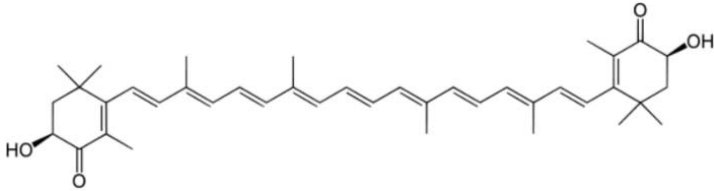


## Astaxanthin 10 mg

### TECHNICAL SUMMARY

Astaxanthin is a member of the carotenoid family derived from non-GMO *Haematococcus pluvialis* microalgae. Due to its unique chemical structure, astaxanthin can stabilize cellular and mitochondrial membrane structures and thus protect them against free radical attack, originating both inside and outside of the cell.\*

#### Structure Formula:



**Chemical Name:** Astaxanthin (3,3'-Dihydroxyl-β,β-carotene-4,4'-dione).

**Allergens and Additive Disclosure:** Not manufactured with wheat, gluten, milk, egg, fish, or shellfish ingredients. Produced in a GMP facility that processes other ingredients containing these allergens. Mixed tocopherols from non-GMO soy and sunflower.

**Delivery Form:** Softgels

### ROLE AS NUTRIENT/FUNCTION

Astaxanthin has pleiotropic biochemical properties and it may be incorporated into cellular membranes where it acts as an electron donor.\* It has been shown to be a stronger lipid peroxidation inhibitor than other carotenoids such as zeaxanthin, lutein, canthaxanthin, and β-carotene.\* Astaxanthin is able to scavenge reactive oxygen and nitrogen species (ROS and NOS) resulting in the suppression of nuclear factor-κB, inhibition of nitric oxide synthase and cyclooxygenase-2 in cells involved in the response of the immune system to normal environmental stress.\*

### NATUROKINETICS®

**Liberation:** Dissolution of the softgel capsule is tested in water using a USP testing method with dissolution occurring between zero and 60 minutes.

**Absorption:** Absorption of oral astaxanthin occurs in the intestine via passive diffusion, usually requiring that the carotenoid first undergo enzymatic esterification. This process allows astaxanthin to be taken up into enterocytes and to be subsequently released into the lymphatic system. Absorption and bioavailability are limited by the highly lipophilic properties of astaxanthin. To increase absorption and bioavailability, it is recommended that it be taken with a fat-containing meal as shown in a clinical study in healthy volunteers. In this study, volunteers received a single dose of 40 mg astaxanthin administered in a capsule in an oil-based carrier or the same dose administered in a capsule with no carrier. Results showed a significantly increase in astaxanthin concentration when it was administered in oil (Fig. 1).

**Distribution:** Astaxanthin is predominantly carried in esterified form with plasma lipoprotein complexes. Preclinical research has shown that

## Supplement Facts

Serving Size 1 Softgel

	Amount Per Serving	% Daily Value
Calories	5	
Natural Astaxanthin (from <i>Haematococcus pluvialis</i> Extract)	10 mg	†

† Daily Value not established.

Other ingredients: Organic Extra Virgin Olive Oil, Softgel Capsule (bovine gelatin, glycerin, water), Natural Mixed Tocopherols and Sunflower Oil.

- **Potent Free-Radical Scavenger\***
- **Cellular Protection\***

**SUGGESTED USAGE:** Take 1 softgel daily, or as directed by your healthcare practitioner.

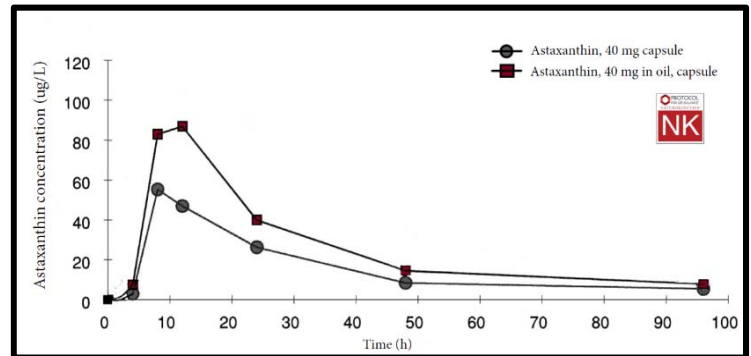


Fig. 1. Plasma astaxanthin concentration-time profiles in healthy volunteers (mean values, n=8) following single oral administration of astaxanthin in 2 different formulations.

astaxanthin is predominantly found in the spleen, kidneys, adrenals, liver, skin, and eyes.

**Metabolism:** In *in vivo* and *in vitro* studies, metabolism of astaxanthin has been shown to occur in the liver by hepatocytes mainly through CYP3A4 and CYP2B6.<sup>1</sup>

**Elimination:** Biliary excretion is predominant, followed by urinary elimination. The half-life of astaxanthin in human volunteers is about 16 h after oral administration.

### CLINICAL VALIDATION

- In a placebo-controlled clinical trial, 24 volunteers (average 28 y.o.) consuming astaxanthin at doses of 1.8, 3.6, 14.4, and 21.6 mg per day for 14 days. No other changes were made in the diet. Fasting venous blood samples were taken at days 0 and 14. Susceptibility of LDL to oxidation was measured as LDL lag time. LDL lag time was significantly longer in all astaxanthin groups as compared with day 0 (5.0, 26.2,

42.3, and 30.7%, respectively, with the increasing dose of astaxanthin administered) and no differences were shown in the control group from day 0 to 14.\*

- In a double-blind, placebo-controlled clinical trial involving 20 healthy individuals, astaxanthin supplementation (8 mg/day for 3 weeks) resulted in significantly lower delayed onset muscle soreness following a standardized exercise challenge ( $p < 0.05$ ).\* The difference between astaxanthin and placebo group lasted up to 48 hours after the administered exercise challenge.

### **SAFETY INFORMATION**

**Tolerability:** Astaxanthin is typically well tolerated. Minor GI discomfort and a reddish coloration of feces have been described during supplementation.

**Caution:** There is insufficient reliable information available about the safety of astaxanthin supplementation during pregnancy and breast-feeding; avoid using.

### **INTERACTIONS**

**Drug Interactions:** None known.

**Supplement Interactions:** Other carotenoids supplements (i.e., beta-carotene, lutein, lycopene) may decrease absorption of astaxanthin due to competition for absorption in the gastrointestinal tract.

**Interaction with Lab Tests:** None known.

### **STORAGE**

Store in a cool, dry place in original sealed container.