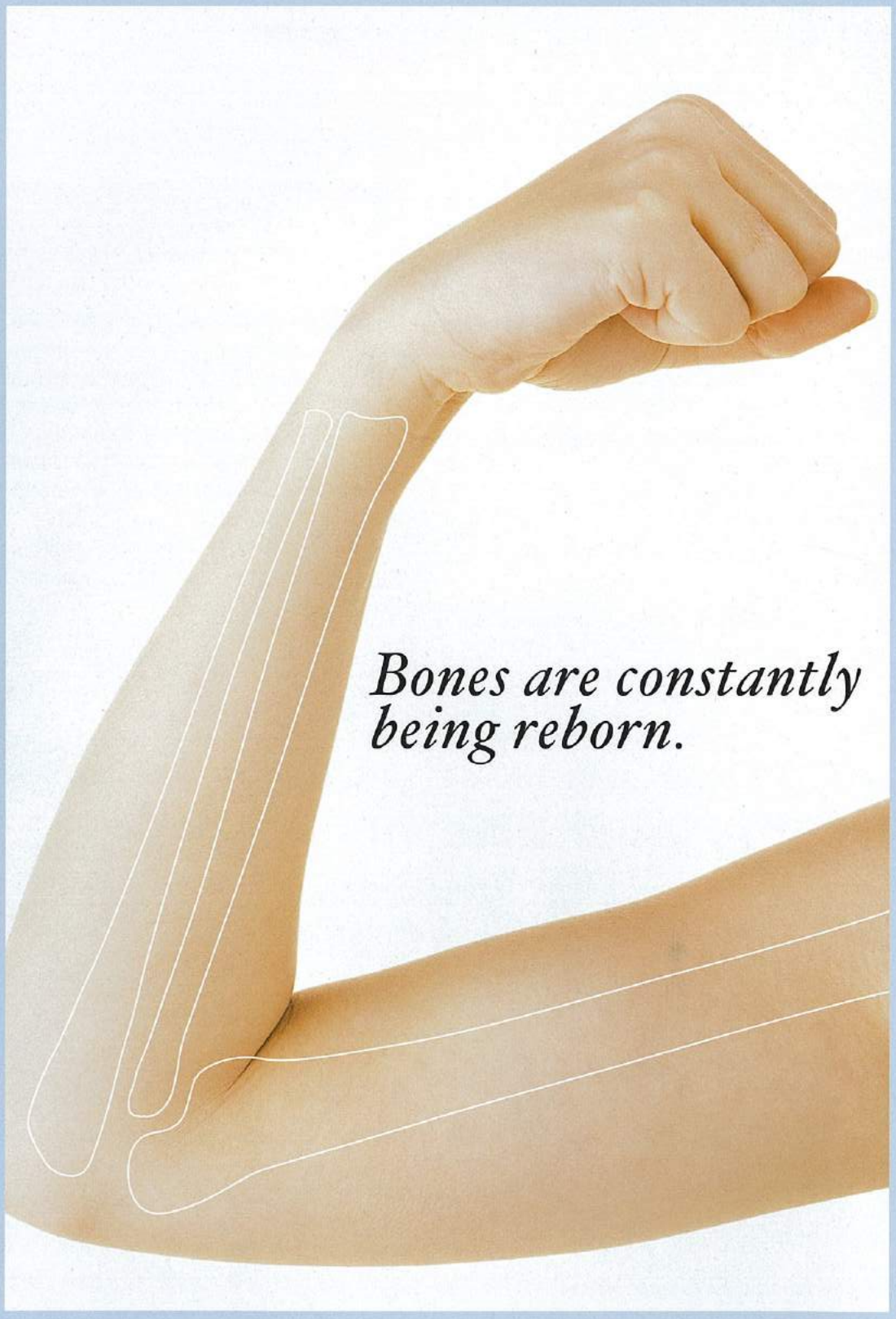


A trace element in bovine milk and human milk

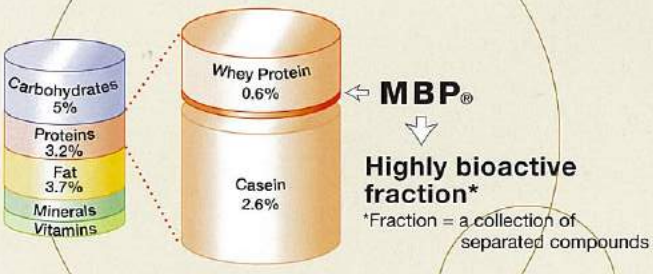
MBP®

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 the composition of bovine milk is depicted below. The effect of this protein on bone was discovered and was named MBP® by MEGMILK SNOW BRAND Co., Ltd.

The composition of bovine milk



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 bone cells, it vitalizes the bone itself and promotes the bone formation, while at the same time inhibiting excess bone destruction (bone resorption).

MBP®

Differences in function between MBP® and other substances

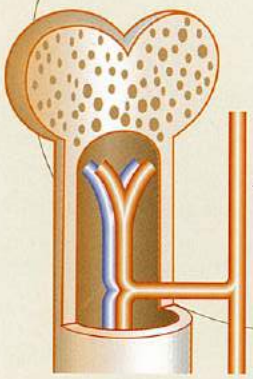
In recent years the Vitamin K in natto (fermented soybeans) and Isoflavone in soybeans have become widely known as substances that contribute to the health of bones. Vitamin K acts mainly to promote bone calcification and reduce the number of osteoclasts, and Isoflavone operates mainly to inhibit osteoclastic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

	Calcium nutrition		Promotion of bone formation			Inhibition of bone resorption	
