Concurrent Session 9A: Diet Intervention Studies/Obesity

Losers versus gainers: Is insulin the coach?

KA Cojean[1], JM Batch[2], JC Cardinal[3], PSW Davies[1], H Truby[1]

[1] *The Children's Nutrition Research Centre, University of Queensland, Qld 4029*
[2]*Dept of Endocrinology and* [3]*Pathology Services, Royal Children's Hospital, Brisbane, Qld 4029*

Background – Insulin resistance has been associated with obesity. It has also been suggested that those who display insulin resistance are more likely to gain weight and have difficulty losing weight.
Objective – To explore the potential relationship between insulin status at baseline and weight loss success in a group of free living obese adolescents who took part in a 12 week weight management program.
Design – Subjects were recruited from 'Eat Smart' – a study investigating dietary approaches in the treatment of adolescent obesity. Fasting blood samples were taken at the baseline assessment prior to commencing the dietary program. Blood was analysed for glucose and insulin as part of a multiplexed immunoassay using a Luminex 100IS. Homeostasis model assessment of insulin resistance (HOMA-IR) was calculated using the computer model (Diabetes Trials Unit, the University of Oxford).
Outcomes – Twenty five subjects (65% female); mean age 13.3 years and mean body mass index (BMI) 33.6 kg/m^2 (SD 7.2; range 24.8 – 48.7) commenced the program. Response to energy restriction was variable and participants were classified as responders (lost weight) and non-responders (gained weight). In the responders, mean weight change was -3.6kg (SD 2.5) and the non-responders +1.96kg (SD 1.8), this equated to a BMI change of -1.8 kg/m^2 (SD 0.8) and 0.09 kg/m^2 (SD 0.8), respectively. At baseline, weight and BMI was not significantly different between the groups. Those who responded to energy restriction presented with lower levels of plasma insulin (15.2 mU/L vs. 21.1 mU/L), which was also reflected in their calculated HOMA-IR scores of 1.9 vs. 2.8 ($p<0.05$). Final assessment showed that the responders had a significant reduction ($p<0.04$) in plasma insulin, 15.2 to 10.7 mU/L compared to the non-responders at 21.1 to 23.4 mU/L, insulin resistance scores also decreased ($p=0.07$) in those who lost weight.
Conclusion – These preliminary results indicate that plasma insulin and insulin resistance may predict likely success in weight loss, however further investigation is needed to elucidate other contributing factors

Perceived satiety – does food architecture matter?

MK Zalifah[1], B D'Arcy[1], NA Caffin[1], MJ Gidley[2]

[1]*School of Land, Crop and Food Sciences, University of Queensland, St. Lucia, QLD 4072*
[2]*Centre for Nutrition and Food Sciences, University of Queensland, St. Lucia, QLD 4072*

Background – The rise in obesity and associated disease states has triggered numerous studies of satiety. However, the specific effects of food architecture of iso-energetic meals on perceived satiety have yet to be explored in depth.
Objective – To determine the effect of food architecture on perceived satiety for three types of breakfast meals.
Design – Iso-energetic (1000kJ) breakfast meals based on beef, oatmeal or fruits with different food architectures were given to volunteers in three phases of study. Cooked beef was given as steak (BP), mince (BM) and sausage (BS). Oats were served with milk cooked either whole (WO) or after milling (MO). Three meals were prepared for fruits; whole (WF), chopped (CF) and blended (BF). In each phase, 29 lean subjects (18 female, 11 male) participated. Subjects assessed each architectural type in a randomised order after method familiarization using commercial cereal and milk. Subjects fasted overnight and consumed test breakfasts with 200ml water. Satiety ratings were recorded on a pre-constructed labelled magnitude scale (Zalifah *et a*l., Food Quality and Preference, 19, 574, 2008) every 15 mins up to 90 mins and then every 30 mins up to 180 mins after breakfast.
Outcomes – Before the meal (0 min), subjects felt moderately hungry. 15 mins after breakfast, the highest scores were found for WF and BF (very full) and the lowest scores were for WO (slightly full) and MO (neither hungry nor full - NHNF) after MO. The order in which hunger perceptions returned was MO (45-60 min), WO (75-90 min), BM, BS, CF, BF (90-120 min) and BP, WF (120-150 min). Statistically significant differences in satiety scores ($p<0.05$) with food architecture were found at several time points for fruit and oatmeal meals, but not for beef-based meals. The most intact foods in a group (whole fruit/oats, steak) resulted in the longest time to hunger perception.
Conclusion – Food architecture has a major effect on the perception of satiety. For the food groups studied, the intactness of biological structure has at least as important a role as macronutrient composition in determining satiety.