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The role of long chain polyunsaturated omega-3 fatty acids in weight maintenance
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Background – Maintaining deliberate weight loss for one year is more difficult than losing the original weight, with an estimated 20% success rate. LCn-3PUFAs have a known anti-inflammatory effect and consuming fish oil results in suppressed production of pro-inflammatory cytokines. Reduced inflammation is linked to weight loss and could also assist with weight maintenance.

Objective – To determine whether consumption of LCn-3PUFAs will assist in weight maintenance.

Design – Individuals who had lost >4 kg (mean 7kg) in a 12-week double blind randomised control trial with two parallel weight loss groups continued to weight maintenance for 10 weeks in the same groups, i.e. Group 1 continued to consume 6x1g capsules/day placebo (n=6), and Group 2, 6x1g capsules/day of n-3PUFA fish oil (n=6). Fasting blood samples, anthropometric measures, 3-day food diaries, and health surveys were collected at commencement (BL) and completion (PI) of the maintenance diet.

Outcomes – Both groups maintained their weight, body composition, plasma cholesterol, HDL, LDL and triglyceride levels. Fatty acid composition of plasma lipids was not altered significantly during the weight maintenance phase in the respective dietary groups. However LCn-3PUFA (EPA \( P < 0.05 \), DHA \( P < 0.001 \)) remained higher in the fish oil group compared with the placebo group post intervention.

<table>
<thead>
<tr>
<th>Group</th>
<th>22:6n-3 (DHA) µg/mL</th>
<th>20:5n-3 (EPA) µg/mL</th>
<th>Weight kg</th>
<th>Total body fat kg</th>
<th>Fat free mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placebo</td>
<td>BL 35.2 PI 31.6</td>
<td>BL 21.1 PI 19.9</td>
<td>BL 85</td>
<td>BL 85.6</td>
<td>BL 31.5</td>
</tr>
<tr>
<td>Fish oil</td>
<td>BL 52.1 PI 45.2</td>
<td>BL 24.4 PI 16.2</td>
<td>BL 94.3</td>
<td>BL 94.3</td>
<td>BL 36.1</td>
</tr>
</tbody>
</table>

Conclusions – No correlation was apparent between the change in LCn-3PUFAs and maintenance of body weight \( (r = -.328, \text{ns}). \) Thus, the consumption of LCn-3PUFAs did not appear to assist weight maintenance. However, a study on a larger scale is required to further investigate the findings from this pilot study.

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Dose-response effect of DHA rich fish oil on resting heart rate and heart rate variability
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Background – Heart rate variability (HRV) refers to the beat-to-beat (R-R) fluctuations in heart rate (HR) mediated by changes in autonomic nervous activity. Reduction of HRV is associated with pathological conditions including hypertension and myocardial infarction. Docosahexaenoic acid (DHA) has cardiovascular health benefits but its effect on HRV is yet to be quantified.

Objectives – To investigate the effects of DHA-rich tuna oil supplementation on HRV.

Design – 37 overweight adults (17 males and 20 females aged 51 ± 2 yrs, BMI > 25 kg/m²) with elevated blood triglycerides (> 1.6 mmol/L) but otherwise healthy were recruited. Participants were divided into 4 groups and allocated to take 6 g/day sunola oil (control group) (n = 11), 2 g/day HiDHA (NuMega Ingredients; 26 % DHA+ 6 % EPA) + 4g/d Sunola (n = 8), 4 g/day HiDHA + 2g/d Sunola (n = 9) or 6 g/day HiDHA (n = 9). Resting heart rate and HRV were recorded supine at baseline and at 6 and 12 weeks after treatment. Low frequency and high frequency components of HRV were differentiated by spectral analysis.

Outcomes – Resting heart rate decreased with increasing dose of HiDHA at both 6 \( (r = -0.38, P < 0.05) \) and 12 weeks \( (r = -0.37, P<0.05) \). The Low Frequency / High Frequency ratio of HRV (reflecting the balance between sympathetic and parasympathetic nerve activity) also decreased with increasing dose of HiDHA at both 6 \( (r = -0.58, P <0.001) \) and 12 weeks \( (r = -0.40, P<0.01) \), indicating improvements in vagal control of heart rate.

Conclusion – Increased consumption of DHA can improve both resting HR and HRV.