



Astaxanthin

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While some complementary and alternative techniques have been studied scientifically, high-quality data regarding safety, effectiveness, and mechanism of action are limited or controversial for most therapies. Whenever possible, it is recommended that practitioners be licensed by a recognized professional organization that adheres to clearly published standards. In addition, before starting a new technique or engaging a practitioner, it is recommended that patients speak with their primary healthcare provider(s). Potential benefits, risks (including financial costs), and alternatives should be carefully considered. The below monograph is designed to provide historical background and an overview of clinically-oriented research, and neither advocates for or against the use of a particular therapy.

Related Terms

- Alpha-carotene, Antarctic krill, AST, Astacarox®, astaxanthin-amino acid conjugate, astaxanthin diester, astaxanthin dilysinate tetrahydrochloride, ASX, Atlantic salmon, basidiomycete yeast, beta-carotene, BioAstin®, canthaxanthin, canthoxanthin, Cardax®, carotenoid, crayfish, crustaceans, DDA, disodium disuccinate astaxanthin, E161j, *Euphausia superba*, gamma-tocopherol, green microalgae, *Haematococcus* algae extract, *Haematococcus pluvialis*, krill, lutein, lycopene, meso-astaxanthin, microalgae, non-esterified astaxanthin, non-provitamin A carotenoid, ovoester, *Phaffia rhodozyma*, red carotenoid, retinoid, salmon, shrimp, sockeye salmon, tetrahydrochloride dilysine astaxanthin salt, tomato, trout, wild salmon, *Xanthophyllomyces dendrorhous*, xanthophylls.

Background

- Astaxanthin is classified as a xanthophyll, which is a carotenoid pigment, and can be found in microalgae, yeast, salmon, trout, krill, shrimp, crayfish, crustaceans, and the feathers of some birds. *Haematococcus pluvialis*, a green microalga and one of the richest sources of natural astaxanthin, was reviewed and cleared for marketing by the United States Food and Drug Administration (FDA) in August 1999 as a new dietary ingredient by means of the Dietary Supplement Health and Education Act (DSHEA) (21 CFR part 190.6).
- Astaxanthin is most commonly used as an antioxidant and may be beneficial in decreasing the risks of certain chronic diseases, such as cancer and cardiovascular diseases. Astaxanthin may also be effective in carpal tunnel syndrome, rheumatoid arthritis, muscle strength and endurance, high cholesterol (LDL oxidation), musculoskeletal injuries, and male infertility.
- Astaxanthin has been used as a feed supplement and food coloring additive for salmon, crabs, shrimp, chickens, and egg production. According to the Code of Federal Regulations, astaxanthin is generally recognized as safe (GRAS) when used as a color additive in salmon foods to obtain the desired pink to orange-red color.

Scientific Evidence

Uses

These uses have been tested in humans or animals. Safety and effectiveness have not always been proven. Some of these conditions are potentially serious, and should be evaluated by a qualified healthcare provider. **Grade***

Carpal tunnel syndrome

There is insufficient evidence to recommend for or against the use of astaxanthin for carpal tunnel syndrome. Additional study is needed in this area. **C**

High cholesterol (LDL oxidation)

There is insufficient evidence to recommend for or against the use of astaxanthin for LDL oxidation prevention. More research is needed to make a firm recommendation. **C**

Male infertility

There is insufficient evidence to recommend for or against the use of astaxanthin for male fertility. Additional study is needed in this area. **C**

Muscle strength

Astaxanthin may have positive effects on muscle strength. Better-quality trials are needed before a recommendation can be made. **C**

Musculoskeletal injuries

Astaxanthin does not appear effective for muscle injury prevention. Additional study is needed before a firm recommendation can be made. **C**

Rheumatoid arthritis

There is insufficient evidence to recommend for or against the use of astaxanthin for rheumatoid arthritis. More study is warranted in this area. **C**



Grading System

Tradition/Theory

The below uses are based on tradition, scientific theories, or limited research. They often have not been thoroughly tested in humans, and safety and effectiveness have not always been proven. Some of these conditions are potentially serious, and should be evaluated by a qualified healthcare provider. There may be other proposed uses that are not listed below.

- Antiandrogen (blocks male hormones), antibacterial, antihypertensive (lowers high blood pressure), anti-inflammatory, antimicrobial, antiviral, asthma, atherosclerosis (hardening of the arteries, prevention), autoimmune diseases, back pain (chronic), benign prostate hyperplasia, cancer, canker sores, cardiovascular disease (prevention and treatment), central nervous system disorders, dementia (vascular), diabetes, dyspepsia (upset stomach), exercise capacity improvement, eye problems, *Helicobacter pylori* infection, immune stimulant, neurodegenerative diseases (Parkinson's and Alzheimer's diseases), stroke, ultraviolet light skin damage protection, weight loss.

Dosing

The below doses are based on scientific research, publications, traditional use, or expert opinion. Many herbs and supplements have not been thoroughly tested, and safety and effectiveness may not be proven. Brands may be made differently, with variable ingredients, even within the same brand. The below doses may not apply to all products. You should read product labels, and discuss doses with a qualified healthcare provider before starting therapy.

Adults (18 years and older)

- In general, manufacturers have reported that 3 gencaps BioAstin® astaxanthin (6 milligrams) by mouth at each meal for eight weeks was safe in adults. Similarly, no toxicity or side effects were noted when taking up to 19.25 milligrams of AstaFactor® by mouth for 29 days.
- Doses typically range from 2-12 milligrams per day for two weeks to six months. BioAstin® has been used for carpal tunnel syndrome, rheumatoid arthritis, musculoskeletal injury, and sunburn.

