

## Concurrent Session 10: Omega 3s

### Long chain polyunsaturated omega-3 fatty acids for weight loss in obese subjects

IA Munro, C Smith, ML Garg

Nutraceuticals Research Group, School of Biomedical Sciences, University of Newcastle, NSW 2308

**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.

Group	22:6n-3 (DHA)		20:5n-3 (EPA)		Weight		Total body fat		Fat free mass	
	µg/mL		µg/mL		kg		kg		kg	
	BL	PI	BL	PI	BL	PI	BL	PI	BL	PI
1 (n=19)	22.7	27	10.9	13.7	94	90.4	39.2	35.9	53.7	54.5
2 (n=17)	25.5	50.3	11.7	21.6	97.7	94.7	40.9	38	56.8	56.7

**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.

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

AM Coates<sup>1,2</sup>, S Sioutis<sup>3</sup>, JD Buckley<sup>1,2</sup>, PRC Howe<sup>1,2</sup>

<sup>1</sup>Nutritional Physiology Research Centre, University of South Australia, SA 5001; <sup>2</sup>ATN Centre for Metabolic Fitness; <sup>3</sup>Discipline of Physiology, School of Molecular Life Sciences, University of Adelaide SA 5001

**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 a 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