

Posters

Possible developmental and reproductive toxicity of isoflavones in soybean and Kudzu root

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Background - Numbers of researches over the last decades have suggested protective effects of soybean compounds against some chronic diseases, the root of Kudzu had been used to treat coronary heart disease, heart failure, and hypertension in Asian countries. It is found that the major effective component of the two plants is isoflavones, which possess both estrogenic and anti-estrogenic activity. However, a number of side effects have been also postulated, as well as mechanisms by which such effects may be mediated.

Objective - To investigate the possible developmental and reproductive toxicity of isoflavones in soybean and the root of Kudzu.

Design - SD rats (4 weeks of age) were used as an animal model to study the potential developmental and reproductive toxicity of isoflavones to immature animals. Both male and female rats were gastrogavaged daily with different doses of isoflavone extracts from soybean and kudzu root (30, 150, 300, and 600 mg/kg body weight), respectively, for three months.

Outcome - Feeding for 3 months led to reduced body weight gain compared with the control group in both genders with dose-related relationship. Administration of soybean and kudzu root isoflavones also caused an increased relative weight of main reproductive organs in both genders. The two kinds of isoflavones could decrease both estradiol and progesterone concentrations statistically in female rats with the increasing dosage. For soybean isoflavones, both estradiol and progesterone levels in high dose group (600 mg/kg body weight) would be reduced by 72% and 45%, respectively, compared with the controls. Male rats had not only total testosterone levels but also sperm count significantly decreased by 64% and 50%, respectively, in high dose group compared with the control group administered with the soybean isoflavones.

Conclusions - High dose of isoflavones affected not only growth but also development of reproductive system at least in rats.

Resting and postprandial substrate utilisation following high protein and high carbohydrate weight maintenance diets: interactive effects of diet and insulin resistance

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Background - The effects of weight loss per se, as well as insulin sensitivity, may confound adaptive changes in energy metabolism to manipulation of macronutrient intake.

Objective - We examined the changes in energy metabolism during high protein and high carbohydrate weight maintenance diets, and assessed the role of insulin sensitivity in these effects.

Design - 19 lean to obese subjects (11 men, 8 women) completed a double stranded, 6-week weight maintenance trial. Subjects were randomised to receive either a low protein (12%)–high carbohydrate (53%) diet (HC), or a high protein (25%)–low carbohydrate (40%) diet (HP). Resting energy expenditure (REE), postprandial thermogenesis (PPT), fat oxidation rate (FOR), and carbohydrate oxidation rate (COR) were measured before and after each arm of the study. Based on HOMA-R at entry, Group 0: <1.68 & Group 1: ≥ 1.68 were generated. Within-subject modelling, with adjustment for covariates, determined statistical significance at the 5% level.

Outcomes - The subjects randomised to the HP diet were significantly older by 14 yr, but there was no difference in the change in weight or body composition. Change in quantitative insulin check index (QUICKI) adjusted for age, mean fat free mass (FFM) and fat mass (FM), was significantly different between diets with a significant diet x group interaction. In the fasting state there was no difference between diets in the change of adjusted REE, FOR or COR. There was however a significant diet x group interaction in both adjusted FOR and COR. Postprandial metabolism adjusted for basal values, was not different between diets. A significant diet x group interaction was however observed for postprandial COR. The latter indicated that the HC diet stimulated COR in Group 0 relative to Group 1, while the HP diet did the reverse.

Conclusions - Insulin sensitivity, as judged by QUICKI, varied as a function of the macronutrient composition of the diet and insulin resistance status during stability of body composition. This diet x phenotype interaction was also present in changes to basal and postprandial substrate oxidation.

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