

*Dr. Brimhall's***One More Piece of the Puzzle***For Wellness***Total Green Protein and Inflammation**

- By Dr. John Brimhall and Dr. Lynn Toohey

Whey protein has high **anti-inflammatory potential** and has been utilized to help reduce the inflammation in critically ill trauma patients receiving enteral nutritional support; C-reactive protein concentrations (marker of inflammation) and total inflammatory index dramatically fell in one study (Vehe KL et al. The prognostic inflammatory and nutritional index in traumatized patients receiving enteral nutrition support. J Am Coll Nutr. 1991 Aug; 10(4): 355-63).



Whey has a high **glycomacropeptide** content (GMP). In describing GMP, the Journal of Nutrition reports that the "magnitude of **the anti-inflammatory effect was comparable to that of sulfasalazine**, an established drug used in the treatment of Inflammatory Bowel disease", and that GMP promotes **the growth of bifidobacteria** while inhibiting the proliferation of pathogens and binding to lectins, all of which can increase inflammation (J Nutr 2005; 135: 1164-1170).



Lactobacillus acidophilus and **Lactobacillus bulgaricus** are examples of probiotics, or good gut flora. Probiotics have recently made headlines for their anti-inflammatory potential. In fact, it has been proposed that dysbiosis is a prerequisite to inflammation of the bowel (Tamboli CP, et al. Dysbiosis as a prerequisite for IBD. Gut. 2004 Jul; 53 (7): 1057). Recently, researchers found that **probiotic supplementation significantly reduced inflammation in the colon by the regulation of an immune response** (DiGiacinto C. et al. Probiotic administration during remission of inflammatory bowel disease reduces the severity of recurrent colitis by inducing an immunoregulatory response. 2005; 174: 3237-46).

*Probiotics should be taken away from meals, or enteric-coated if taken with food to optimize colonization in the large intestine.

Antioxidants can reduce the age-related increase in pro-inflammatory cytokines (Gemma C. Diets enriched in foods with high antioxidant activity reverse age-induced decreases in cerebellar beta-adrenergic function and increases in proinflammatory cytokines. J Neurosci. 2002 Jul 15; 22(14): 6114-20.) They also reduce pro-inflammatory free radicals, especially the superoxide radical. Bioflavonoids, found in many plant sources, are anti-inflammatory and possess high antioxidant activity. **Papaya and rose hips**, both rich in phytochemicals, are two of the few plant substances containing **high amounts of the potent antioxidant lycopene** (Mourvaki E, et al. 2005).

Anti-inflammatory, natural cox-2 inhibitors: Cyclooxygenase-2 (COX-2) is the enzyme that causes inflammatory substances to be produced in the body and is also the enzyme targeted by the cox-2 inhibitor drugs (some of these drugs were pulled from the market).

Inflammation Support Drink:

1 cup rice milk
1/2 banana
1 cup berries
Ice cubes
1 serving Total Green Protein* powder
2-3 tablets Total Inflamm*
Blend well and serve



Any berries, preferably organic, can be used. Dark colored fruits are high in anti-inflammatory bioflavonoids and antioxidants.

*Total Green Protein is a Nutri-West whey protein powder high in phytochemicals, bioflavonoids and antioxidants; it contains spirulina, enteric-coated probiotics, rosemary, beta-sitosterol and an 18% glycomacropeptide content, all of which have a positive effect on inflammatory processes.

*Total Inflamm is a Nutri-West herbal formula containing the cox 2 inhibitors curcumin, ginger, boswellia and quercetin.

The following nutrients inhibit cox-2 naturally:

Rosemary decreases inflammation and liver cell injury (Sotelo-Felix JJ, et al. J Ethnopharmacol. 2002 Jul;81(2): 145-54.) Carnosol, a component of rosemary, is a **potent inhibitor of cox 2** (Subbaramaiah K, Cole PA, Dannenberg AJ. Retinoids and carnosol suppress cyclooxygenase-2 transcription...Cancer Res. 2002 May 1;62(9):2522-30) and together with rosmannol, and epirosmannol (also components of the rosemary herb), demonstrate high antioxidant activity, which is also anti-inflammatory.

Beta Sitosterol is a plant sterol possessing **anti-inflammatory properties** (Bouic PJ et al. Monograph. Plant sterols and sterolins. Altern Med Rev. 2001 Apr;6(2):203-6). **Beta-sitosterol decreases the inflammatory PGE2 prostaglandin by altering the cox-2 enzyme** (Awad AB et al. Prostaglandins Leukot Essent Fatty Acids. 2004 Jun;70:511-20).

Spirulina is a particularly rich source of proteins, vitamins, amino acids, minerals, and other nutrients that has been proven to be, "effective to treat certain allergies, immunodeficiency, and **inflammatory processes**", among other things (Chamorro G. et al. 2002 Sep;52(3):232-40.) Some researchers have proposed using spirulina for allergic rhinitis because it lowers histamine and total IgE (Chen LL et al. Experimental study of spirulina platensis in treating allergic rhinitis in rats. Zhong Nan Da Xue Xue Bao Yi Xue Ban. 2005 Feb;30(1):96-8). C-Phycocyanin (C-PC) is one of the major biliproteins of Spirulina, with antioxidant and radical scavenging properties. It exhibits anti-inflammatory properties by **selectively inhibiting COX-2** (Reddy MC Biochem Biophys Res Commun. 2003 May 2;304(2):385-92) and the inflammatory PGE2 (Romay et al. Arzneimittelforschung. 2000 Dec;50(12):1106-9), and has been reported to have an "**anti-arthritis effect**" (Remirez D et al. Inhibitory effects of Spirulina in zymosan-induced arthritis in mice. Mediators Inflamm. 2002 Apr;11(2):75-9.)

Curcumin is a natural substance that decreases Cox-2 (Carcinogenesis. 2004 Apr 8), as well as ginger. In fact, researchers suggest that ginger, "offers a complementary and **alternative approach to modulate the inflammatory process** involved in arthritis" (In Vitro Cell Dev Biol Anim. 2004 Mar-Apr;40(3-4):95-101). **Boswellia** appears to have an influence on the eicosanoid pathway and Cox 2 as well (Integr Cancer Ther. 2002 Mar;1(1):7-37). Another natural ingredient, **quercetin**, has also been "found to effectively **suppress the COX-2 promoter**

activity" (Carcinogenesis, Vol. 21, No. 5, 959-963, May 2000).

To your health!

JW Brimhall, DC and the Wellness Team

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