



AstaReal® Natural Astaxanthin

Astaxanthin - One of Nature's
Most Powerful Antioxidants

Muscle Performance

**Muscle Performance
Powered by AstaReal®
Astaxanthin**

Benefits of natural astaxanthin for muscles:

- Reduces excessive inflammation and muscle damage
- Improves muscle endurance and recovery
- Lowers lactic acid build up and fatigue
- Enhances fat metabolism by protecting muscle mitochondria from oxidation
- Decreases loss of muscle function in those affected by sarcopenia

Read more here www.astareal.se

What is natural astaxanthin?

Astaxanthin is a naturally occurring carotenoid derived from the microalgae *Haematococcus pluvialis*. It is one of the most powerful natural antioxidants known to science that exerts anti-inflammatory properties as well. Owing to its unique molecular structure, natural astaxanthin is able to span the entire lipid bilayer of the cell membrane and provide superior cell and mitochondrial protection from free radical damage.

Inflammation and muscle damage

Muscle cells are subject to breakdown and inflammation during and



after strenuous physical activity. Natural astaxanthin can counteract the excessive exercise-induced inflammatory processes and thus prevent injuries. Studies have shown significant results after a short-term supplementation.

A placebo-controlled, double-blind study with young football players showed that 4 mg of AstaReal® natural astaxanthin per day for 90 days significantly reduced markers for oxidative stress ⁽¹⁾. In similar study, astaxanthin improved the salivary IgA response and

prevented elevation of the inflammatory marker C-reactive protein (CRP) ⁽²⁾. The results indicate that natural astaxanthin supplementation combined with physical training attenuates muscle damage by scavenging of free radicals and blunting of the systemic inflammatory response.

As astaxanthin seems to protect muscle cells from damage, it may also assist in preventing muscle weakness during ageing. A formulation containing AstaReal® astaxanthin provided >50% increase in endurance and significantly decreased loss of muscle function in study participants affected by sarcopenia ⁽³⁾.



Endurance and fatigue

AstaReal® astaxanthin reduces lactic acid build-up, as shown in a study

undertaken among runners ⁽⁴⁾. By supporting aerobic respiration in the mitochondria, astaxanthin

can reduce blood lactate accumulation and enhance lactate clearance and so muscle endurance. Another study demonstrated that astaxanthin enhances lipid metabolism in muscles by protecting the mitochondrial proteins that are responsible for fatty acid regulation ⁽⁵⁾.

In addition, supplementing the diet with a natural nootropic like astaxanthin can help to support mental clarity and focus. AstaReal® astaxanthin has been shown to be simultaneously effective against both mental and physical fatigue ⁽⁶⁾.

Power and performance

Cyclists who took 4 mg natural AstaReal®

astaxanthin daily for 4 weeks increased their power output and cycling speed compared to those without supplementation ⁽⁷⁾. On average, their power output increased by 15%. In a similar study, daily supplementation of 12 mg astaxanthin increased the cycling speed and fat oxidation in males ⁽⁸⁾.

Another study examined the endurance, fitness and power of 40 healthy men in standard exercise tests ⁽⁹⁾. The astaxanthin group (4 mg natural AstaReal® astaxanthin daily for 6 months) were able to complete more squats compared to the placebo group, and improved their performance by 35% compared with the baseline.

References & selected publications

1. Djordjevic B, Baralic I, Kotur-Stevuljevic J, Stefanovic A, Ivanisevic J, Radivojevic N, et al. Effect of astaxanthin supplementation on muscle damage and oxidative stress markers in elite young soccer players. *J Sports Med Phys Fitness*. 2012 Aug;52(4):382–92.
2. Baralic I, Andjelkovic M, Djordjevic B, Dikic N, Radivojevic N, Suzin-Zivkovic V, et al. Effect of Astaxanthin Supplementation on Salivary IgA, Oxidative Stress, and Inflammation in Young Soccer Players. *Evid Based Complement Alternat Med*. 2015;2015:783761.
3. Liu SZ, Ali AS, Campbell MD, Kilroy K, Shankland EG, Roshanravan B, et al. Building strength, endurance, and mobility using an astaxanthin formulation with functional training in elderly. *J Cachexia Sarcopenia Muscle*. 2018 Oct;9(5):826–33.
4. Sawaki K, Yoshigi H, Aoki K, Koikawa N, Azumane A, Kaneko K, et al. Sports performance benefits from taking natural astaxanthin characterized by visual acuity and muscular fatigue improvement in humans. *J Clin Therap Medicine*. 2002;18(9):73–88.*
5. Aoi W, Naito Y, Takanami Y, Ishii T, Kawai Y, Akagiri S, et al. Astaxanthin improves muscle lipid metabolism in exercise via inhibitory effect of oxidative CPT I modification. *Biochem Biophys Res Commun*. 2008 Feb 22;366(4):892–7.
6. Hongo N, Fujishita M, Takihashi J, Tominaga K. Randomized controlled trial of the anti-fatigue effects of astaxanthin on mental and physical loads simulatin daily life. *J Clin Therap Medicine*. 2016;32(7):577–91.*
7. Earnest CP, Lupo M, White KM, Church TS. Effect of astaxanthin on cycling time trial performance. *Int J Sports Med*. 2011 Nov;32(11):882–8.
8. Brown DR, Warner AR, Deb SK, Gough LA, Sparks SA, McNaughton LR. The effect of astaxanthin supplementation on performance and fat oxidation during a 40 km cycling time trial. *J Sci Med Sport*. 2021 Jan;24(1):92–7.
9. Malmsten C, Lignell Å. Dietary Supplementation



