



PRODUCT FACT SHEET

ZYMAIN®

Indicated during the acute phase of treatment for the reduction of inflammation, such as after a strain/sprain or acute disc herniation. Contains plasmin-activating proteolytic enzymes bromelain, papain, trypsin and chymotrypsin that degrade fibrin. Other anti-inflammatory benefits involve reduction or modulation of cyclooxygenase (COX) activity, bradykinin, and inflammatory cytokines.

BACKGROUND

One immediate and important goal of rehabilitation after joint trauma is cessation of inflammation and the return of healing circulation. ZYMAIN supplies four enzymes to break down inflammation barriers and quickly allow entry of the healing agents; cartilage, vitamin C, bioflavonoids, zinc and manganese.

Bromelain, a complex of proteolytic enzymes from pineapples, has been used clinically for decades to reduce post-trauma inflammation and continually grows in acceptance. It displays a multitude of anti-inflammatory activities including inhibition of platelet aggregation and thrombosis with stimulation of fibrinolysis¹. Because active bromelain is derived from a natural source with a long history of human use, it is considered extremely safe. Papain is another enzyme from a plant source (papaya) with a history of safe use. The antiinflammatory activities of papain are somewhat similar to bromelain.

Chymotrypsin and trypsin are very well characterized mammalian, proteolytic enzymes which inhibit platelet aggregation, but the exact, biochemical mechanisms behind their antithrombotic effectiveness are still not completely clear. For instance, chymotrypsin is effective at cleaving platelet membrane surface receptor proteins that bind the key clotinitiating enzyme thrombin²; cleaving this receptor inactivates human platelets which retards blood clotting. Chymotrypsin and trypsin are effective at preventing platelet aggregation, due to cleaving more than one type of platelet membrane receptor³. Since some proteolytic enzymes are themselves cleaved and inactivated in the stomach, we must enteric coat these four to deliver optimum benefit through the intestinal linings into the bloodstream.

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**ANABOLIC
LABORATORIES**

Pharmaceutical Made Nutritional Products Since 1924

ZYMAIN®

ITEM #: 2580

DESCRIPTION

Designed to provide nutrition for healing following trauma and especially to shorten rehabilitation time. This is a combination product formulated to reduce inflammation and support fast tissue repair.

HOW SUPPLIED

As speckled, oblong tablets; 40 or 90 tablets per bottle.

DIRECTIONS

Do not chew. ZYMAIN is designed to be taken immediately after initial injury or exacerbation, to combat the acute inflammatory process. Take two tablets 4 times a day between meals for 5-10 days or as directed by your health care professional.

Supplement Facts		
Serving Size 2 Tablets		Servings Per Container 20
Amount Per Serving		% Daily Value
Vitamin C (from calcium ascorbate)	200 mg	333%
Zinc (from zinc L-monomethionine (L-OptiZinc®))	10 mg	67%
Manganese (from manganese sulfate, manganese gluconate)	4 mg	200%
Bromelain **	200 mg	-
Papain **	100 mg	-
Trypsin **	100 mg	-
Chymotrypsin **	200 mcg	-
Bioflavonoid Complex	200 mg	-
Beef Cartilage	100 mg	-
Shave Grass (source of silicon)	2 mg	-
* Daily Value not established		
** Enteric coated for optimum bioavailability.		





BACKGROUND

ZYMAIN® also provides cartilage extract as support for joint repair. Cartilage glycosaminoglycans are used for reconstructing damaged cartilage by chondrocytes and for biosynthesis of new joint lubrication which undergoes massive turnover during repair of damaged joints.

Increased vitamin and mineral intakes are essential following trauma to stimulate the healing process. Vitamin C is required for the biosynthesis of new collagen, a major component of cartilage, through its role as a substrate for hydroxyproline and hydroxylysine biosynthesis. Vitamin C is also critical in the biosynthesis of L-carnitine, an unusual amino acid required for lipid transport for membrane repair and fat burning (to form ATP and GTP). In addition, vitamin C is required for the proper secretion of collagen from cells once this strong, high molecular weight polymer has been synthesized. Formation of a well-developed, collagen framework is absolutely necessary before chondrocytes can reproduce to cover damaged joint tissues. Lack of chondrocytes in the neighborhood of joint damage is one major reason why our old and injured joints become chronically inflamed and never heal.