For male infertility, 16 milligrams (AstaCarox®) by mouth daily for three months has been used. No dose has been proven safe or effective.

- Various seafoods contain the astaxanthin pigment. A standard serving portion of 4 ounces of Atlantic salmon contains from 0.5-1.1 milligrams of astaxanthin, whereas the same amount of sockeye salmon may contain 4.5 milligrams of astaxanthin.

Children (younger than 18 years)

- There is currently a lack of available scientific evidence to recommend the use of astaxanthin in children.

Safety

The U.S. Food and Drug Administration does not strictly regulate herbs and supplements. There is no guarantee of strength, purity or safety of products, and effects may vary. You should always read product labels. If you have a medical condition, or are taking other drugs, herbs, or supplements, you should speak with a qualified healthcare provider before starting a new therapy. Consult a healthcare provider immediately if you experience side effects.

Allergies

- Avoid in individuals with a known allergy or hypersensitivity to astaxanthin or related carotenoids, including canthaxanthin, or hypersensitivity to an astaxanthin algal source, such as *Haematococcus pluvialis*.

Side Effects and Warnings

- According to the Code of Federal Regulations, astaxanthin is generally recognized as safe (GRAS) when used as a color additive in salmon foods. Astaxanthin is likely safe when used as an antioxidant and as adjunctive support in cancer treatment, cardiovascular disease treatment and ocular (eye) health promotion.
- Side effects of astaxanthin use may include decreased blood pressure, increased skin pigmentation and hair growth, hormonal changes, lowered calcium levels in the blood, altered blood counts, decreased libido, and enlargement of the breasts (in men).
- Astaxanthin should be used cautiously in patients with hypertension (high blood pressure), asthma, parathyroid disorders, or osteoporosis. Avoid use in patients with known allergies to astaxanthin, hormone-sensitive conditions or immune disorders.

Pregnancy and Breastfeeding

- Astaxanthin is not recommended for use during pregnancy or breastfeeding. Astaxanthin may be unsafe in pregnant women, as it may affect reproductive hormones.
- Astaxanthin has been studied as an agent to treat male infertility, although results were inconclusive.

Interactions

Most herbs and supplements have not been thoroughly tested for interactions with other herbs, supplements, drugs, or foods. The interactions listed below are based on reports in scientific publications, laboratory experiments, or traditional use. You should always read product labels. If you have a medical condition, or are taking other drugs, herbs, or supplements, you should speak with a qualified healthcare provider before starting a new therapy.

Interactions with Drugs

- Astaxanthin may decrease blood pressure. Patients currently taking blood pressure lowering medications should consult with a qualified healthcare professional, including a pharmacist.
- Astaxanthin may have similar effects as the antihistamines etirizine dihydrochloride and azelastine. Caution is advised when using asthma medications.
- Astaxanthin may interfere with the way the body processes certain drugs using the liver's "cytochrome P450" enzyme system. As a result, the levels of other drugs may become too high in the blood. It may also alter the effects that other drugs possibly have on the P450 system.
- Astaxanthin may inhibit *Helicobacter pylori* growth and have an additive effect when taken with other medications that have a similar effect.
- Astaxanthin may have hormonal effects and may interact with other hormone-altering medications, such as medications taken for menopause or birth control pills. It may also interact with immunomodulating medications.
- Astaxanthin may lower calcium levels in the blood. In theory, it may interact with parathyroid medications and caution is advised.
- Astaxanthin may decrease low density lipoprotein (LDL) oxidation and may interact with other cholesterol-lowering medications, such as atorvastatin (Lipitor®, taken off the U.S. market). Patients taking any medications should consult with a qualified healthcare professional, including a pharmacist.

Interactions with Herbs and Dietary Supplements

- Astaxanthin may have hormonal effects and may interact with other hormone-altering herbs and supplements, such as saw palmetto or black cohosh.
- Astaxanthin may decrease blood pressure. Patients currently taking blood pressure lowering herbs and supplements should consult with a qualified healthcare professional, including a pharmacist.
- Astaxanthin may lower calcium levels in the blood. In theory, it may interact with herbs and supplements that alter parathyroid function and caution is advised.
- Concomitant use of astaxanthin with other carotenoids (beta-carotene, lutein, canthaxanthin, and lycopene) may decrease the absorption of astaxanthin, due to competitive absorption in the gastrointestinal tract. Caution is advised.
- Astaxanthin may interfere with the way the body processes certain herbs or supplements using the liver's "cytochrome P450" enzyme system. As a result, the levels of other herbs or supplements may become too high in the blood. It may also alter the effects that other herbs or supplements possibly have on the P450 system.
- Astaxanthin may inhibit *Helicobacter pylori* growth and have an additive effect when taken with other herbs and supplements that have a similar effect. It may also interact with immunomodulating herbs and supplements.
- Astaxanthin may decrease low density lipoprotein (LDL) oxidation and may interact with other cholesterol-lowering herbs and supplements, such as red yeast rice. Caution is advised.

Author Information

- This information is based on a systematic review of scientific literature edited and peer-reviewed by contributors to the Natural Standard Research Collaboration (www.naturalstandard.com).

References

Natural Standard developed the above evidence-based information based on a thorough systematic review of the available scientific articles. For comprehensive information about alternative and

complementary therapies on the professional level, go to www.naturalstandard.com. Selected references are listed below.

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