with Astaxanthin-Rich Algal Meal Improves Strength Endurance – A Double Blind Placebo Controlled Study on Male Students. *Carotenoid Science*. 2008;13:20–9.

*References available upon request.



Tips for Formulating Sports Dietary Supplements with Natural Astaxanthin

Tips for Formulating Sports Dietary Supplements with Natural Astaxanthin

#1: Use innovative dosage forms

From capsules to liquid shots, to sachets, to soft gums, the possibilities for developing astaxanthin products for before, during or after workouts are almost unlimited. AstaReal's bulk product range includes different astaxanthin concentrations in the form of algal biomass, oil, microencapsulated and water-dispersible powder, thus allowing the development of innovative dosage forms.

#2: Choose the right dose

Low doses of astaxanthin are effective without affecting quality or benefits. Studies have shown significant results after supplementation in as little as 4 weeks, ensuring your customers will feel the benefits of astaxanthin working in your formula. Dosages in clinical research range from 4 to 16 mg astaxanthin with majority based on a

dose of 4 mg astaxanthin per day. Depending on where your products are sold, dosage recommendations and regulations may vary. To help determine which dose is right for your product, just contact us and we will be happy to offer advice.

#3: Combine it with other key ingredients

AstaReal® astaxanthin can be easily combined with a range of other ingredients. This potent natural antioxidant in combination with zinc provides extra muscle support, while together with collagen containing essential amino acids may offer synergistic effect on body composition and muscle strength. Other antioxidants, like ubiquinol and vitamins E and C, can help to protect the antioxidant capacity of astaxanthin. Lipids support astaxanthin



absorption. Mimicking its natural presence in krill oil, astaxanthin partners perfectly with omega-3 too, and may even enhance the health benefits of krill oil for muscle protein synthesis.

#4: Sustainability and traceability score high

Consumers are increasingly paying attention to the origin of the products they buy. Thus, demand for more naturally and sustainably sourced products will continue to rise. Consequently, the industry is looking for plant-based sources of traditional ingredients, such as antioxidants, and has already begun to focus on algae. Microalgae are the primary food source of basically all marine and freshwater food chains. The freshwater microalgae *Haematococcus pluvialis* represent a sustainable, plant-based alternative to astaxanthin and other healthful ingredients like omega-3s.

#5: Pay attention to quality and origin

Astaxanthin's quality is affected by the

environment in which the algae are cultivated. AstaReal rejected outdoor production methods as they are susceptible to contamination. Instead, we process our microalgae indoors under controlled

conditions. This results in a safe product with at least 5% astaxanthin in the biomass and without any environmental impurities.





Why AstaReal?



Trusted Science

AstaReal is an authority in human clinical studies and is the only brand of natural astaxanthin backed by over 70 clinical studies. With clinical studies across indications such as skin health, muscle performance, vision, cognitive function, heart health, immune function, and anti-fatigue, you can be assured that AstaReal® is supported by solid clinical evidence. Our global team of experts can also guide you in the proper usage of our clinical outcomes, dependent on the regulatory framework of your target market.



Unrivalled Quality Standards

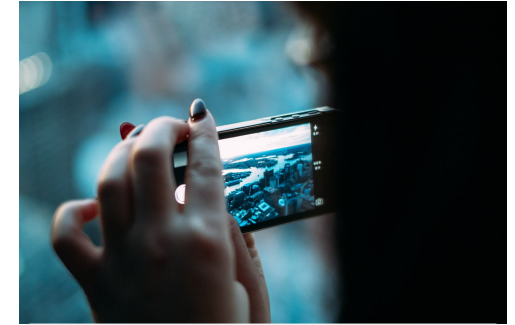
Stability and purity of natural astaxanthin matters as poor quality can have a negative impact on your final formula. Our cultivation process allows for optimal maturation of the algae cells, resulting in a superior astaxanthin product with the highest quality, stability, and concentration available on the market.

