

## Concurrent Session 11: Fish and Omega-3 Fatty Acids

### Plasma n-3 polyunsaturated fatty acids and weight status in free living adults

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**Background** – Excess adipose tissue poses an increased risk for diseases including insulin resistance, type 2 diabetes and CVD. Dietary supplementation with n-3 polyunsaturated fatty acids (n-3PUFA) has been shown to reduce triglycerides and inflammatory biomarkers that are associated with increased adiposity.

**Aim** – The objective of this study was to explore the relationship between anthropometric measures and plasma n-3PUFA concentrations in free living adults.

**Design** – An observational cross sectional study in 124 male and female adults stratified by weight according to BMI (healthy weight  $n=21$ , overweight  $n=40$  and obese  $n=63$ ) was conducted. The relationship between plasma n-3PUFA concentration with BMI, waist and hip circumference, waist-to-hip ratio and body fat mass was examined,

**Results** – Obese individuals had a significantly lower concentration of plasma total n-3PUFA ( $4.53 \pm 0.14$  vs.  $5.25 \pm 0.32$ ,  $P=0.05$ ) compared to the healthy weight group. In the obese group, BMI, waist and hip circumference were inversely correlated with total n-3PUFA, C20:5n-3 and C22:6n-3 ( $P<0.05$  for all), and C22:5n-3 was correlated with body fat mass ( $r=0.36$ ,  $P<0.001$ ). No significant relationships were observed between plasma n-3PUFA and anthropometric measures for the healthy weight and overweight groups. When individuals were stratified by quartiles of total n-3PUFA concentration, a significant inverse trend was observed for BMI ( $P=0.002$ ), waist ( $P=0.01$ ) and hip ( $P<0.001$ ) circumference.

**Conclusion** – In obesity, higher plasma levels of n-3PUFA are associated with a healthier BMI, waist and hip circumference. Our findings of association between plasma n-3PUFA and measures of anthropometry suggest that n-3PUFA play an important role in adiposity and weight status.