

Concurrent Session 5: Functional Foods II

The effects of cocoa, coffee, tea and fenugreek on diet-induced obesity in mice

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Objective – Previous studies have shown that many common drinks can influence the development of obesity and insulin resistance. The aim of the present experiments was to investigate the effects of cocoa, coffee, green tea and fenugreek, when incorporated into a high fat diet, on growth, body composition and insulin sensitivity of obesity-prone mice (C57BL/6J).

Design – Sixty 8-week old male C57BL/6J mice were housed individually and maintained on a high fat diet (21% fat) and randomly assigned to one of four treatment groups (cocoa, coffee, green tea or fenugreek; 2% of the diet w/w) or a control group (no addition to the diet). Body weight was recorded weekly and water and food intake recorded daily. A glucose tolerance test was performed at week 14 and body composition was determined at week 16 by dual-energy x-ray absorptiometry (DEXA). Mice were killed at week 18 and blood samples collected for analyses of plasma metabolites.

Outcomes – Weight gain by mice in the green tea group was significantly lower (20%) than that in the control group. Body composition analysis by DEXA showed that the mice in the green tea group had 18% higher lean mass and 38% lower fat mass when compared to control group. Neither the weight gain nor body composition was affected by cocoa, coffee or fenugreek. Glucose tolerance test showed no differences in any of the treatment groups when compared to control. Plasma non-esterified fatty acids concentration was significantly elevated (28%) in the green tea group consistent with increased lipolysis.

Conclusions – The results show that addition of green tea to foods may help prevent obesity induced by high fat diets.

The effects of dairy proteins and peptides on satiety in humans

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Background – It is widely believed that protein is more satiating than either carbohydrate or fat, which might improve compliance with energy restricted diets. The satiating effect of dairy proteins may be due in part to the peptides derived from them and their physiological actions relevant to food intake regulation. Such a candidate peptide is glycomacropeptide (GMP).

Objective – To investigate the effects of whey proteins and glycomacropeptide (GMP) on food intake and subjective appetite in healthy humans.

Design – The study was designed as a randomised crossover Latin Square design. On 4 separate days, fifty healthy subjects received a subject-specific standardised breakfast, an iso-caloric test drink (time 0) and lunch. The test drink consisted of maltodextrin carbohydrate (control), whey protein isolate (WPI) with no GMP, WPI with naturally present 21% GMP (21% GMP WPI) or 21% GMP WPI and added GMP. Appetite profile was determined using visual analogue scales (VAS) and subsequent food intake was measured at the lunch meal (cafeteria method).

Outcomes – Subjects consumed a similar amount of food during lunch after the 4 drinks although there was a tendency within the females towards a lower food intake at the highest GMP level. The VAS data (0-30 min) indicated that the GMP-containing drinks induced a lower appetite and a greater feeling of fullness ($P<0.05$) compared with the WPI with no GMP.

Conclusions – Dairy proteins and GMP appear to influence satiety over a short-term period. Further studies are needed to understand the role of dairy proteins and peptides in the regulation of food intake with more focus on satiety hormones.