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Protective Antioxidants in Seafood: Supporting Health and Combating Disease

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INTRODUCTION

Oxidative Stress

Imbalance between free radicals and antioxidants in the body. Associated with DNA damage, inflammation, metabolic disease and other health issues.

Role of Antioxidants

Molecules that neutralize free radicals, preventing cellular damage. The body possesses an endogenous antioxidant system, however, this can be enhanced using external sources antioxidants.

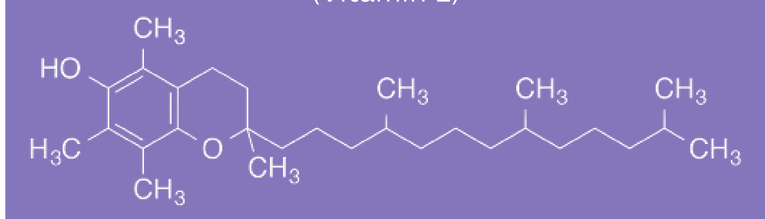
Seafood-Derived Antioxidants

Seafood is a rich source of various antioxidants

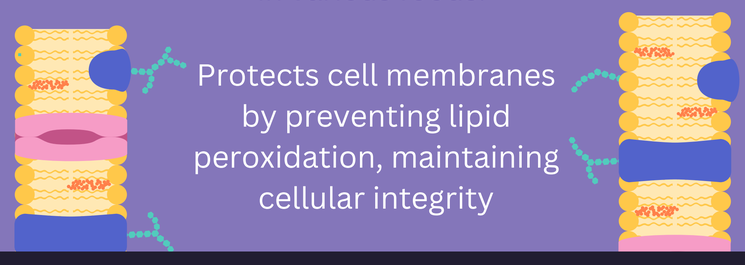
- Astaxanthin
- Tocopherols
- Selenium
- Coenzyme Q10
- Omega-3s
- ...

TOCOPHEROLS

(Vitamin E)



Essential lipid-soluble antioxidant present in various foods.

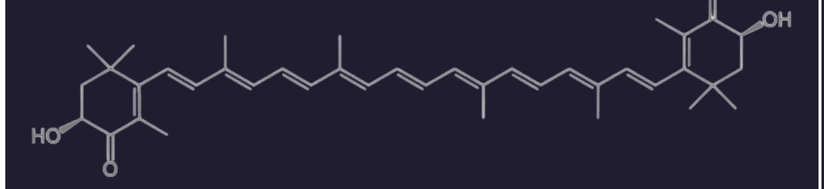


Protects cell membranes by preventing lipid peroxidation, maintaining cellular integrity

Astaxanthin is responsible for the pink color in trout and salmon

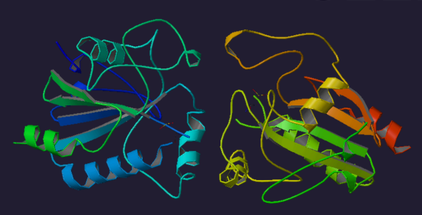
ASTAXANTHIN

100-500x
Higher antioxidant capacity than α-tocopherol



High capacity to donate electrons, thereby preventing radical induced damage

SELENIUM



Selenoprotein - Glutathione Peroxidase (GPx)

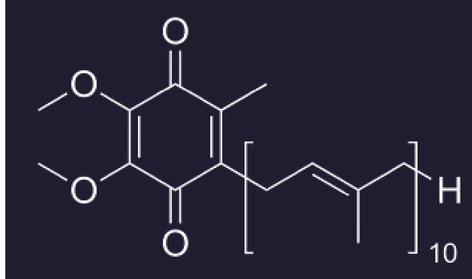
Essential component of selenoproteins, which have critical antioxidant functions, including the reduction of hydrogen peroxide and lipid hydroperoxides

34
Se
Selenium
78.96

1 serving of Yellowfin Tuna	183.9 µg of Se	334% of DV
1 serving of Pacific Oysters	130.9 µg of Se	238% of DV
1 serving of Atlantic Salmon	79.6 **µg of Se**	145% of DV

Sardines contain approximately 5 to 64 milligrams of CoQ10 per kilogram of fresh weight. It's important to note that cooking methods can influence CoQ10 content. Frying, for instance, may reduce CoQ10 levels by 14–32%.

COENZYME Q10



Plays a vital role in mitochondria by facilitating electron transport in the respiratory chain (ATP production).

Supplementation

- Reduced risk of neurodegenerative diseases
- Improve heart health
- Enhance energy production

OMEGA-3 FATTY ACKIDS

1 serving of Salmon (85 g)	1.1-1.9 g of EPA and DHA
1 serving of Mackerel (85 g)	1.1-1.7 g of EPA and DHA
1 serving of Sardines (100 g)	0.98 g of EPA and DHA
1 serving of Herring (85 g)	1.71 g of EPA and DHA

Reccomended amount

250–500 mg/day of combined EPA and DHA is considered sufficient for general health for healthy adults (WHO).

Studies suggest that EPA and DHA may improve inflammation, cardiovascular health, depression, mitochondrial function, and cancer outcomes, with DHA often showing broader effects on inflammation and blood lipids, while EPA may be more effective in depression treatment and reducing oxidative stress.

CONCLUSION

Seafood is a rich and natural source of powerful antioxidants, including astaxanthin, tocopherols, selenium, coenzyme Q10, and omega-3 fatty acids (EPA and DHA). These compounds collectively play a critical role in mitigating oxidative stress, reducing inflammation, and promoting overall health. Incorporating a variety of seafood into the diet not only provides these essential nutrients but also supports a balanced and healthy lifestyle. By emphasizing the health benefits of seafood-derived antioxidants, this review highlights their potential in reducing the risk of chronic diseases such as cardiovascular disorders, cancer, and neurodegenerative conditions. The findings underscore the importance of seafood as a functional food, offering both nutritional and therapeutic benefits.

ACKNOWLEDGEMENTS

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