

Concurrent Session 8

Effects of omega-3 polyunsaturated fatty acids on cardiovascular risk, exercise performance and recovery in Australian Football League (AFL) players

JD Buckley^{1,2}, S Burgess², KJ Murphy², PRC Howe^{1,2}

¹ATN Centre for Metabolic Fitness, School of Health Sciences, University of South Australia

²Nutritional Physiology Research Centre, University of South Australia and University of Adelaide

Background - Long chain omega-3 polyunsaturated fatty acids (LCn-3) can improve cardiovascular (CV) function and reduce the risk of CV disease. Studies have investigated the potential for these CV benefits to improve athletic performance without success, but none have investigated effects on recovery.

Objectives - To examine the effect of LCn-3 on exercise performance, recovery, and CV risk in AFL players.

Design - Twenty-five AFL players completed a five week training program during which they were randomised, double-blind, to consume six g/day of fish oil (FO; n=12, HiDHA®, Numega Ingredients Pty Ltd) or sunflower oil (C; n=13). At baseline and after five weeks erythrocyte (RBC) membrane LCn-3 content and fasting serum triglyceride (TG) concentrations were assessed, and players performed two treadmill runs (R1 and R2) to exhaustion separated by five min of recovery. Heart rate (HR) was monitored throughout each treadmill run. R1 assessed running performance while R2 assessed recovery (expressed as % of R1).

Outcomes - After five weeks, RBC LCn-3 content had increased $47.4 \pm 11.2\%$ in FO ($P < 0.001$) and TG had decreased significantly compared with C (FO, $-25.4 \pm 4.9\%$, C, $4.9 \pm 7.0\%$; $P = 0.002$). HR during steady-state submaximal exercise decreased significantly in FO compared with C (FO, -8 ± 2 bpm, C -2 ± 2 bpm; $P = 0.05$). Time to exhaustion during R1 increased in both groups ($P < 0.001$) but by similar amounts (FO, $10.2 \pm 2.2\%$, C $17.3 \pm 4.3\%$; $P = 0.18$). Recovery did not change in either group (FO, $-2.6 \pm 10.9\%$, C $-13.5 \pm 6.0\%$; $P = 0.87$).

Conclusion - Five weeks of supplementing AFL players with LCn-3 reduced HR during submaximal exercise and fasting TG, reflecting improved CV function and decreased CV risk, but did not enhance endurance exercise performance or recovery.

Combined effects of omega-3 supplementation and regular exercise on body composition and cardiovascular risk factors

AM Hill, JD Buckley, KJ Murphy, DA Saint, AM Morris, PRC Howe

Nutritional Physiology Research Centre, University of South Australia and University of Adelaide, SA 5005

Background - Regular exercise and inclusion of n3 fatty acids in the diet can improve cardiovascular (CV) health.

Objectives - We examined whether the combination of both could reduce CV and metabolic risk factors more than either treatment alone.

Design - Volunteers with metabolic syndrome characteristics (mean BMI=34 kg/m²; TG=1.82 mM) were randomly assigned to take 6 g/day of HiDHA® tuna fish oil or sunflower oil (provided in blinded capsules by NuMega Ingredients) and to undertake regular exercise (walking for 45 min, 3 days/wk at 75% of age-predicted maximal heart rate) or remain relatively sedentary. Fasting plasma lipids, blood pressure and measures of arterial function and respiratory exchange ratio (RER) during exercise were assessed at baseline and after 6 and 12 weeks of intervention. Body composition was assessed by Dual Energy X-ray Absorptiometry at baseline and 12 weeks only.

Outcomes - Fish oil supplementation lowered plasma triglycerides, increased HDL cholesterol and tended to improve endothelium dependent vasodilation ($P = 0.06$), while exercise independently improved arterial compliance ($P < 0.01$). The combined treatment, however, caused a 5% loss of body fat ($P < 0.05$) - a benefit not seen with either treatment alone. The loss of fat correlated with increased fat oxidation (RER) during exercise ($P < 0.01$).

Conclusion - Fish oil and exercise appear to have a synergistic effect on body fat, indicating that omega-3 supplementation may be a useful adjunct to exercise programs aimed at improving body composition and CV risk.