Posters

**Intra-individual variations in energy metabolism of free living overweight and obese individuals: significant effects despite weight stability**

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**Background** - Measurements of energy expenditure and substrate utilization are essential to understanding the metabolic basis of obesity, and the physiological responses to perturbations in habitual food intake.

**Objective** - To document the intra-individual variation to a high calcium mixed test meal in older obese.

**Design** - Eight free living subjects (five females and three males; mean ± SEM, age 57.6 ± 0.83 yr, & BMI 31.86 ± 2.12 kg/m²) had resting (1 hr) and postprandial responses (5 hr) to the same test meal measured on two occasions 19.4 ± 0.2 weeks apart. Resting metabolic rates (RMR), postprandial energy expenditure (PPEE), fat oxidation rates (FOR) and carbohydrate oxidation rates (COR) were assessed. Two reliable DEXA models (1) were used to track body composition (visit 1:DPX-IQ, visit 2:Prodigy). Data was analysed using paired t tests and one-way ANOVA with covariates.

**Outcomes** - Despite stability of weight and waist circumference, there was a significant decrease in FM (39.8 ± 3.14 vs. 36.9 ± 2.90 kg, \( P = 0.017 \)) and an increase in FFM (53.4 ± 5.53 vs. 57.1 ± 5.69 kg, \( P = 0.003 \)). These effects were beyond expected differences between models.\(^1\) RMR and basal COR were not different between visits, unadjusted or adjusted for FFM and FM. In contrast, both unadjusted (\( P=0.009 \)) and adjusted basal FOR was significantly different (\( P=0.013 \)). Intra-individual variations (partial \( \eta^2 \)) accounted for 41.0% of total variance in FOR. Postprandial COR and FOR adjusted for basal values, were not different between visits. However, postprandial energy expenditure adjusted for RMR, was different between visits (\( P=0.05 \)), with intra-individual variations accounting for 26.5% of the total variation in PPEE.

**Conclusions** - In this study, weight stability was not synonymous with stability of energy metabolism.

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**References**


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**Depletion and recovery of docosahexaenoic acid are region-specific in rat brain**

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**Background** - Docosahexaenoic acid (DHA) is the most abundant fatty acid in brain and retina. Depletion of DHA in brain has been associated with a loss in nervous system function in experimental animals as well as in human infants fed vegetable oil-based formulas. Since the different regions of brain have the special biological functions, any change in the composition of fatty acids is likely to influence the cellular function, which in turn may cause certain neural deficiencies.

**Objective** - To examine whether alpha-linolenic acid deficiency induces regional depletion and recovery of DHA in rat brain.

**Design** - DHA depletion was induced by feeding rats with a n-3 fatty acid deficient diet for two generations. The F2 n-3 deficient rats at weeks 5 were switched to the n-3 adequate diet for 12 weeks. The rat brain was dissected into 7 parts, namely cerebellum, medulla oblongata, hypothalamus, striatum, hippocampus, cortex and midbrain. The fatty acid composition of the different regions in rat brain at various time points was analyzed using gas-liquid chromatography.

**Outcomes** - DHA was not proportionally depleted in various regions of brain when the rats were maintained on an n-3 deficient diet for two generations. The results demonstrated that cortex, hippocampus, striatum, cerebellum and hypothalamus had DHA depleted by >71%, whereas midbrain and medulla had only 64% and 57% DHA depleted, respectively. The most important observation was that the diet reversal for 12 weeks had DHA recovered completely in all regions except for medulla where the recovery was only 62%.

**Conclusion** - Location of DHA, n-3 deficiency-induced DHA depletion and reversibility of DHA deficiency across the brain were region-specific.