

Concurrent Session 14

Phenolic-rich palm fruit juice raises plasma HDL-C concentrations and improves antioxidant status in Golden Syrian hamsters fed an atherogenic dietN Balasundram^{1,2}, K Sundram², S Samman¹¹Human Nutrition Unit, School of Molecular and Microbial Biosciences, University of Sydney, NSW 2006²Malaysian Palm Oil Board, 6 Persiaran Institusi, 43000 Kajang, Malaysia

Background - Consumption of phenolic compounds is reported to exert a favourable effect on plasma lipids. We showed previously that a phenolic-rich extract from palm fruit inhibits liposomal oxidation and protects against oxidation of human erythrocytes.¹

Objective - To investigate the effects of consuming palm fruit juice (PFJ) on plasma lipids and antioxidant status of Golden Syrian hamsters (*Mesocricetus auratus*) fed a high-fat, high-cholesterol (1.5g/kg) atherogenic diet.

Design - Male hamsters, 4-wk old, were assigned randomly to four groups and fed the atherogenic diet *ad libitum* for 8 wk. The Control group was provided with water while the three other groups were provided PFJ at 3 different doses: 500, 1000, or 1500 mg gallic acid equivalents (GAE)/L. At the end of 8 wk, fasting plasma total cholesterol (TC), triglycerides (TG), HDL-C and non-HDL-C concentrations were determined. Plasma antioxidant capacity was measured by its ferric reducing antioxidant power (FRAP).

Outcomes - Consumption of PFJ at the higher dose (1500 mg GAE/L) increased plasma TC, HDL-C and FRAP significantly compared to Control and other treatment groups. Plasma TG and non-HDL lipid levels were unaffected.

| | Control (n=12) | 500 mg/L (n=11) | 1000 mg/L (n=14) | 1500 mg/L (n=12) |
|---------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| TC (mmol/L) | 4.15 ± 0.58 ^a | 4.00 ± 0.91 ^a | 4.67 ± 1.07 ^a | 4.86 ± 0.60 ^b |
| HDL-C (mmol/L) | 3.28 ± 0.53 ^a | 3.17 ± 0.77 ^a | 3.80 ± 0.82 ^a | 3.98 ± 0.47 ^b |
| FRAP (µg Trolox equivalents/mL) | 11.42±6.25 ^a | 9.53±4.08 ^a | 14.06±6.62 ^a | 18.94±11.42 ^b |

(Values are means ± SD, values in the same row with different superscript differ significantly, $P < 0.05$).

Conclusions - The consumption of PFJ containing 1500 mg GAE/L contributes to lowering the risk of heart disease by increasing plasma HDL-C levels and improving antioxidant status. The effect of PFJ appears to be dose-mediated and the exact mechanism of action needs further evaluation.

References

1. Balasundram N, Agar NS, Sundram K, Samman S. Palm fruit extracts protect against oxidative damage in human red blood cells. *Asia Pac J Clin Nutr* 2004; 13 (Suppl) : S75.

Isoflavones influence the extent of plasma cholesterol reduction by soy proteinA Thorp¹, A Morris¹, J Buckley¹, T Mori², J Hodgson², B Meyer³, P Howe¹¹ Nutritional Physiology Research Centre, University of South Australia & University of Adelaide, SA 5005² Dept of Medicine, University of Western Australia, WA 6847³ Dept of Biomedical Science, University of Wollongong NSW 2522

Background - Regular consumption of soy protein (SP) has been shown to significantly reduce plasma total cholesterol (TC) and triglycerides (TG). However, the potential contribution of isoflavones (ISO) associated with the SP to its lipid lowering effects remains unclear. The relative requirements for SP and ISO are critical to the development of more palatable soy products that can deliver this health benefit.

Objectives - To enhance the palatability of soy by combining it with dairy so that daily consumption of soy is more readily achievable by consumers. To assess the relative impact on plasma lipids of regular consumption of soy and soy/dairy formulations.

Design - A double blinded randomised crossover intervention trial incorporating three 6-week long dietary phases in 35 volunteers with elevated TC (>5.5mM). The trial was designed to compare cardiovascular benefits of eating soy foods (S) or soy/dairy combination foods (S/D) with that of dairy foods (D). Intended daily nutrient intakes from foods on each diet were 24g of SP + 80mg of ISO on the S diet, 12g of both SP and dairy protein (DP) + 80mg of ISO on the S/D diet and 24g of DP on the D diet.

Outcomes - ISO intakes on the S and S/D diets were less than anticipated (57 and 70mg/day respectively). TC was 4.4% lower ($P < 0.05$) while subjects consumed S compared to D but was unaltered by the S/D diet, despite a higher daily ISO intake. The S diet also tended to improve LDL, HDL and TG levels. Regression analysis revealed that the extent of TC reduction was dependent on an individual's intake of ISO ($P < 0.05$).

Conclusions - Combining DP with SP has the potential to enhance consumer acceptability of soy products. However, soy protein intakes exceeding 12g/day appear necessary to significantly reduce TC. The magnitude of reduction is dependent on the concomitant ISO intake.