

THE HEALTH EFFECTS OF ASTAXANTHIN AS A FOOD INGREDIENT

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ABSTRACT

Astaxanthin is detected in a variety of living organisms, most of which are found in the seas; in varying concentrations in single-celled microalgae, plankton, krill, salmon, trout and crustaceans, including crayfish and shrimp as sea food. It gives the latter their reddish color also found in some fungi. Astaxanthin has both lipophilic and hydrophilic properties. Its red color is due to the conjugated double bonds in the center of the compound. The conjugated double bond it possesses donates electrons and reacts with free radicals, turning them into more stable products. In this way, it acts as a powerful antioxidant by ending the free radical chain reaction. The antioxidant activity of astaxanthin was determined to be 10 times higher than zeaxanthin, lutein, cantaxanthin, β -carotene and 100 times higher than α -tocopherol; oxidant-scavenging effect is 800 times higher than coenzyme Q10 and 550 times than vitamin E. It inhibits lipid peroxidation. Its anti-inflammatory, antidiabetic, protection against cardiovascular diseases, anticancer, immune system regulatory effects are monitored in different experimental researches. The following results were obtained with some experimental studies using astaxanthin: In diabetic rats treated with astaxanthin, it was determined that astaxanthin reduced hyperglycemia and decreased lipid peroxidation caused by inflammatory proteins COX-2, iNOS, MCP-1, NF- β and ROS. Astaxanthin administration has been shown to protect the heart muscle in experimental cardiac ischemia-reperfusion injury. In the model of lung injury with cecal ligation and perforation, application of astaxanthin was found to alleviate oxidative/nitrative stress, reduce inflammation levels in lung tissues and pulmonary apoptosis. It was also determined that this treatment significantly reduced the mortality rate in mice. In an experimental myocardial infarction study in Sprague-Dawley rats, three different doses of astaxanthin administered in four days resulted in significant improvements. Astaxanthin has a positive chemotherapy effect in melanoma with lung metastases in vivo. It has been proven for the first time that an antioxidant in nanoparticle application improves lung metastatic melanoma. As a result, astaxanthin, which is a natural food product, is important as a component that can be used for treatment in pathological processes with its structural and functional properties and can show protective properties before various pathologies.

Keywords: Astaxanthin, anti-inflammatory, antioxidant, oxidative stress, sea food