Bromelain is not actually a single substance, but rather a collection of protein-digesting enzymes (also called proteolytic enzymes) found in pineapple juice and in the stem of pineapple plants. It is primarily produced in Japan, Hawaii, and Taiwan, and much of the original research was performed in the first two of those locations. Subsequently, European researchers developed an interest, and, by 1995, bromelain had become the thirteenth most common individual herbal product sold in Germany.

What Is Bromelain Used for Today?

Bromelain (often in combination with other proteolytic enzymes) is used in Europe to aid in recovery from surgery and athletic injuries, as well as to treat sinusitis and phlebitis.

Other proposed uses of bromelain include chronic venous insufficiency (closely related to varicose veins), hemorrhoids, other diseases of the veins, bruising, rheumatoid arthritis, gout, ulcerative colitis, and dysmenorrhea (menstrual pain). However, there is no real evidence that bromelain is effective for these conditions. One study failed to find bromelain effective for osteoarthritis.

Bromelain is definitely useful as a digestive enzyme. Unlike most digestive enzymes, bromelain is active both in the acid environment of the stomach and the alkaline environment of the small intestine. This may make it particularly effective as an oral digestive aid for those who do not digest food properly.

Bromelain may also increase the absorption of various drugs, particularly antibiotics such as amoxicillin and tetracycline. This could offer both risks and benefits.

Bromelain is widely available in groceries as a meat tenderizer.

What Is the Scientific Evidence for Bromelain?

While most large enzymes are broken down in the digestive tract, those found in bromelain appear to be absorbed whole to a certain extent. This finding makes it reasonable to suppose that bromelain can actually produce systemic (whole body) effects. Once in the blood, bromelain appears to reduce inflammation, "thin" the blood, and affect the immune system. These influences may be responsible for some of bromelain's therapeutic effects.
Injury and Surgery

The evidence for bromelain as a treatment for injuries and surgeries is mixed.

A double-blind, placebo-controlled study evaluated 160 women who received episiotomies (surgical cuts in the perineum) during childbirth. Participants given 40 mg of bromelain 4 times daily for 3 days, beginning 4 hours after delivery, showed a statistically significant decrease in edema, inflammation, and pain. Ninety percent of patients taking bromelain demonstrated excellent or good responses compared to 44% in the placebo group. However, another double-blind study of 158 women who received episiotomies failed to find significant benefit.

In a double-blind controlled trial, 95 patients undergoing treatment for cataracts were given 40 mg of bromelain or placebo (along with other treatments) 4 times daily for 2 days prior to surgery and 5 days post-operatively. Overall, less inflammation was noted in the bromelain-treated group compared to the placebo group.

Benefits were also seen in double-blind, placebo-controlled studies of dental, nasal, or foot surgery. However, a study of 154 people undergoing facial plastic surgery found no benefit.

A somewhat informal controlled study of 146 boxers suggested that bromelain helps bruises to heal more quickly. Another study—this one without any type of control group—found that bromelain reduced swelling, pain at rest, and tenderness among 59 patients with blunt trauma injuries, including bruising.

People who engage in intense exercise to which they are not accustomed may experience a set of symptoms called delayed onset muscle soreness (DOMS), consisting of pain, reduced flexibility, and weakness of the muscles involved. Bromelain has been proposed for this condition, but a small double-blind, placebo-controlled study failed to find it effective.

Sinusitis

In a double-blind trial, 48 patients with moderately severe to severe sinusitis received bromelain or placebo for 6 days. All patients were placed on standard therapy for sinusitis, which included antihistamines, analgesics, and antibiotics. Upon completion of the study, inflammation was reduced in 83% of those taking bromelain compared to 52% of the placebo group. Breathing difficulty was relieved in 78% of the bromelain group and 68% of the placebo group. Overall, good to excellent results were observed in 87% of patients treated with bromelain compared to 68% on placebo.

Benefits were also seen in two other studies enrolling a total of more than 100 individuals with sinusitis.

Dosage

Recommended dosages of bromelain vary with the form used. Due to the wide variation, we suggest following label instructions.

Safety Issues

Bromelain appears to be essentially nontoxic, and it seldom causes side effects other than occasional mild gastrointestinal distress or allergic reactions.
However, because bromelain "thins" the blood to some extent, it shouldn't be combined with drugs such as warfarin (Coumadin) without a doctor's supervision.

According to one small animal study, bromelain might interact with sedative medications, increasing their effect. As noted above, it might also increase blood levels of various antibiotics, which could present risks in some cases. In addition, one trial suggests that doses of bromelain eight times higher than standard recommendations might increase heart rate (but not blood pressure).

Safety in young children, pregnant or nursing women, or those with liver or kidney disease has not been established.

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**Interactions You Should Know About**

- If you are taking medications that thin the blood, such as warfarin (Coumadin) or heparin, sedative drugs such as benzodiazepines, or antibiotics: Bromelain might amplify their effect.

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**References [+]**


42. Moss JN, Frazier CV, Martin GJ. Bromelains. The pharmacology of the enzymes. *Arch Int Pharmacodyn Ther.* 1963;145:166-188.


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Last reviewed August 2011 by EBSCO CAM Review Board
Last Updated: 8/1/2011