones are mended and restored to their normal condition is that these bone cells create new bone.

Bones are not made only of inorganic calcium.

Bones are not made only of calcium. Simply put, they are made of calcium and collagen, a type of protein. The structure of bones can be likened to that of reinforced concrete, with calcium corresponding to the cement and collagen to the reinforcing rods.



Jack Weston

Bones are reborn through a process called remodeling.

Because bones are living organisms, metabolism continually takes place and old bone is replaced by new bone. In other words, bones are reborn little by little each day through a process referred to as remodeling. In adults, this cycle of remodeling is said to occur over a period of three years. Of course, from the time we are born, this metabolism of bones is repeated over and over, regardless of our current age.



Bones fill two major roles.

The bones of all land animals-including human beings-fill two major roles. The first role is to support the body: our strong skeletons allow us to live on land without collapsing under our own weight. The second role is to act as a calcium storehouse. As a substance essential to the functioning of every type of human body cell and nerve transmission, calcium is stored in bones. Calcium is dissolved out of our bones and carried to the various body tissues as necessary.





The Remodeling Process in Bones: Osteoblastic Bone Formation & Osteoclastic Bone Resorption

Two types of body cells are primarily involved in the remodeling of bones: osteoblasts and osteoclasts. Osteoblasts are cells that create bone. Osteoclasts are cells that destroy bone. These cells are constantly at work in the remodeling process of bones.

Why are bones reborn?

There is a reason our bones are reborn not only during the growth stage when bones grow rapidly, but also after we reach adulthood. The reason is to rejuvenate aged bones. Even healthy bones lose their resilience when they grow old. As our bones are reborn their supple strength is sustained.

The function of osteoclasts

Osteoblasts are bone-forming cells. Osteoblasts create the collagen, the "reinforcing rods" of bones, and coat it with protein that acts as a "paste" to have calcium adhere to the collagen. The calcium carried by the blood naturally adheres to the area covered with "paste" and new bone is created.

The process of bone rebirth

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The function of osteoclasts

Osteoclasts are bone-destroying cells. Originating as a type of blood cell, these cells are stimulated by hormones and become differentiated into osteoclasts inside bone. These osteoclasts dissolve the calcium and collagen of aged bones with acid and enzyme. The dissolved calcium is again carried throughout the body through the blood vessels.



The problem with osteoclasts is their excess activity.

Osteoclasts are intrinsically important body cells that destroy bone to promote the rebirth of bone and dissolve the necessary amount of calcium required by the body. However, when the body's hormonal and other balances are disrupted, osteoclasts at times dissolve more calcium than necessary. This situation is particularly conspicuous among post-menopausal women. In other words, the cause of osteoporosis is said to be calcium deficiency and "runaway" osteoclasts. Suppressing this excess activity of osteoclasts is important.



MBP[®] Activates Ostseoblastic Bone Formation and Regulates Osteoclastic Bone Resorption

MBP supports the healthy formation of bones by working both directly and indirectly on osteoblasts and osteoclasts. By activating osteoblastic formation, MBP suppresses osteoclastic bone resorption making bones more receptive to calcium.

The key characteristic of MBP[®] is that it works directly and indirectly on bone cells.

MBP®'s most important characteristic is that it works directly and indirectly on both osteoblasts and osteoclasts. It makes bones receptive to calcium while at the same time deterring excessive dissolving of calcium and collagen of the bones. As a result, MBP® supports healthy bones.



The calcium you ingest is wasted if it's not incorporated into your bones.

Because calcium cannot be synthesized within the body, it can only be obtained through meals or otherwise ingested. The calcium is absorbed from the intestine into the body and carried to the bones by the blood stream. However, even though calcium is ingested, if it does not adhere to and is not incorporated into the bones, it is expelled from the body in the urine or feces.

The key to building healthier bones.

Needless to say, ingesting an adequate supply calcium and appropriate exercise are important in strengthening the bones. However, that alone is not enough. The body must be able to utilize the calcium ingested and store it properly in order to revitalize the bones. MBP's unique mechanism of action addresses bone health at a cellular level. The future of healthy bones is MBP.

The Functions of MBP

- MBP increases the number of boneforming osteoblasts.
- MBP[®] promotes collagen formation by osteoblasts.
- MBP[®] inhibits excessive bone destruction by osteoclasts.
- MBP[®] maintains normal bone metabolism, tissue, and structure.



MBP[®] Improves Bone Metabolism for People in Each Age Group

The following is an explanation of the functional relationship between bone-forming osteoblasts and bonedestroying osteoclasts for various age groups.

Growth Stage

Activate your bone development



The growth period is a time when the metabolism is active and bones are vigorously formed, while at the same time destroyed. However, because the boneforming function is more powerful than the bonedestroying function, the body grows larger. Diet and exercise are very important

in promoting this growth function during this period. It is said that bone mass increases until about the age of twenty for the backbone and until about the age of thirty for the bones in the limbs.



Maturity Period

Take care to keep strong bones for the future



From the thirties onward, our bodies are fully grown and have reached peak bone mass. This is also a period when the bone remodeling and resorption functions are in balance. At this time, a balanced diet can be critical in delaying future bone mass decrease.



Old Age

Protect yourself from osteoporosis



From the forties onward, bone mass slowly decreases. This is a period when, bone remodeling and resorption weaken, but the bone-destroying function is stronger. Osteoporosis can set in if this situation is allowed to progress. Consequently, it is extremely important to delay, as much as possible, the onset of bone mass reduction





Why is osteoporosis prevalent among women?

Osteoporosis is prevalent among women for two primary reasons. The first is that women's skeletons are typically smaller than those of males so they have lower bone mass. The second is that the female hormone estrogen exerts a major influence on bone health. One of estrogen's functions is to inhibit bone-destroying osteoclasts. At the onset of menopause, the exertion of estrogen nearly ceases. This causes an excess of osteoclast activity in which bone is increasingly destroyed which can lead to osteoporosis. MBP supports a balance in osteoblast and osteoclast activity.



MBP[®] Frequently Asked Questions

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MBP[®] isn't necessary if I get lots of calcium, is it?

If your bone cells don't function properly, ingested calcium cannot be incorporated into your bones.

Calcium is merely the material used to form bones. It is osteoblasts that actually perform the task of forming your bones. Balance between osteoblasts and osteoclasts is important for the healthy rebirth of bones. No matter how much calcium you ingest, if your bones are not receptive to the calcium, it isn't fully incorporated into the bones. Because MBP activates the function of osteoblasts and suppresses excessive osteoclastic activity, it supports the foundation upon which bones are built. MBP promotes healthy bone formation by supporting the effective utilization of calcium obtained through milk or other sources.

How long should I take MBP in order to experience improvement?

A study has shown that MBP can enhance bone density within a six month period.

One study demonstrated that daily

supplementation with MBP resulted in improved bone metabolism after three months and enhanced bone density after six months. Because bone metabolism proceeds at an extremely gradual pace and bones are "reborn" each day, MBP is best used as a long-term daily supplement that can support bone health throughout life..

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Isn't MBP[®] digested in the stomach?

MBP[®] is resistant to digestion.

In experiments in which we artificially created MBP in digested form, the digested MBP[®] worked in osteoblasts and osteoclasts in the same way as undigested MBPI These finding suggest that even if MBP[®] is digested, thecrucial components that work on the bobes are delivered to the bones unchanged in nature. What's more, we found the componenents of MBP[®] work on bone cells are absorbed through the small instestine.





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