Algal-oil supplements are a viable alternative to fish-oil supplements in terms of docosahexaenoic acid (22:6n-3; DHA)

Article *in* Proceedings of The Nutrition Society · January 2013

DOI: 10.1017/S0029665113001079

3 authors, including:

Lisa Ryan
Galway-Mayo Institute of Technology

Amy Symington
George Brown College

Proceedings of the Nutrition Society (2013), **72 (OCE2)**, E96 doi:10.1017/S0029665113001079

Scottish Section Meeting, 18–19 March 2013, Polyunsaturated fatty acid mediators: implications for human health

Algal-oil supplements are a viable alternative to fish-oil supplements in terms of docosahexaenoic acid (22:6*n*-3; DHA)

L. Ryan, A. Fraser and A. Symington
Functional Food Centre, Oxford Brookes University, Gipsy Lane, Oxford, OX3 0BP

The market for and use of docosahexaenoic acid (DHA) sourced from algae, although still relatively novel, is steadily increasing worldwide. However, whether or not it is as efficient in supplying the omega-3 fatty acid as DHA sourced from fish is an area of research that has not been fully explored. DHA derived from algal-oil capsules was compared to DHA derived from fish-oil capsules in relation to bioequivalence. In an open-label randomized pilot study we recruited 31 healthy men and women aged 22–60 to take 600 mg DHA/d sourced from either algal-oil capsules or fish-oil capsules for a period of 2 weeks. The groups were divided into 3 categories for analysis: omnivore fish-oil (OF) ($n = 10$), omnivore algal-oil (OA) ($n = 9$), and vegetarian/vegan algal-oil (V) ($n = 12$). Plasma DHA levels were expressed as % of total fatty acids. The change in % DHA levels, from baseline to follow-up, was analysed from plasma phospholipid samples obtained from each participant. DHA levels were compared using a post hoc Tukey test and independent *t* tests were run to determine bioequivalence between groups OF and OA.

After the 2-week supplementation period, the % DHA levels increased significantly ($P<0.05$) in all groups. In terms of bioequivalence, when adjusted for weight, the % change in DHA between groups OF and OA was found to be significantly ($P<0.05$) different. The levels of DHA in group OA increased by a significant ($P<0.05$) amount in comparison to group OF. In addition, when comparing all 3 groups, there was no significant ($P>0.05$) difference in the final % DHA levels, which were found to be similar between groups. The baseline % DHA levels of the V group was significantly ($P<0.05$) lower than the omnivore group at baseline yet achieved similar DHA levels after a 2-week supplementation period.

In conclusion, these results indicate that algal-oil supplements are a sufficient and viable source of DHA for both fish and non-fish eaters alike. Although the supplements were not found to be bioequivalent, the algal-oil capsules significantly surpassed the fish-oil capsules in the % change of DHA over the 2 week supplementation period. In addition, the findings also indicate vegetarians' and vegans' ability to reach levels of DHA that are significantly comparable to healthy omnivores in a short period of time.