	Supplements calcium	Accelerates calcium absorption	Increases the number of bone-forming osteoblasts	Promotes collagen formation by osteoblasts	Promotes bone calcification	Reduces the number of bone-destroying osteoclasts	Inhibits bone resorption by osteoclasts
MBP®	–	–	◎	◎	–	◎	◎
Isoflavone	–	–	–	–	–	–	◎
Vitamin K	–	–	–	–	◎	◎	–
Calcium	◎	–	–	–	–	–	–
Magnesium	–	–	–	◎	–	–	–
Vitamin D	–	◎	–	–	–	–	–
CCP (Casein calcium 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.

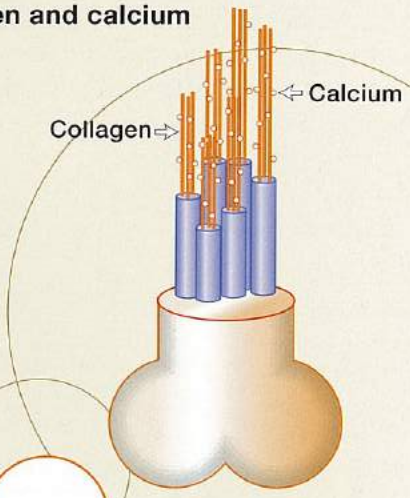
Looking at the bones of dinosaurs on display in museums or the mock-up skeletons in science rooms, it may be difficult to comprehend that bones are live tissues. However, the fact is that narrow blood vessels run lengthwise and crosswise inside the bone, and bone cells are vigorously active. The reason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

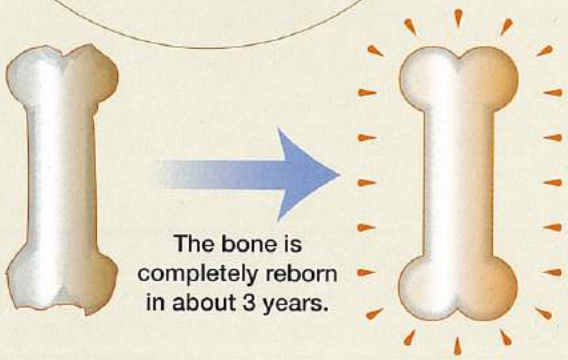
Bones are not made only of calcium. Simply put, they are made of calcium and collagen, a type of protein. The structure of bones can be likened to that of reinforced concrete, with calcium corresponding to the cement and collagen to the reinforcing rods.

