

## **The effect of protein source (dairy vs mixed) in high protein, energy restricted diets on body composition, vascular health and metabolic markers in overweight adults**

J Bowen<sup>1</sup>, M Noakes<sup>1</sup>, P Clifton<sup>1</sup>

<sup>1</sup>*Clinical Research Unit, CSIRO Health Sciences & Nutrition, PO Box 10041, Adelaide, SA*

**Background** – An increase in the protein/carbohydrate ratio in low calorie diets has been linked with improved metabolic profile. It is unclear if the source of dietary protein exerts any effects. There is limited evidence that high calcium diets may facilitate body fat loss.

**Objective** - This study examined whether a high dairy protein/calcium diet versus a mixed protein/low calcium diet affected weight loss and cardiovascular and liver function markers.

**Design** - The parallel study consisted of a 12-week phase energy restriction followed by a 4-week energy balance phase. Fifty adults (BMI  $33.4 \pm 2.1$  kg/m<sup>2</sup>) followed isocaloric diets (5.5MJ/day, 34% protein, 41% carbohydrate, 24% fat) high in dairy (DP, 2400mg Ca/d) or mixed protein (MP, 500mg Ca/d). Body composition, glycemic control, serum lipids, blood pressure and markers of vascular and liver function were measured throughout the study.

**Outcomes** – There was no effect of protein source on net weight loss or body composition ( $-9.7 \pm 3.8$  kg,  $p = 0.8$ ). Prior to weight loss, glycemic response to DP or MP test meals was 30% lower in subjects on the DP diet. Fasting total and LDL-cholesterol, triglycerides, insulin and blood pressure decreased after weight loss ( $-0.41 \pm 0.07$  mmol/L,  $-0.36 \pm 0.1$  mmol/L,  $-0.23 \pm 0.06$  mmol/L,  $-1.4 \pm 0.6$  mU/L,  $-9.4/-2.5$  mmHg  $p < 0.01$ , respectively) independent of protein source. There was an improvement in some markers of liver function as well as markers of vascular function (GTT, AST, PAI, sICAM, tPA) with weight loss ( $-20.1 \pm 4.1$  %,  $-11.2 \pm 17$  %,  $-15.2 \pm 7.3$  %,  $-6.9 \pm 2.2$ %,  $+25.9 \pm 6.2$  %, respectively  $P < 0.01$ ).

**Conclusions** – Both diets resulted in improvements in cardiovascular risk markers and liver function. Neither protein source nor dietary calcium significantly affected weight loss or body composition. The DP test meal resulted in a slightly more favourable glucose response.