Clinical Citation

Effect of beverage containing green tea catechins, calcium and caffeine on 24-h EE and fat oxidation in humans.

Tappy et. al. (Publication Pending)

Abstract

Objective: The study evaluated whether an Enviga prototype test beverage containing green tea extract, calcium, and caffeine could increase fat oxidation and energy expenditure (EE) over a 24-h period in humans with normal body weight when tested in a randomized, placebo-controlled, double blind, crossover, single-center clinical trial.

Design: Thirty-one healthy, non-smoking, normal volunteers, consisting of 15 men and 16 women of ages 18 to 35 years of age with body mass indices (BMI) between 19 and 25 kg/m^2 consumed 250 ml of the test beverage 3 times daily, between meals, for 3 days, with 1 month between the crossover tests. Consumption of the test beverage resulted in the intake of 540 mg/day of total catechins (282 mg/day of epigallocatechin gallate), 300 mg/day of caffeine, and 633 mg/day of calcium.

Method: The fasting, resting metabolic rate (RMR) of each subject was measured and used to calculate the subject's Daily Energy Intake (DEI). The subjects' diets consisted of normal food items and the DEI was exceeded by the energy contained in the placebo or the test product. On day 3 of the test period, each subject's EE and substrate oxidation (protein, carbohydrate, and fat oxidations) were measured in an indirect calorimeter chamber over a 23-h period (which were then extrapolated to 24-h) under conditions that were slightly more sedentary than normal everyday life. Blood pressure and heart rate were measured as surrogate markers of sympatho-adrenal activity at regular intervals throughout the day, and total urine was collected for the day and night periods and was analyzed for total urinary nitrogen (a measure of whole body protein oxidation) and urinary catecholamine excretion.

Results: Three servings of the Enviga prototype test beverage significantly increased 24-h EE by 106 kcal/day, +/- 31 (SEM) ($P<0.01$) between the subjects receiving the test beverage and those receiving controls. No significant difference was observed in carbohydrate, fat, or protein oxidation rates, heart rate, blood pressure or urinary catecholamine excretion. These results indicate that 3 servings/day of the test beverage significantly increased in 24-h EE, without any adverse effects on heart rate or blood pressure.