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Dietary supplementation with n-3 fatty acids (n-3 FA) for 4 weeks reduces post-exercise fatigue and delayed onset muscle soreness (DOMS) in trained male athletes

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High intensity exercise in the form of eccentric contractions can lead to the formation of free radicals, stimulating an inflammatory response^(1,2). Consumption of n-3 FA may help modify inflammation and immune reactions beneficial to health by decreasing interleukin-6, tumour necrosis factor-alpha and C-reactive protein⁽³⁾. For trained athletes to improve athletic performance, recovery from training is important and DOMS is frequently experienced following eccentric exercise, impacting negatively on strength⁽⁴⁾. The Western diet is however, characterised by a high n-6 FA consumption relative to n-3 FA, formulating ratios often in excess of 16:1⁽⁵⁾. The use of non-steroidal anti-inflammatory drugs in the form of n-3 FA has been investigated by a number of clinical trials in untrained athletes, but whether this can be translated into attenuating exercise induced inflammation in trained athletes is still under investigation.

A double-blind, randomised controlled trial was conducted in 22 trained male athletes who supplemented their diet with either 3000 mg/d of fish oil (gel capsules) consisting of 990 mg eicosapentaenoic acid (EPA) and 660 mg docosahexaenoic acid (DHA) ($n = 11$), or 3000 mg/d olive oil placebo ($n = 11$), for 28d. Participants underwent 3 sets of eccentric bicep curls in their dominant arm until failure and arm circumference, number of repetitions completed and DOMS/fatigue scores via visual analogue scale (VAS) were recorded at 0, 24 and 48 h after exercise, pre and post supplementation.

No group performed better during the eccentric bicep test, pre and post supplementation, and at baseline, no differences were observed between groups for DOMS and fatigue. However, post supplementation, DOMS was significantly lower at 24 h ($P = 0.005$) and 48 h ($P = 0.002$) and fatigue was significantly lower at 24 h ($P = 0.043$) and 48 h post exercise ($P < 0.001$) in the n-3 FA group compared to the placebo group (Fig. 1). These findings indicate that n-3 FA supplementation has the potential to promote recovery and subsequently increase athletic performance in trained male athletes and may be a useful ergogenic aid. Possible anti-inflammatory mechanisms of n-3 FA should be further investigated using specific biomarkers of inflammation.

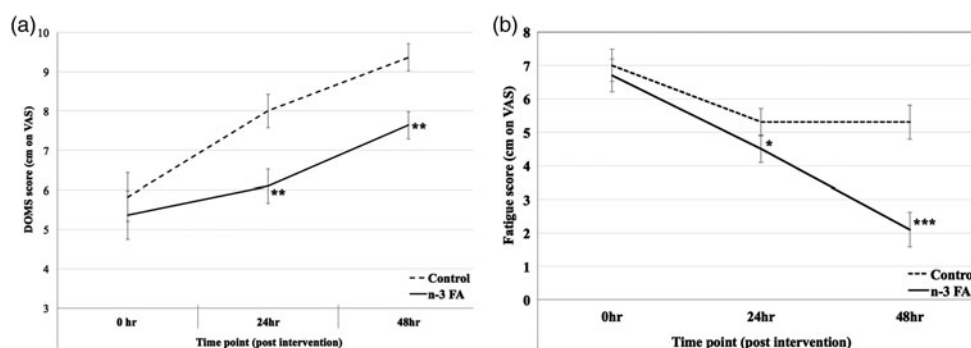


Figure 1. DOMS (a) and fatigue (b) scores (cm on VAS scale) in response to eccentric bicep curls in trained male athletes following 4 weeks supplementation with 3000 mg/d n-3 FA ($n = 11$) and placebo ($n = 11$). Asterisks indicate a significant difference in scores between groups at equivalent time points (* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$).

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