



*The taste you love, the nutrition you want.*

## Inflammation

Inflammation is the body's first response to an illness or injury and is a process whereby the body's white blood cells and chemicals help prevent infection, bacteria and viruses. Acute inflammation is the basis of a healthy immune system and the crucial first step in fighting infection and healing wounds. However, when inflammation is continuously activated, otherwise known as chronic inflammation, people are more susceptible to chronic disease and illness.

Chronic inflammation disrupts normal functions of cells and is usually silent, invisible and persistent. Many diseases are associated with chronic low-grade inflammation triggered and sustained by oxidative stress.<sup>1 2</sup>

Some causes of chronic inflammation are environmental pollutants, genetic predisposition and lifestyle factors. Poor diet, chronic stress, lack of sleep and smoking promote inflammation. All age-related diseases—including cardiovascular disease, diabetes and cancer—have their roots in inflammation. Vascular disease begins as an inflammatory process and Alzheimer's disease results from inflammation of the brain.

An animal study performed at the University of Rhode Island found that natural ingredients in raspberries may be able to ease the debilitating effects of inflammation-related arthritis and joint pain.<sup>3</sup> In the course of their investigation, scientists discovered that substances in red raspberries (anthocyanins and other polyphenolic compounds) can block arthritis-related inflammation in much the same way that aspirin and non-steroidal anti-inflammatory drugs (NSAIDs) do. Lead researcher Navindra Seeram explained additional research on

human subjects is needed, and it is possible that this research will reveal that regular consumption of raspberries can may help in protecting cartilage and preventing or delay the onset of arthritis.

Raspberries are a rich source of several anthocyanin compounds. The synergistic effect of these compounds can exerts a strong anti-inflammatory response. A study of 150 people found anthocyanins to raise good cholesterol (HDL) and reduce bad cholesterol (LDL).<sup>4</sup>

One common medical intervention for certain types of inflammation, including arthritis, is the use of NSAIDS. These drugs work by blocking two enzymes, cyclooxygenase-1 (COX-1) and 2 (COX-2), produced by the body and associated with inflammation. As a result of treatment by NSAIDS, the body doesn't feel pain or become inflamed. NSAIDS can also play a protective role against Alzheimer's disease; however, this pharmacological intervention can have serious side effects, including gastrointestinal and cardiovascular disruptions. Researchers are increasingly interested in finding whole food, plant-based diets—including raspberries—that may help manage and/or prevent chronic inflammation. As the research continues to grow and reveals more evidence of the anti-inflammatory effects of diet, one future outcome could eventually be to reduce and/or replace the widespread use of NSAIDS.

Serving suggestions and health and nutrition information can be found at:

[redrazz.org](http://redrazz.org)

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<sup>1</sup><http://www.ars.usda.gov/is/AR/archive/apr09/plants0409.htm>

<sup>2</sup><http://www.ars.usda.gov/News/docs.htm?docid=19563>

<sup>3</sup>Jean-Gillesd et al. Anti-inflammatory effects of polyphenolic-enriched red raspberry extract in an antigen induced arthritis rat model. J Agric Food Chem 2012 Jun 13;60(23):5755-62

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<sup>4</sup> Qin Y et al. Anthocyanin supplementation improves serum LDL and HDL cholesterol concentrations associated with the inhibition of cholesteryl ester transfer protein in dyslipidemic subjects. Am J Clin Nutr 2009 Sept;90(3) 485-92