AstaReal® is ISO 9001, FSSC 22000, HACCP, Informed Ingredient, Halal and Kosher certified. Our Halal certification opens a range of opportunities for our partners. AstaReal® A1010, L10 and EL25 are registered by the Vegan Society.



Worldwide Expertise

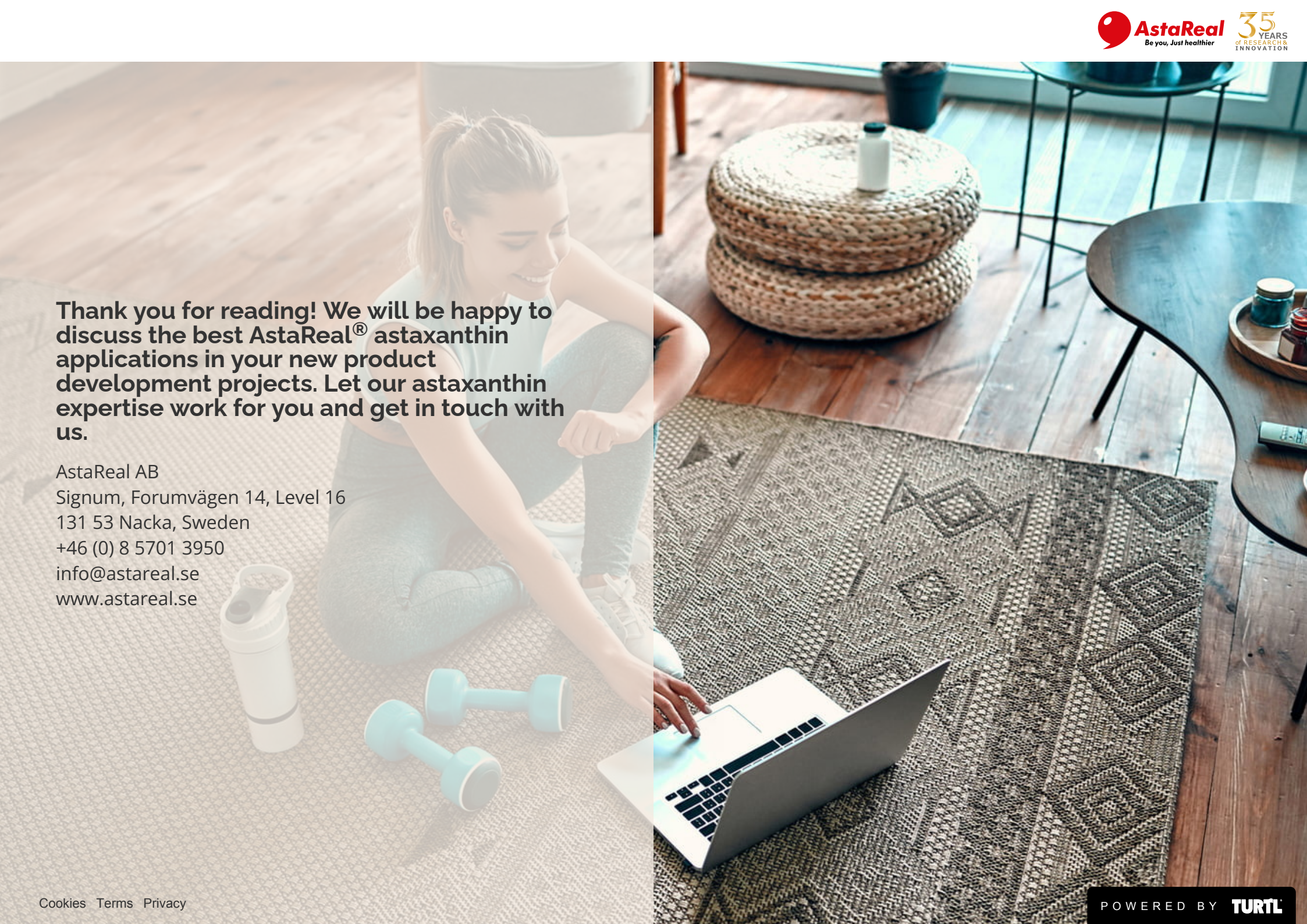
Take your product to the world – our partners benefit from access to talented, high performance local teams of technical, marketing, and regulatory experts with in-depth knowledge of the target regions.



Your Partner for Innovation

AstaReal® product range allows the development of innovative dosage forms, from traditional to on trend. Reach out to hear about the latest market insights that may inspire you in choosing the perfect delivery format for your target market.

Read more here
www.astareal.se



Thank you for reading! We will be happy to discuss the best AstaReal® astaxanthin applications in your new product development projects. Let our astaxanthin expertise work for you and get in touch with us.

AstaReal AB
Signum, Forumvägen 14, Level 16
131 53 Nacka, Sweden
+46 (0) 8 5701 3950
info@astareal.se
www.astareal.se