AOR CODE: AOR04111

Premium

Advanced Bone Protection

Increases Bone Growth and Reduces Bone Loss

- Scientifically proven to improve bone density
- Boosts collagen production and calcium usage
- A protein complex derived from milk

Gluten Free  Non-GMO  Vegetarian  Bone Health

AOR Code  Variant
AOR04111  30 VEGI-CAPS

Details
Advanced Bone Protection contains MBP™ (Milk Basic Protein), a specific whey protein fraction found in trace amounts in bovine milk. MBP is considered to be so safe and vital that some food items are fortified with MBP in Japan, where it was discovered. Advanced Bone Protection is not a source of calcium, but rather a beneficial adjunct to any calcium-based bone health regimen for those who are at risk of developing, or already suffering from, osteoporosis. It can also be used to support bone healing after sustaining a fracture. One of the best things about Advanced Bone Protection is that the therapeutic daily dose fits into just one small capsule, which can be taken at any time of day, with or without food or other supplements.

Label Info

Discussion
Advanced Bone Protection contains MBP™ (Milk Basic Protein), an active protein complex from the whey fraction of milk. Research demonstrates that MBP can positively impact bone health by reducing bone loss (resorption) and increasing bone mineral density.

Product Variation

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<tr>
<th>Product Code</th>
<th>Size</th>
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<tbody>
<tr>
<td>AOR04111</td>
<td>30 VEGI-CAPS</td>
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### Supplements Facts

<table>
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<th>Serving Size: 1 Capsule</th>
<th>Amount</th>
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<tr>
<td>MBP™* (a specific basic protein fraction derived from milk)†</td>
<td>40 mg</td>
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*MBP™ is owned by Snow Brand Milk Products Co., Ltd. in Canada.

Non-medical ingredients:
- microcrystalline cellulose, sodium stearyl fumarate. Capsule: hypromellose.

### Guarantees

AOR™ guarantees that all ingredients have been declared on the label. Contains no wheat, gluten, corn, nuts, peanuts, sesame seeds, sulphites, mustard, soy, eggs, fish or shellfish.

### Adult Dosage

Take 1 capsule daily with/without food or as directed by a qualified health care practitioner.

### Cautions

Not recommended for people with milk allergies.

### Source

Bovine milk

### Main Application

Bone health

Women's health

### Disclaimer

The information and product descriptions appearing on this website are for information purposes only, and are not intended to provide or replace medical advice to individuals from a qualified health care professional. Consult with your physician if you have any health concerns, and before initiating any new diet, exercise, supplement, or other lifestyle changes.

### Research

#### Background

**What Is Advanced Bone Protection™?**

Milk in general (and bovine milk in particular) arguably contains more growth factors than any other single food source. Growth factors are specific proteins which act as intracellular signaling molecules. Scientists in Japan have isolated a fraction from whey protein which they have determined to have positive metabolic effects on bone health. It is called Milk Basic Protein, or MBP®, and it is the active ingredient in Advanced Bone Protection from AORTM.
How Does Advanced Bone ProtectionTM Work?

Stated very briefly, MBP stimulates the activity and proliferation of osteoblasts (bone-building cells) while simultaneously suppressing the activity and proliferation of osteoclasts (cells responsible for the resorption – or breakdown – of bone). MBP is particularly effective at supporting the production of collagen as well as the retention of calcium (see below).

At first glance, the mechanism of action through which MBP exerts its effects seems remarkably similar to that of its bone-enhancing nutrient predecessors such as calcium, vitamin D and strontium. For example, MBP assists in the absorption and retention of calcium, just as vitamin D does. Unlike vitamin D, however, MBP does so via the inhibition of cystein protease due to the presence of the protein strain known as cystatin C, which is part of the structure of MBP itself. Cystatin C also inhibits the release of calcium from bones stimulated by thrombin, interleukin-1 and prostaglandin E2. The essential nature of this function cannot be understated, as calcium can metaphorically be referred to as the mortar for the infrastructure that is collagen – together contributing to form the complex that is bone.

Cystein protease also digests collagen in the bone matrix, further testimony to the benefit of its inhibitory effect from the cystatin C contained in MBP. MBP cultivates both the proliferation and activity of the bone-building osteoblasts while conversely bridling the same proliferation and activity among the osteoclasts responsible for the resorption (breakdown) of older bone tissue. Even more revealing is the extent of MBP’s inhibition of osteoclasts, suppressing the activity of even the most isolated osteoclast cells. The association between the osteoblast/osteoclast relationship and collagen lies in the ability of osteoblasts to produce collagen, and it is here where MBP comes into its own. The ability to specifically manipulate osteoblasts into producing more collagen in a manner that is more pronounced than that of its osteo-nutrient predecessors is an additional factor that makes MBP unique. Furthermore, MBP also increases serum concentrations of osteocalcin (BGP, also called Gla protein), which is the major non-collagenous protein in bone.

