

# Bromelain

## Applications

- Joint Health Support
- Protein Digestion
- Healthy Inflammatory Response Support



## Introduction

**NutraMedix Bromelain** is made from pineapple stems (*Ananas comosus*). Pineapple belongs to the Bromeliaceae family,<sup>1</sup> and bromelain is a general term for proteolytic enzymes found in pineapple. In addition to proteolytic enzymes, bromelain contains protease inhibitors, minerals, organic solvents, and organic acids.<sup>2</sup>

The proteolytic enzymes in **bromelain** help break down larger proteins into shorter peptides by hydrolyzing peptide bonds. This mechanism may support multiple facets of health.<sup>3</sup> In vitro studies have shown that bromelain is highly bioavailable, attributed to its ability to bind to alpha1-antichymotrypsin and alpha 2-macroglobulin in the blood.<sup>4</sup>

**NutraMedix Bromelain** is free of gluten, dairy, and soy. NutraMedix rigorously follows current good manufacturing practices (cGMP), as do our suppliers, including stringent ID testing, microbial testing, and heavy-metal testing. This testing is conducted on both the raw material and after encapsulation.

## Joint Health Support

**Bromelain** helps support joint health.<sup>5</sup> It helps maintain substance P, PGE-2, and bradykinin already within the normal range, maintaining joint comfort.<sup>1,4</sup> It may also help maintain levels of TGF-beta already within the normal range.<sup>4</sup>

In an open, parallel, dose-finding study, 77 healthy participants with mild knee discomfort of less than 3 months were randomly assigned to either 200 or 400 mg of bromelain per day for 30 days. At the end of the study, both bromelain groups experienced significant support as quantified by a standardized scale, with support being dose-dependent.

In a double-blind study, 90 participants with hip discomfort were randomly assigned to either proteolytic enzymes (bromelain and trypsin plus rutin) or a positive control. At the end of 6 weeks, both groups experienced comparable and significant support for hip-joint comfort and function.<sup>6</sup>

In a single-blind, controlled pilot study, 40 participants with mild knee discomfort were randomly assigned to 500 mg of bromelain per day or a positive control. After 4 weeks, participants in both groups experienced similar support for joint comfort, flexibility, and function as measured by standardized scales. There were no significant differences between groups.<sup>7</sup>

## Protein Digestion

**Bromelain** may help with the digestion of dietary protein, as shown in a mouse study.<sup>8</sup> It may also help with proteolytic support in tissue healing.<sup>9</sup> Bromelain may help maintain the normal transformation of plasminogen to plasmin, which maintains healthy fibrin levels already within the normal range.<sup>1,9</sup>

Bromelain may help maintain factor X and prothrombin levels already within the normal range.<sup>4</sup> In addition, it may help support healthy platelet aggregation and help maintain plasma kinin levels already within the normal range.<sup>3</sup>

In a double-blind, controlled study, 28 healthy post-periodontal procedure patients were randomly assigned to 1 gram of bromelain per day or a placebo. After 7 days, compared to the control group, the bromelain group had statistically significant support for gum healing as measured by probing.<sup>10</sup>

## Healthy Inflammatory Response Support

**Bromelain** may support a healthy inflammatory response through a variety of mechanisms.<sup>1</sup>

Bromelain may help support healthy function of the kallikrein-kinin pathway, maintaining plasma fibrinogen levels, blood bradykinin levels, and serum fibrolytic activity already within the normal range.<sup>11</sup> It may help support normal function of the arachidonic-acid pathway, maintaining prostaglandins already within the normal range.<sup>11</sup> It may also help maintain nuclear factor kappa-B (NF-kappaB) and MAPKs-signaling pathway activity already within the normal range.<sup>12</sup>

In addition, bromelain may help maintain neutrophil migration already within the normal range.<sup>11,13</sup> Specifically, bromelain may help maintain levels of prostaglandin E<sub>2</sub>; cyclooxygenase-2; thromboxane A<sub>2</sub>; interleukins 1, 6, 8, and 12; and TNF-alpha already within the normal range.<sup>1,3,4,14</sup>

