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### Relationship of obesity and abdominal adiposity with plasma C-reactive protein, interleukin-6 and omega-3 polyunsaturated fatty acids

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**Background** – Obesity, specifically abdominal adiposity is associated with elevations in C-reactive protein (CRP) and interleukin-6 (IL-6). Omega-3 polyunsaturated fatty acids (n-3PUFA) supplementation has been shown to reduce circulating levels of CRP and down regulate IL-6 expression.

**Objective** – To investigate the relationship between plasma concentration of CRP, IL-6 and n-3PUFA with obesity and measures of central adiposity.

**Design** - A cross-sectional observational study involving 124 adults (male  $n=46$  and female  $n=78$ ). Waist and hip circumference were measured to the nearest 0.1cm. Plasma n-3PUFA (% total fatty acid) was measured by gas chromatography and CRP and IL-6 by were analysed using high sensitivity immunoassays in fasting plasma samples.

**Outcomes** – The relationship between CRP, IL-6, and anthropometric measures was investigated. There was a positive correlation for CRP with BMI ( $P=0.02$ ), waist ( $P=0.05$ ) and hip ( $p=0.01$ ) circumference and similarly for IL-6 with BMI ( $P=0.01$ ) and hip ( $P=0.01$ ) circumference. When CRP were split into tertiles, a negative correlation was found with total n-3PUFA ( $P=0.007$ ), EPA ( $P<0.0001$ ) and DPA ( $P=0.003$ ) concentration. Furthermore, post hoc analysis shows significant differences between the lowest and highest tertiles for total n-3PUFA ( $P=0.01$ ), EPA ( $P<0.0001$ ) and DPA ( $P=0.02$ ).

**Conclusion** – Individuals with higher abdominal adiposity have elevated CRP and IL-6 levels and reduced n-3PUFA concentration. The consumption of n-3PUFA is reflective of a healthier weight status and a desirable inflammatory profile.

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### High protein-high red meat and high carbohydrate weight loss diets do not differ in their effect on faecal water genotoxicity

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**Background** – It has been suggested that high protein-high red meat diets are associated with an increased risk of colorectal cancer due to the higher content of red meat. However, the study of the overall dietary and lifestyle pattern may prove more important than any individual component when assessing CRC risk.

**Objectives** – Compare the impact of a high protein-high red meat (HP) diet versus a high carbohydrate (HC) diet on faecal water genotoxicity, measured using the cytokinesis-block micronucleus cytome assay in WIL2-NS cells, and other conventional bowel health biomarkers in overweight men.

**Design** – 33 obese men (mean age 54y, mean BMI 32kg/m<sup>2</sup>) were randomized to a HP or HC dietary pattern. Faecal samples were collected at base-line, after 12 weeks intensive weight loss and after 9 months weight maintenance on the diets and assessed for bowel health biomarkers.

**Outcomes and Conclusions** – Both diets resulted in an average weight loss of  $9.3 \pm 0.7$ kg after 12 weeks with no further significant change in weight after 9 months. Two-way ANOVA showed a significant effect with time ( $P<0.001$ ) but not diet for total DNA damage, with a reduction in genotoxicity after 12 weeks intensive weight loss, and a subsequent increase at the end of 9 months weight maintenance to levels not significantly different from baseline. There was no significant effect for time or diet on faecal pH, short chain fatty acid excretion, phenol or p-cresol. Results from this study suggest that HP and HC weight loss diets may modify the carcinogenic profile of the bowel contents such that weight loss may exert a beneficial effect by reducing genotoxic load in the short term; however these results require verification against a non-weight loss control.