Research

Science In Action: What The Studies Say

As with all promising nutraceutical innovations, early in-vitro research revealed encouraging indications of what would later become identified as MBP. Indeed, such indications at the in-vitro level need to be encouraging in order to secure further, in-vivo studies. This preliminary research identified whey protein as having an exemplary influence on the relationship between osteoblasts and osteoclasts. It was discovered that in addition to fortifying osteoblasts, whey protein was also shown to suppress osteoclast-mediated bone resorption and osteoclast cell formation. This began a lengthy scientific process to isolate the fraction of whey protein that scientists believed was responsible for these bone-reinforcing effects. MBP was the eventual result of that process.

The recent scientific isolation and practical procurement of MBP has lead to numerous studies with excitingly impressive results. The first study among humans involved thirty-three healthy women who were randomly assigned to treatment with either a placebo or MBP (40 mg per day) for six months. The bone mineral density (BMD) of the left heel bone of each subject was measured at the beginning of the study and at the end. Serum and urine indices of bone metabolism were measured at the base line, three month intervals, and again at the end of the study. When standard BMD testing was
conducted at the end of the study, the women in the MBP group gained approximately 70% more bone mineral density than the control group. Furthermore, urinary markers of bone loss – in this case, cross-linked type-I collagen/creatinine and deoxypyridinoline/creatinine, were ‘significantly decreased’ in the MBP group.

A study among healthy adult men was similarly impressive, as well as another study among healthy adult women in 2002. This particular double-blind, placebo-controlled trial measured radial bone mineral density, and once again the mean BMD value of the MBP group was ‘significantly higher’ than that of the placebo group.

A Summary of the Results of MBP Studies:

In a study among healthy menopausal women, the MBP group reported a bone mineral density (BMD) increase of 1.21% while the placebo group recorded a 0.66% BMD decrease.

In another study among healthy adult women, the MBP group gained approximately 70% more bone mineral density than the control group.

MBP reduced the number of pits on the bone surface caused by bone resorption by approximately 85% in an in-vitro study.

In yet another study among healthy adult females, the MBP group displayed a 3% increase in the BMD of the radius (a forearm bone near the wrist) compared to a 1.3% BMD decrease in the placebo group.

Finally, the MBP in Advanced Bone ProtectionTM from AOR comes in small, convenient capsules that can be taken with or without food and have no interactions with calcium or any other nutrients.

Market Trends

Those who are wishing to improve their bone health will significantly benefit from using bone supporting products such as vitamins and mineral, lactoferrin and milk basic protein.

AOR Advantage

Advanced Bone Protection works on several mechanisms: first, by reducing the activity of bone destroying cells called osteoclasts; second, by stimulating the activity of bone forming cells called osteoblasts; third, by increasing the amount of collagen produced by the osteoblasts and laid down in the bone; and finally, by improving the utilization of calcium ions into the bone. The last mechanism makes Advanced Bone Protection unique in its action by virtually “catching” as many calcium ions as possible thereby preventing the deposition of calcium in other tissues like the arteries, kidneys and others. Advanced Bone Protection concentrates in the bone and acts like Velcro and thus picks up calcium ions which can’t help but “stick” to the bone which is where they are needed.

References

Aoe S, et al. A controlled trial of the effect of milk basic protein (MBP) supplementation on bone


Abstract

Interactive effects of milk basic protein supplements and habitual physical activity on bone health in older women: A 1-year randomized controlled trial.


A 1-year randomized controlled trial examined effects of milk basic protein (MBP) supplementation (40 mg day⁻¹) and daily physical activity (step count and duration of exercise > 3 metabolic equivalents [METs]) on bone metabolism, forearm bone mineral density (BMD) and a calcaneal osteosonic index (OSI) in 79 females aged 65–86 years. MBP did not affect osteocalcin or bone-specific alkaline phosphatase, but at 12 months, excretion of deoxypyridinoline and cross-linked N-teleopeptides of type I collagen (NTx) were significantly less than in controls. Experimental subjects also maintained BMD and had a 1.5% increase of OSI at 12 months. After adjustments for age and baseline bone parameters, osteocalcin, deoxypyridinoline, NTx and/or OSI at 12 months were significantly related to step count and/or duration of activity > 3 METs. MBP reduced markers of bone loss, particularly in the lower extremities. Reduced resorption of bone was also associated with moderate-intensity/duration exercise, MBP therapy interacting significantly with habitual physical activity.
Milk basic protein increases bone mineral density and improves bone metabolism in healthy young women.


Uenishi K, Ishida H, Toba Y, Aoe S, Itabashi A, Takada Y.

Effect of milk basic protein on bone metabolism in healthy young women.