Collagen and calcium



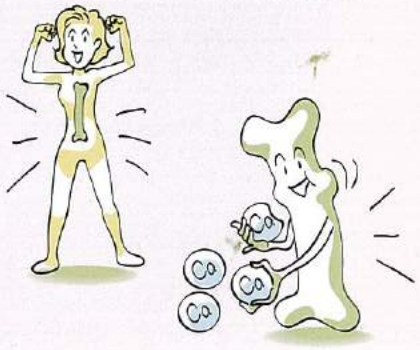
Bones are reborn little by little each day (remodeling).

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 (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.

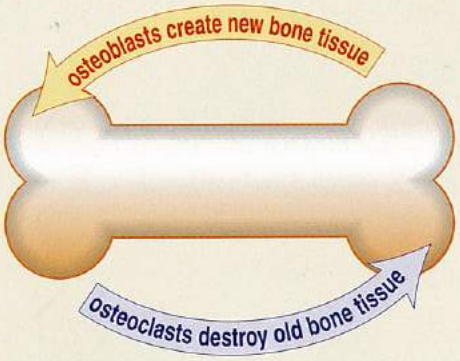


Osteoblastic Bone Formation and Osteoclastic Bone Resorption Are the Remodeling Process in Bones.

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.



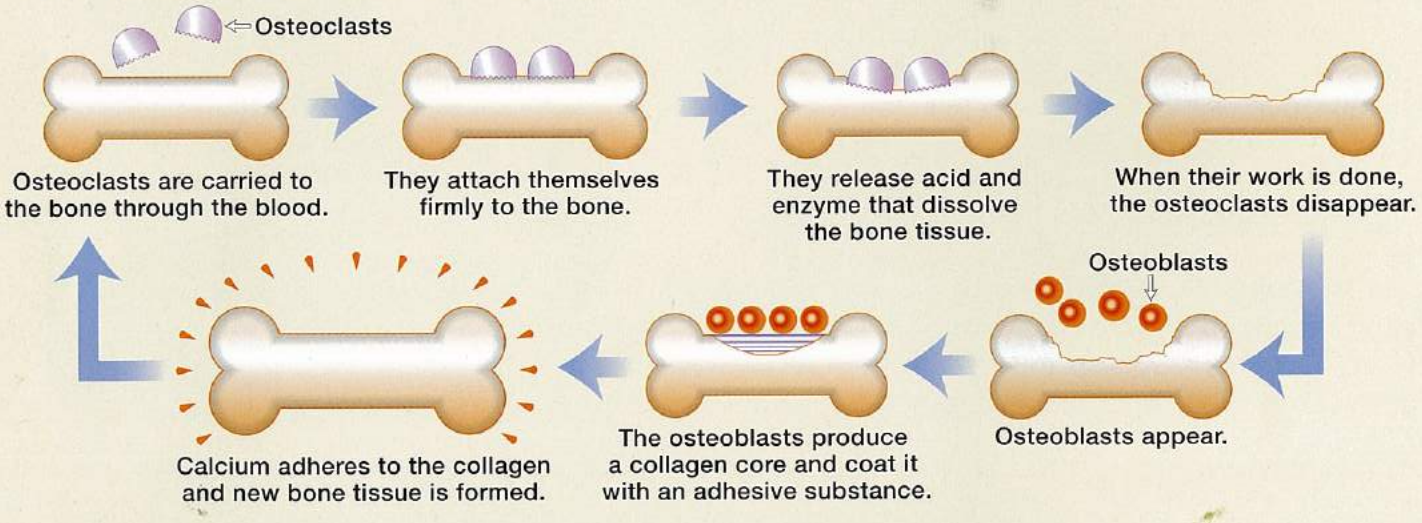
The function of osteoblasts

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 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 process of bone rebirth



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.