Concurrent Session 10: Omega 3s

**Long chain polyunsaturated omega-3 fatty acids for weight loss in obese subjects**
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**Background** – Obesity is characterised by increased levels of pro-inflammatory biomarkers which are linked to CVD risk, insulin resistance and type 2 diabetes. 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.

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

**Design** – A double blind randomised control trial with two parallel groups. Both groups followed a reduced kJ diet (5000-6000 kJ) for 12 weeks. Group 1 consumed 6x1g capsules/day placebo (n=19) and Group 2, 6x1g capsules/day of n-3PUFA fish oil (n=17). Fasting blood samples, anthropometric measures, 3-day food diaries, and health surveys were collected at baseline (BL) and post intervention (PI).

**Outcomes** – Blood levels of DHA and EPA increased by 49% and 46%, respectively, in Group 2, indicating compliance with capsule consumption. There were no significant differences in changes in body weight, body composition, plasma cholesterol, HDL, LDL and triglycerides following supplementation with LCn-3PUFA.

<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>BL</td>
<td>PI</td>
<td>BL</td>
<td>PI</td>
<td>BL</td>
<td>PI</td>
</tr>
<tr>
<td>1 (n=19)</td>
<td>22.7</td>
<td>27</td>
<td>10.9</td>
<td>13.7</td>
<td>94</td>
</tr>
<tr>
<td>2 (n=17)</td>
<td>25.5</td>
<td>50.3</td>
<td>11.7</td>
<td>21.6</td>
<td>97.7</td>
</tr>
</tbody>
</table>

**Conclusions** – No correlation was apparent between the change in LCn-3PUFAs and change in body weight (r = 0.288, ns) following LCn-3PUFA supplementation. It is apparent that individual commitment to weight loss may be more effective than supplementation.

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**Regular consumption of omega-3 pork reduces triglyceride levels in healthy subjects**

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**Background** – Feeding PorcOmega® (a fortified tuna fishmeal product provided by Bartlett Grain Pty Ltd) to pigs has previously been shown to be a viable method of increasing the long chain omega-3 polyunsaturated fatty acid content of pork (1), however the health benefits of this product have previously not been evaluated.

**Objective** - To see whether omega-3 enriched pork can deliver cardiovascular health benefits to healthy adults.

**Design** – Female pigs were fed either a regular finisher diet or one containing 15% PorcOmega® for 6 weeks prior to slaughter. Meat was butchered into five cuts (leg steak, diced, stir-fry strips, mince and sausage) and packaged into 200 g serves. In a double-blind intervention trial, 33 healthy adult subjects (16 F, 17 M) were randomised to ingest either omega-3 or regular pork (one of each cut totalling 1000 g/week) for 12 weeks. Fasting blood samples were collected every 2 weeks and analysed for serum lipids, maximally stimulated thromboxane production and erythrocyte fatty acid composition.

**Outcomes** – The omega-3 enriched pork provided subjects with 1.3g of long chain omega-3 per week. This resulted in an 15% increase in erythrocyte DHA levels in the omega-3 group compared with a 5% reduction in the control group over 12 weeks (P =0.001), with no significant changes in other long chain omega-3 fatty acids. Serum triglycerides decreased in the omega-3 group compared with the control group (P =0.039) while serum thromboxane production tended to decline (P =0.059). The latter was negatively associated with the change in erythrocyte DHA incorporation (R=-0.48, P =0.008).

**Conclusions** – Modest increases in omega-3 intake resulting from regular consumption of enriched pork can deliver cardiovascular health benefits.

**References**
Howe et al., 2002. Tuna fishmeal as a source of DHA for n-3 PUFA enrichment of pork, chicken, and eggs. Lipids;37:1067-76