INTRODUCTION: Milk has more beneficial effects on bone health than other food sources. Recent in vitro and in vivo studies have shown that milk whey protein, especially its basic protein fraction (milk basic protein, MBP), contains several components capable of promoting bone formation and inhibiting bone resorption. The object of this study was to examine the effect of MBP on the bone mineral density and bone metabolism of healthy young women.

METHODS: Thirty-five healthy young women were randomly assigned to treatment with either placebo or MBP (40 mg per day) for 6 months. The bone mineral density (BMD) of the lumbar vertebrae L2-L4 of each subject was measured by dual-energy X-ray absorptiometry (DXA) at 0 and 6 months of treatment. Serum and urine indexes of bone metabolism were measured at 0, 3 and 6 months. All subjects completed the study in accordance with the protocol.

RESULTS: The mean rate of gain of lumbar BMD in the MBP group (1.57%) was significantly higher than in the placebo group (0.13%, P=0.042). When compared with the placebo group, urinary cross-linked N-telopeptides of type-I collagen (NTx) were significantly decreased, and serum osteocalcin was significantly increased in the MBP group at 6 months.

CONCLUSION: These results suggested that MBP supplementation was effective in increasing BMD in young women and that this increase in BMD may be primarily mediated through the promotion of bone formation and inhibition of bone resorption by MBP supplementation.

Milk basic protein increases alveolar bone formation in rat experimental periodontitis.


Seto H, Toba Y, Takada Y, Kawakami H, Ohba H, Hama H, Horige M, Nagata T.

BACKGROUND AND OBJECTIVE: It is conceivable that the active components extracted from milk whey protein (i.e. milk basic protein, MBP) stimulate bone formation and suppress bone resorption. Periodontitis is characterized by excessive alveolar bone resorption. We examined whether milk basic protein could recover alveolar bone loss in rat experimental periodontitis.

MATERIAL AND METHODS: A nylon ligature was placed around the cervix of molars in 8-wk-old male Fischer rats for 20 d. Then, the ligature was removed and a powder diet containing 0.2 or 1.0% milk basic protein was provided daily for another 45-90 d. On days 45 and 90, the maxillae were extracted and analyzed using microcomputerized tomography (micro-CT), followed by histological analysis.

RESULTS: Micro-CT images showed that alveolar bone resorption was severely induced around the molar by the 20-d ligature procedure. Treatment with high-dose milk basic protein (1.0%) clearly recovered ligature-induced alveolar bone resorption on days 45 and 90, whereas low-dose milk basic
protein (0.2%) did not show such a clear effect. Histological examination clarified that the osteoid thickness of alveolar bone was dose dependently increased by milk basic protein treatment for 90 d.

CONCLUSION: These findings suggest that a systemic administration of milk basic protein may be effective for the recovery of alveolar bone loss in periodontitis.

Prevention of osteoporosis by foods and dietary supplements. Milk basic protein (MBP) induces alveolar bone formation in rat experimental periodontitis.


Seto H, Nagata T.

Periodontitis is a chronic inflammatory disease caused by infection of periodontopathic bacteriae, which induced alveolar bone resorption. Milk basic protein (MBP) has been reported to be useful as a supplement because of increasing bone formation in animal and human studies. We examined the effect of MBP for alveolar bone formation in rat experimental periodontitis. After alveolar bone resorption was induced by ligature technique, the diets containing low and high dose of MBP were given to rats for 90 days. Micro-focus computed tomography and histological observation revealed a recovery of alveolar bone in high-dose MBP group compared to the control group. Osteoid thickness of alveolar bone crest significantly increased in low and high-dose MBP groups. These findings indicate that MBP may be effective for the recovery of alveolar bone resorption in periodontitis.

Prevention of osteoporosis by foods and dietary supplements. “Mainichi Hone Kea MBP”: A foods for specified health uses (FOSHU) product containing MBP that has an effect to increase bone density.


Toba Y, Takada Y.

“Mainichi Hone Kea MBP” is a foods for specified health uses (FOSHU) product. It has been approved to write the next claim, “This product is suitable for those who care about bone health, because it contains MBP that has an effect to increase bone density”, on this product. MBP is a complex of protein with a basic isoelectric point in milk protein. It has been shown that MBP promotes bone formation, suppresses bone resorption, increases bone mineral density, and increases bone strength in in vitro and in vivo studies. And, we also examined the effect of MBP in healthy adult women from twenties to fifties. A beverage containing MBP or a placebo beverage without MBP was given to volunteers for six months. The percentage increase of radial bone density was significantly higher in the MBP group than in the placebo group. This result has confirmed that MBP contributes to increased bone density in humans. To sum up, we believe that MAINICHI HONE KEA MBP, which contains MBP that has an effect to increase bone density, contributes to bone health.