

AstaReal® Natural Astaxanthin

Astaxanthin - One of Nature's
Most Powerful Antioxidants

Natural Immune Defence





**Natural immune defence with AstaReal®
astaxanthin**

What is natural astaxanthin?

Astaxanthin is a naturally occurring carotenoid derived from the microalgae *Haematococcus pluvialis*. With its antioxidant, anti-inflammatory and immunomodulating properties, it has a potential ability to both balance and strengthen the immune system and thus improve the body's defence against external pathogens and chronic inflammation.

Healthy immune response

Our immune system is comprised of innate and adaptive immunity. Many of the phagocytes involved in the innate immune response generate reactive oxidative species (ROS) in order to defeat common invading bacteria, viruses and microbes. If cells are infected, T-lymphocytes from the adaptive immune system is recruited, which can activate B-lymphocytes to produce antibodies and a cellular memory of the invading microbe. Our immune system is complex and involves many different types of immune cells and production of both free radicals and pro-inflammatory cytokines.



The generation of ROS and free radicals are important to keep a well-functioning immune system, but excessive production can lead to oxidative stress and tissue damage. The

immune cells themselves are also sensitive to oxidative stress due to the high level of poly unsaturated fatty acids in their plasma membranes. To protect our cells and tissues a redox balance must be maintained. In order to achieve that we have an endogenous



production of antioxidants. Those contribute to the scavenging of free radicals, but dietary antioxidants are also needed to avoid oxidative stress. The most commonly used dietary antioxidants include vitamin C,

vitamin E, zinc, selenium, carotenoids and flavonoids. Astaxanthin belongs to the carotenoids and is a rising star among the available antioxidants.

With age, the activity of the cell-mediated immune response declines, with the most pronounced effect on the proliferation capacity of lymphocytes. Dietary supplementation of natural astaxanthin may enhance the immune response. In a randomized, double-blind study, both cell-mediated and humoral immune response were increased after 8 weeks of astaxanthin supplementation.¹ Increased T-lymphocyte count and increased proliferation of B-lymphocytes were observed in those receiving astaxanthin. Furthermore, oxidative DNA damage in blood cells decreased and the natural killer cells (NK-cells) activity increased after supplementation with astaxanthin. This suggests that astaxanthin can protect sensitive immune cells from oxidative damage and enhance the immune response through increased number of T-cells and higher activity of B-cells which can produce antibodies.

Astaxanthin may also be of value for athletes as physical activity induces oxidative stress, muscle injury and inflammation, and

decreases the immune response. A 90-day intervention study indicates that a daily dose of 4 mg of astaxanthin improves the production of salivary IgA antibodies and mitigate muscle damage in young soccer players.²

Balancing inflammation

Cytokines are important mediators of a normal immune system, both in the innate and adaptive system. These are pro-inflammatory signaling molecules that recruit additional immune cells to destroy microbes and infected cells. Different types of cytokines are needed to activate different types of immune cells. However, acute inflammation signaling should end once the infection has been cleared. In some cases, an immune response may persist, causing chronic inflammation that can attack healthy tissue. Astaxanthin has been shown to inhibit the production of cytokines and pro-inflammatory mediators such as nitric oxide and prostaglandin E2 both *in vitro* and *in vivo*, thus providing possible anti-inflammatory protection in the body.³ Recently, a small

clinical trial demonstrated favorable effects on gouty arthritis in patients after astaxanthin supplementation.⁴ Due to the anti-inflammatory properties, astaxanthin may be a good candidate substance for treatment of chronic inflammatory diseases.

The immune health market is changing

In the past, sales of immune health products tended to peak during the traditional cold and flu season. But due to the COVID-19 pandemic, the nutraceuticals industry has been seeing ongoing demand in this category, as consumers are constantly reflecting on their health. This presents an opportunity for manufacturers to stand out from the crowd with higher quality products offering special ingredients and innovative dosage forms. There is also an opportunity to tap into additional consumer demands, such as plant-based and more sustainable products. Astaxanthin has also been suggested as a complementary therapeutic agent against COVID-19 to manage the cytokine storm.⁵

Benefits of natural astaxanthin for immune health:

- Protects immune cells against oxidative stress
- Fights inflammation
- Strengthens and balances the immune system
- May enhance antibody production
- May accelerate immune response



References & Selected Publications

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5 Tips for formulating immune health supplements with natural astaxanthin

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#1: Use innovative dosage forms

Whether they are capsules, liquid shots, sachets or soft gums, the possibilities for developing astaxanthin products are almost unlimited. AstaReal's bulk product range includes different 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 short-term supplementation, 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 4-6 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 offers product developers a broad range of combination possibilities. This potent natural antioxidant can be easily combined with other immune-enhancing ingredients, such as vitamins D or C, selenium, zinc, pro- and prebiotics, botanical extracts such as elderberry, or ubiquinol, which plays a significant role in

cellular energy production.

#4: Sustainability and traceability score high

Consumers are increasingly paying attention to the origins 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 and is starting 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 it comes from is cultivated. AstaReal rejected outdoor production methods as they are susceptible to contamination. Instead, we process our algae indoors under controlled conditions. This results in a safe product with at least 5% astaxanthin content in the biomass and without any 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

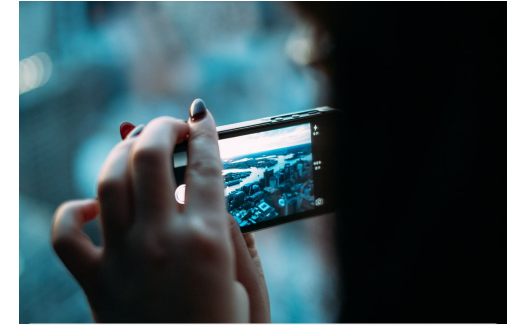
Stability and purity of natural astaxanthin matters as poor quality can have a negative impact on your final formula. Our cultivation process allows for optimal maturation of the cells, resulting in a superior product with the highest quality, stability and concentration available on the market.

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

The 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
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.

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