



Issue 46: June 2024: This e-bulletin is aimed at personnel in fisheries and aquaculture, at fish packers, processors, distributors, retailers and finally, consumers.

Omega-3s update:-many positives!

SeaHealth-ucd Issues 16, 24, 27, 31 and 39 outlined the health benefits of omega-3 polyunsaturated fatty acids (omega-3 PUFAs) in the diet and advised a daily intake of 1g of EPA (eicosapentaenoic acid)/DHA (docosahexaenoic acid). A normal sized portion of oily fish readily delivers this amount. The omega-3 area continues to 'explode' with new benefits being realised on a frequent basis. Exploring new sustainable sources of EPA/DHA is a major priority.

Omega-3 status vs risk of long term cardiac events

Higher omega-3 PUFA status has been linked to reduced risk of long-term cardiac events in the OMEGA-REMODEL randomized clinical trial (Bernhard *et al.*, 2024). The aim was to study the impact of omega-3 PUFAs on adverse cardiac events in long-term follow up post-myocardial infarction in a pilot trial. Results suggest that while omega-3 PUFAs reduce inflammation and adverse cardiac remodelling after acute myocardial infarction, the impact of omega-3 PUFAs on long-term clinical outcomes remains uncertain.

Effect of omega-3 supplementation on aggression

There is increasing interest in the use of omega-3 supplements to reduce aggression and antisocial behaviour both in children and adults. A meta-analysis involving 29 randomized controlled trials (3918 participants) on omega-3 supplementation and aggressive behaviour yielded positive results (Raine & Brodrick, 2024). The findings showed that omega-3 supplementation at circa 2g/day significantly reduced aggressive behaviour in the short-term at a modest level and the effect applied across age and gender in different populations. Given the economic and psychological cost of aggression and violence in society, even small effects are important. The authors conclude that omega-3 supplementation should be considered as an adjunct to other interventions in the treatment of aggressive behaviour.

Omega-3s and brain function

DiNicolantonio & O'Keefe (2020) stress the importance of DHA for development of the central nervous system, e.g. brain and eye. In humans, the accumulation of DHA occurs mostly during the last trimester of pregnancy as well as the first 6–10 months after birth. Average PUFA values for breast milk are: DHA (0.3–0.6%), arachidonic acid (0.4–0.7%), linoleic acid (LA) (8–17%), and alpha-

linolenic acid (ALA) (0.5–1%) (Barcelo-Coblijn & Murphy, 2009). However, optimal breast milk DHA values are around 0.8% of total fatty acids. Children born prematurely miss peak DHA accumulation from the mother and some infant formulas may only provide LA and ALA. DHA deficiency is associated with numerous adverse health outcomes, e.g. impaired cognition and visual function, decreased learning ability and altered behaviour.

Availability of EPA & DHA

The global omega-3 market is valued at \$2.62 billion and is a fast-growing element of the dietary supplement sector. Increasing consumer awareness of omega-3s for heart health is driving demand, and increased price, as are the requirements for inclusion in the feed of farmed salmon (Anon., 2024). This demand is pressurising fish oil supplies even though Antarctic krill biomass (a major source) was estimated at 400–1550 million tonnes in 1990 (Suzuki & Shibata, 1990). The Norwegian Institute of Marine Research Scotia Sea survey (2011–2020) showed average krill biomass within the 60,000km² survey area of 1.4–7.8 million tonnes (Skaret et al., 2023). The Scotia Sea is located at the northern edge of the Southern Ocean at its boundary with the South Atlantic Ocean. Antarctic krill are rich in EPA, DHA, phospholipids and astaxanthin and are a precious resource that must not be overfished as they are a major food source for marine animals and humans. Algae also have potential as sources of omega-3 PUFAs as outlined in SeaHealth-ucd Issue 45. The Global Organization for EPA and DHA omega-3s (GOED) represents the worldwide EPA and DHA omega-3 industry. Membership is built on a quality standard unparalleled in the market. The GOED mission is to increase consumption of EPA/DHA regardless of the source, and ensure that members produce quality products that consumers can trust.

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The previous 45 issues of SeaHealth-ucd can be viewed at:
<https://www.ucd.ie/foodandhealth/eventsandoutreach/seahealthucd/>

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