NutraMedix

Antarctic Krill

Applications

- Cardiovascular Support
- Skin Support
- Joint/Muscle Support
- Brain Support
- Ocular Support

Introduction

NutraMedix Antarctic Krill Oil is sustainably harvested from **Antarctic krill** (*Euphausia superba*). Krill are small shrimp-like crustaceans in the Euphausiidae family, harvested from the pristine Southern Ocean surrounding Antarctica. Antarctic krill are at the bottom of the food chain, feeding primarily on phytoplankton. This allows them to provide nutrients such as omega-3s to other marine animals for which they are a primary food source, making them a keystone species. Antarctic krill are one of the most abundant species in the world, having an estimated biomass greater than the global population of humans.[1]

Antarctic krill oil contains long-chain omega-3 fatty acids (EPA and DHA), phospholipids, choline, and astaxanthin. Omega-3s, designated essential as the body needs but cannot synthesize them, include alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA).[2] Plant sources of omega-3s contain only ALA and include flaxseed, chia seed, walnuts, and canola oil.[2] While the body can convert ALA to DHA and EPA, conversion is inefficient and the direct consumption of DHA and EPA is preferred.[2,3] In a randomized, controlled trial with healthy individuals, increased intake of DHA and EPA supported a healthy omega-3 Index (O3-I) while increased intake of ALA did not.*[4] Dietary sources of the preferred EPA and DHA include cold-water fatty fish such as salmon, herring, sardines, mackerel and tuna.[2]

Choline is used to synthesize phospholipids for cell membranes and to produce the neurotransmitter acetylcholine.*[5] Choline is produced in limited amounts in the liver,[6] and can be found in foods such as beef liver, egg, soybeans and fish.[5] Astaxanthin, a xanthophyll carotenoid with antioxidant activity, can be found in tomatoes, red grapefruit, and red watermelon.*[7,8] The astaxanthin in krill oil comes from their diet of phytoplankton, and is a natural-source antioxidant that helps stabilize the omega-3 fatty acids.*

The primary difference between krill oil and fish oil is that krill oil contains omega-3s in phospholipid form while fish oil contains omega-3s in triglyceride form. Krill oil, additionally, contains choline and astaxanthin. EPA and DHA in phospholipid form may be more bioavailable than in triglyceride form, due to an increased affinity with the phospholipid bilayer.*[9,10] Krill oil with a higher phospholipid content was found to be more bioavailable than krill oil with a lower phospholipid content.*[11] Krill oil may also be more effective than fish oil in maintaining the omega-3 index (O3-I) already within the normal range.*[12]

NutraMedix Antarctic Krill Oil is 100% traceable from sea to shelf, with each batch labeled with coordinates of origin. It is also certified sustainable by the Marine Stewardship Council (MSC). Starting at the moment of harvest, patented Flexitech™ and Eco-Harvesting® technology eliminates by-catch, reduces environmental impact, and removes unwanted salts and other

polar constituents, further concentrating the beneficial components. NutraMedix rigorously follows current good manufacturing practices (cGMP), as do our suppliers, and our products undergo stringent ID testing, microbial testing, and heavy metal testing. Antarctic Krill Oil has been extensively tested and found to be free of contaminants such as dioxins, dioxin-like PCBs (polychlorinated biphenyls), furans, organochlorine pesticides, polybrominated diphenyl ethers (PDBEs), polycyclic aromatic hydrocarbons (PAHs), fluoride, arsenic, trans fatty acids, marine algal toxins, and heavy metals.[13]

Cardiovascular Support

Antarctic krill oil may help with cardiovascular support.*[14] While it is widely accepted that optimal omega-3 levels help support cardiovascular health, levels are often suboptimal.* In a cross-sectional study with 200 U.S. and German adult participants ages 18–80, only four of the German participants and none of the U.S. participants had omega-3 index (O3-I) blood values within the optimal range.[15] The O3-I is the percent of erythrocyte fatty acids that are DHA and EPA, and is a predictor of cardiovascular health.*[15,16] An O3-I ≥8 is most cardioprotective while an O3-I ≤4% is least cardioprotective.*[17]

Krill oil may help maintain blood C-peptide levels, HDL levels, and HOMA scores already within the normal range.*[18] It may also help maintain CRP levels, apolipoprotein A1 levels,[19] triglyceride levels,[20] VLDL levels, and chylomicron levels already within the normal range.*[21] In a systematic review and meta-analysis of seven randomized, controlled trials with a total of 662 participants, researchers concluded that krill oil helped maintain LDL, HDL, and triglyceride levels already within the normal range.*[22]

Skin Support

Antarctic krill oil may help maintain uniform skin pigmentation.*[23] Oral consumption of EPA, such as found in krill oil, may help maintain dermal EPA and arachidonic acid levels already within the normal range, which may support healthy photoprotection.*[24] In combination with other ingredients in an oral superoxide dismutase-containing formula, EPA helped support normal photoprotection and healthy skin elasticity.*[25]

Other Support

Joint/Muscle Support

Antarctic krill oil may help maintain healthy joints, supporting CRP levels and WOMAC scores already within the normal range.*[26] It may support knee comfort during standing or sleep and help maintain a normal range of motion (ROM).*[27]

Brain Support

Antarctic krill oil may help with neurological support.* In a double-blind, controlled parallel trial with healthy male volunteers ages 61–72, participants were randomly assigned to krill oil, sardine oil, or medium-chain triglycerides. The effects of krill oil (omega-3s in phospholipids) were compared to the effects of sardine oil (omega-3s in triglycerides) and to the effects of medium-chain triglycerides (placebo). Compared to the placebo, both krill oil and sardine oil supported normal oxyhemoglobin levels in the cerebral cortex during memory and calculation tasks, and krill oil was the most effective at maintaining healthy cognitive function.*[28] Krill oil may also support normal processing speed.*[29]