For exercise support, bromelain may help maintain normal muscle strength and support

a healthy inflammatory response following vigorous exercise.<sup>14,15</sup>

In one study, 15 elite cyclists with an average age of 22 years were randomly assigned to 1,000 mg of bromelain per day or a placebo over a 6-day competition. Compared to the placebo group, individuals in the bromelain group experienced significant support for energy levels during the race.<sup>1</sup> In addition, those in the bromelain group experienced a trend toward supporting normal testosterone levels during the race.<sup>1</sup> There were no significant differences in CK, LDH, or myoglobin concentrations between groups.<sup>15</sup>

## Safety and Cautions

**Bromelain** is generally well tolerated and has been used in doses up to 240 mg daily for up to 1 year.<sup>16</sup> It is generally recognized as safe (GRAS) by the U.S. Food and Drug Administration.<sup>17</sup> The most common adverse effects are gastrointestinal and may include abdominal pain, nausea, vomiting, and diarrhea.<sup>16</sup> Dizziness and lethargy have been reported in higher doses.<sup>1</sup>

When taken with anticoagulant and antiplatelet medications, bromelain may have additive effects.<sup>16</sup> Theoretically, bromelain may increase levels of tetracycline antibiotics when taken concurrently.<sup>16</sup> Hypersensitivity reactions have been reported, particularly in individuals with existing allergies to related proteins such as latex or birch pollen.<sup>1,18</sup>

Safety is not documented in breastfeeding or pregnant women, or in children under age 3, due to insufficient safety research.

\*This statement has not been evaluated by the Food and Drug Administration. This product is not intended to treat, cure, or prevent any diseases.

## References

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<sup>2</sup>Rathnavelu, V., Alitheen, N.B., et al. (2016). *Biomedical Reports*, 5(3), 283-288.  
<sup>3</sup>Maurer, H.R. (2001). *Cellular and Molecular Life Sciences*, 58(9), 1234-1245.  
<sup>4</sup>Varilla, C., Marcone, M., et al. (2021). *Foods*, 10(10), 2249.  
<sup>5</sup>Walker, A.F., Bundy, R., et al. (2002). *Phytomedicine*, 9(8), 681-686.  
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<sup>12</sup>Insuan, O., Janchai, P., et al. (2021). *Current Issues in Molecular Biology*, 43(1), 93-106.  
<sup>13</sup>Agrawal, P., Nikhade, P., et al. (2022). *Cureus*, 14(8), e27876.  
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<sup>15</sup>Shing, C.M., et al. (2016). *European Journal of Sport Science*, 16(2), 206-212.  
<sup>16</sup>NatMed Pro. (2023). Bromelain [monograph]. <http://naturalmedicines.therapeuticresearch.com>  
<sup>17</sup>Food and Drug Administration (FDA). (2023). *CFR - Code of Federal Regulations Title 21*. [accessdata.fda.gov/scripts/cdrh/cfdocs/cfcr/CFRSearch.cfm?fr=184.1024](https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcr/CFRSearch.cfm?fr=184.1024)  
<sup>18</sup>Popescu F.D. (2015). *World Journal of Methodology*, 5(2), 31-50.

**NutraMedix** 

**SUGGESTED USE:** Take one to two capsules one to two times daily (at least 30 min. before meals) with a full glass of water or as directed by your physician. Do not exceed recommended dosage. Do not use if taking blood platelet inhibitors such as Ticlid, Plavix, Coumadin or similar prescription medications. Do not use if pregnant or nursing. Stop use if adverse reactions develop. Keep out of reach of children.

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**Dietary Supplement**  
60 Vegetable Capsules

# BROMELAIN

SUPPORTS JOINT HEALTH  
AND PROTEIN DIGESTION †

## Supplement Facts

Serving Size 2 Capsules  
Servings Per Container 30

Amount Per Serving	% Daily Value
Bromelain (2400 GDU/g) (from pineapple)	1,000 mg*

\*Daily Value (DV) not established

**Other ingredients:** Vegetable Capsule, Vegetable Magnesium Stearate  
**GLUTEN, SOY & DAIRY FREE**

**NutraMedix** 

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