Manganese is crucial to the biosynthesis of the mucopolysaccharides that lubricate human joints. It is required by several enzymes that attach sulfates to sugars and these glycosulfates and sulfated polysaccharide products eventually become joint lubricants (and the critically important anti-thrombotic endothelial linings of human arteries and veins). It has been reported that nutritional supplementation with a blend of glucosamine/chondroitin sulfate and manganese ascorbate of arthritic lab animals resulted in significantly reduced severity of this disabling disease⁴. The combination of manganese with vitamin C and the strongly

reducing bioflavonoids makes sense since it is only the reduced, Mn (II), form of this metal which has biological activity. Oxidized Mn (IV) [like oxidized Fe (III)] is not water soluble, both metals bind oxides very tightly and become impossible to transport through plasma to tissues and cells. The trace compound silica, which mimics sulfate in many respects, has also been shown to be important for the proper biosynthesis of connective tissue and is an essential component of the non-thrombotic, heparin lining of artery and venous walls.

Zinc is another essential mineral; serving as a cofactor to over 200 enzymatic reactions and also a critical, structural element for hundreds of other enzymes. As such, Zn has an important role in cell membrane structures and function, respiration (CO₂ transport out of the tissues), digestion, wound healing and in combating infections. Zinc also plays a very fundamental role in all higher organisms; it is an absolute requirement for the biosynthesis of RNA and DNA replication. Indeed, regions called "zinc fingers" exist on many proteins which directly control the rates of DNA and RNA syntheses and hence cell replication and protein transcription. ZYMAIN® contains L-Opti-Zinc®, a patented 1:1 complex of zinc and methionine – an essential amino acid with one of the highest absorption rates of the common twenty. Studies have shown that L-Opti-Zinc® is better absorbed and retained longer than other zinc supplements. Zinc methionine resists binding – sequestering – by dietary fiber and phytate which significantly inhibit Zn absorption via the gut. Phytate is an ensemble of organophosphates that commonly inhibits both Zn and Mg absorption by binding these metals tightly in the gut, preventing transport of these essentials thru the intestinal membranes into the bloodstream.

REFERENCES

1. Maurer, HR (2001). Bromelain: biochemistry, pharmacology and medical use. Cellular and Molecular Life Science 58(9): 1234-1245.
2. Tam, SW, Fenton, JW and Detwiler, TC (1980) Platelet thrombin receptors. Binding of a-thrombin is coupled to signal generation by a chymotrypsin-sensitive mechanism. Journal of Biological Chemistry 255(14): 6626-6632.
3. Liu, L, et al. (1997). Binding of thrombin to the G-protein-linked receptor and not to glycoprotein Ib, precedes thrombin-mediated platelet activation. Journal of Biological Chemistry 272(3): 1997-2004.
4. Beren, J, Hill, SI, Diener-West, M & Rose, NR (2001). Effect of pre-loading oral glucosamine HCl/chondroitin sulfate/manganese ascorbate combination on experimental arthritis.... Experimental Biology & Medicine 266: 144-151.

THE **ANABOLIC DIFFERENCE**

Anabolic Laboratories' nutritional products are made in a registered, licensed and inspected pharmaceutical facility. Our in-house laboratories and manufacturing facilities are routinely inspected by the United States Food and Drug Administration (FDA) and Drug Enforcement Administration (DEA). We also maintain a Good Manufacturing Practice (GMP) certification from the Natural Products Association.

As a pharmaceutical manufacturer, the standards used for raw materials, production and finished product testing exceed FDA requirements for the nutritional products industry. Our pharmaceutical requirements for manufacturing are the foundation for the guaranteed quality of our nutritional products. Anabolic Laboratories sets the nutritional supplement industry standard for label accuracy, potency and purity as dictated by the FDA for pharmaceutical and nutritional products.