Ocular Support

Antarctic krill oil may help with ocular support.*[30] While both fish oil and krill oil may help maintain healthy tear osmolarity, krill oil is superior at maintaining a healthy OSDI score already within the normal range.*[30]

Safety & Cautions

Antarctic krill oil is generally well tolerated and has been used safely in doses up to 4 grams daily for as long as 3 months.[31] There is insufficient data available on safety in pregnancy and breastfeeding.[31] Side effects may include gastrointestinal symptoms such as upset stomach, nausea, heartburn, decreased appetite, bloating, flatulence or diarrhea, though less frequently than with fish oil.[31]

Antarctic krill oil may theoretically increase the risk of hypoglycemia when taken with hypoglycemic drugs.[31] It may also, theoretically, increase the risk of bleeding if used concurrently with anticoagulant or antiplatelet drugs.[31] Krill oil should be discontinued at least two weeks before elective surgery.[31] Those allergic to seafood may also be allergic to krill oil, though the likelihood

of this is currently unknown.[31] Krill oil should be avoided, or used with caution, in those with seafood allergy.[31]

Safety is not documented in breastfeeding or pregnant women, or in children under age 3, due to insufficient safety research.

*This statement has not been evaluated by the Food and Drug Administration. This product is not intended to treat, cure, or prevent any diseases.

References

[1]CCAMLR. (2021). Krill fisheries and sustainability | CCAMLR. Ccamlr.org. Retrieved 11 August 2021, from https://www.ccamlr.org/en/fisheries/krill-fisheries-and-sustainability.
[2]ODS. (2021). Office of Dietary Supplements - Omega-3 Fatty Acids. Ods.od.nih.gov. Retrieved 11 August 2021, from https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/.
[3]LPI. (2021). Essential Fatty Acids. Linus Pauling Institute. Retrieved 11 August 2021, from https://lpi.oregonstate.edu/mic/other-nutrients/essential-fatty-acids.
[4]Köhler, A., Heinrich, J., et al. (2017). Nutrients, 9(6), 629.
[5]ODS. (2021). Office of Dietary Supplements - Choline. Ods.od.nih.gov. Retrieved 11 August 2021, from https://ods.od.nih.gov/factsheets/Choline-HealthProfessional/.
[6]Ross, A.C., Caballero, B., et al. (2014). Modern Nutrition in Health and Disease (11th ed., pp. 416-26). Wolters Kluwer|Lippincott Williams & Wilkins.
[7]Ambati, R.R., Phang, S.M., et al. (2014). Marine Drugs, 12(1), 128-152.
[8]LPI. (2021). Inflammation. Linus Pauling Institute. Retrieved 11 August 2021, from https://lpi.oregonstate.edu/mic/health-disease/inflammation.
[9]Ulven, S.M., & Holven, K.B. (2015). Vascular Health and Risk Management, 11, 511-524.
[10]Schuchardt, J.P., Schneider, I., et al. (2011). Lipids in Health and Disease, 10, 145.
[11]Ramprasath, V.R., Eyal, I., et al. (2015). Lipids in Health and Disease, 14, 142.
[12]Ramprasath, V.R., Eyal, I., et al. (2013). Lipids in Health and Disease, 12, 178.
[13]Burri, L. (2018). Krill oil concentrate: The phospholipid factor that sets krill oil apart [Ebook]. Aker BioMarine.
[14]Rundblad, A., et al. (2018). Journal of Nutritional Science, 7(e3), 1-11.
[15]Thuppal, S.V., von Schacky, C., et al. (2017). Nutrients, 9(9), 930.
[16]von Schacky C. (2014). Nutrients, 6(2), 799-814.
[17]Harris, W.S. & von Schacky, C. (2004). Preventive Medicine, 39(1), 212-220.
[18]Lobraico, J.M., DiLello, L.C., et al. (2015). BMJ Open Diabetes Research & Care, 3(1), e000107.
[19]Cicero, A.F., Rosticci, M., et al. (2016). Archives of Medical Science, 12(3), 507-512.
[20]Berge, K., Musa-Veloso, K., et al. (2014). Nutrition Research, 34(2), 126-133.
[21]Berge, R.K., Ramsvik, M.S., et al. (2015). Lipids in Health and Disease, 14, 163.
[22]Ursoniu, S., Sahebkar, A., et al. (2017). Nutrition Reviews, 75(5), 361-373.
[23]Kocakoglu, S., & Akpinar, E. (2020). Journal of Medical-Clinical Research & Reviews, 4(1), 1-3.
[24]Pilkington, S.M., Rhodes, L.E., et al. (2014). Molecular Nutrition & Food Research, 58(3), 580-590.
[25]Goldberg, L.D., & Crysler, C. (2014). Clinical, Cosmetic and Investigational Dermatology, 7, 139-144.
[26]Deutsch L. (2007). Journal of the American College of Nutrition, 26(1), 39-48.
[27]Suzuki, Y., Fukushima, M., et al. (2016). PloS One, 11(10), e0162769.
[28]Konagai, C., Yanagimoto, K., et al. (2013). Clinical Interventions in Aging, 8, 1247-1257.
[29]van der Wurff, I.S., von Schacky, C., et al. (2016). Nutrients, 8(1), 13.
[30]Deinema, L.A., Vingrys, A.J., et al. (2017). Ophthalmology, 124(1), 43-52.
[31]Natural Medicines. (2021). Krill Oil [monograph]. http://naturalmedicines.therapeuticresearch.com

PROFESSIONAL USE ONLY