

Concurrent Session 11

Effects of dietary protein type on energy intake and appetite regulatory hormonesJ Bowen, M Noakes, P Clifton
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Background - Dietary protein is associated with greater satiety relative to carbohydrate (CHO), however it is unclear if this relationship is affected by the type of dietary protein.

Objective - To determine whether appetite, ad libitum energy intake (EI) and post prandial satiety hormones are affected by protein type, relative to glucose.

Design - Seventy-two men, BMI 27.7 ± 0.5 kg/m² (range 20.7-40.0) consumed a liquid preload (1.1 MJ, 400 ml) containing 50 g of whey protein isolate, soy protein isolate, gluten or glucose a randomised order. Subjective appetite was measured for 3 h after preloads (0, 15, 30, 45, 60, 90, 120 and 180min) followed by a buffet lunch to assess ad libitum EI. Plasma cholecystokinin (CCK) and glucagon-like peptide-1 (GLP-1), (satiety hormones), ghrelin (a 'hunger' hormone) were measured in a subset of participants (n = 38) after each appetite measurement.

Outcomes - EI was higher (+ 401 ± 67 kJ) after the glucose preload compared to all protein preloads (glucose 3546 ± 168 kJ; soy 3209 ± 160 kJ; whey 3219 ± 147kJ; gluten 3006 ± 147 kJ $P < 0.0001$), although appetite ratings were not affected by treatment. GLP-1 and CCK were higher and ghrelin was lower after all protein treatments compared to glucose (time by preload effect, $P < 0.01$), independent of protein type.

Conclusions - Ad libitum EI is reduced after consumption of dietary proteins relative to glucose, independent of protein type. This difference may be mediated by the gastrointestinal derived hormones CCK, GLP-1 and ghrelin which are involved in appetite regulation.

This study was funded through the National Centre of Excellence for Functional Foods

The relationship of nutrient intake to blood pressure in femalesCA Nowson¹, J Conn, M Lucas, JD Wark²¹ School of Exercise and Nutrition Sciences, Deakin University, Burwood, Victoria, Australia² The Department of Medicine, University of Melbourne, Melbourne, Victoria, Australia

Background - Data from epidemiological studies have indicated that a number of dietary factors have been found to be associated with blood pressure and body composition, eg protein, fibre and electrolytes.

Objective - To assess the relationship between nutrient intake and blood pressure in women with a body mass index (g/m²)(BMI) between 18 – 40; young women (YW) aged 18 - 40.5 years and older women (OW) between 41 – 65years.

Design - Cross-sectional sample of female twins and sisters participating in a longitudinal study assessing the predictors of risk factors for osteoporosis and cardiovascular disease. Subjects completed a 4-day food record (household measures), questionnaires on lifestyle practices, blood pressure measurement and underwent a Dual Energy Absorptiometry measurement to assess body composition.

Outcomes - The table indicates the mean (SD) for a selection of descriptive measures of the study populations. There was a positive association of age and BMI and systolic pressure (SBP) for OW and for BMI for YW (OW: $R^2=0.2$, Age $\beta=1.0$ (0.1), BMI $\beta=0.7$ (0.2), YW: BMI $R^2=0.09$, $\beta=0.8$ (0.1), adjusting for age, BMI in OW, protein intake was negatively associated with SBP ($\beta=-0.11(0.04)$ $P=0.017$, as was dietary calcium ($\beta=-0.005(0.003)$ $P=0.044$, fibre ($\beta=-0.3(0.1)$ $P=0.009$, and magnesium ($\beta=-0.04$ (0.1) $P=0.001$. Therefore a one SD increment in magnesium, fibre, protein and calcium was associated with a decrease in SBP of 3.2, 2.1, 2.0 and 1.5mmHg respectively.

Mean (SD)	Age (yrs)	BMI (g/m ²)	Energy (MJ)	% Energy fat	Protein (g)	Calcium (mg)	Magnesium (mg)	Fibre (g)
YW (n=312)	31.6(7.0)	24.5(4.2)	7.8(2.1)	32.4(6.8)	77.3(22.1)	806.6(320.2)	263.2(80.7)	47.4(7.9)
OW (n=271)	48.0(5.9)	26.3(4.6)	7.6(1.8)	32.5(6.2)	79.2(18.6)	790.0(303.0)	274.5(79.3)	45.6(7.0)

Conclusion - In younger women it is difficult to detect any effect of dietary intake on blood pressure, although BMI did contribute to a higher SBP. In older women, in addition to age and BMI, and after adjustment for these factors dietary magnesium, fibre, protein and calcium and were all inversely associated with blood pressure. This confirms the result of previous studies, primarily conducted in men, that a diet containing significant amounts of magnesium, calcium and protein is also associated with lower levels of blood pressure in older women.