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Editorial: Optimal omegas

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Editorial on the Research Topic
Optimal omegas

The Frontiers "*Optimal omegas*" Research Topic was assembled to provide a scientific update on field human health studies, the modulation of metabolic pathways, traditional and novel dietary sources of omega-3 fatty acids, sustainable production of foods providing omega-3 fatty acids and bioavailability studies.

Trends toward sustainable plant-based diets mean that modern dietary staples are shifting with momentum, leading to ramifications for intakes of omega-3 fatty acids and the essential fatty acid metabolic pathway. Subsequently, there are growing demands for sustainable food-derived sources of omega-3 (ω-3) fatty acids.

Two publications in the Research Topic used National Health and Nutrition Examination Survey (NHANES) data. Li Y. et al. identified that omega-3 and omega-6 polyunsaturated fatty acids were negatively associated with neutrophil-lymphocyte ratio, white blood cell counts, systemic immune-inflammation index and platelet-lymphocyte ratio. Interestingly, Yan et al. found that omega-3 intakes exceeding 2.05 g and ω-6 intakes ranging from more than 11.42 g to ≤to 19.16 g lowered frailty risk amongst middle-aged and elderly individuals.

An updated systematic review of randomized controlled trials found that eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) both lower triglyceride levels, with docosahexaenoic acid having a greater effect (Choi and Calder). Li K. et al. found that mussel oil was more potent than fish oil in preventing atherosclerosis, with the downregulation of p38MAPK/NF-κB signaling pathway being one plausible mechanism. Derbyshire et al. discussed potential ways forward focusing on innovative delivery methods to utilize omega-3 long-chain polyunsaturated fatty acid rich oils including the use of fortification strategies, bioengineered plants, microencapsulation, and microalgae.

A pilot study in patients with the homozygous ancestral (minor) FADS1 genotype demonstrated that FADS1 genotypes significantly decreased blood levels of ω-6 polyunsaturated fatty acids (PUFAs), particularly arachidonic acid (AA) without having a notable impact on the ω-3 PUFAs such as EPA and DHA, liver fat content and AA-derived lipid mediators (Rabehl et al.).

Macura et al. found the resilience of DHA homeostasis in the retina and retinal pigmented epithelium (RPE) of 2-month-old mouse offspring, even following high-dose fish oil supplementation during pregnancy and lactation. Another significant finding in this study was an upregulation of major facilitator superfamily domain-containing protein (Mfsd2a), a key DHA transporter and transcytosis regulator during development. The post-market cohort study showed that AlmegaPL®, an EPA-only polar lipid supplement derived from the microalga Nannochloropsis, effectively reduced triglycerides (TG) and remnant cholesterol (RC) in a real-world consumer setting (Ganuza et al.).

A clinical trial conducted by Rafieipoor et al. revealed that ω-3 supplementation (3 g/day for 2 months) did not have a significant effect on managing chronic kidney disease-associated pruritus (CKD-aP) in patients undergoing hemodialysis.

Overall, these articles have provided some valuable field insights within the omega scientific field. In particular, non-animal derived sources of omegas is an exciting area to monitor for the future and one for which ongoing research is highly valuable.

Author contributions

ED: Writing – original draft, Writing – review & editing. KL: Writing – original draft, Writing – review & editing. ID: Writing – original draft, Writing – review & editing.

Conflict of interest

ED was employed by Nutritional Insight Limited.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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