Contribution of caffeine to plasma antioxidant capacity after coffee intake in humans: a preliminary study

Nathália Moura-Nunes1; Adriana Farah1,2, Carmen M. Donangelo1,3, 1Instituto de Química, 2Instituto de Nutrição, Universidade Federal do Rio de Janeiro, RJ, Brazil; 3Escuela de Nutrición y Dietética, Universidad de la República, Montevideo, Uruguay

Coffee is one of the beverages with highest antioxidant capacity (AC). The main compounds responsible for this property are the chlorogenic acids. However, it has been suggested that caffeine metabolites would play an important role in the increase in human plasma AC after coffee intake. This study aimed to evaluate the contribution of caffeine to plasma AC after coffee intake. In a cross-over designed study, four women were submitted to a single dose of three brewed coffee treatments: regular (R), decaffeinated (D) and decaffeinated with caffeine added artificially (DC). All beverages contained the same total CGA content (1,4g) as well as caffeine content (0,4g). Blood samples were collected before and 0,5h; 1h; 1,5h; 2h; 3h; 4h; 5h and 6h after coffee intake. The values of plasma ferric reducing ability (FRAP) were compared by ANOVA and the concentrations of caffeine and metabolites were measured. FRAP response was higher ($p<0.02$) in DC treatment (158±49 h.µmol Fe$^{2+}$/L) than in R (18±108 h.µmol Fe$^{2+}$/L) and D (-60±67 h.µmol Fe$^{2+}$/L) treatments. Caffeine plasma concentrations were not different between R and DC treatments, indicating that caffeine bioavailability was not altered when added artificially. However, plasma concentration of caffeine metabolites tended to be higher in the DC treatment, suggesting that caffeine isolated from the matrix was faster metabolized than when in the matrix, allowing and increase in metabolites concentration during the 6h. The present preliminary results suggest that caffeine and its metabolites contribute to the antioxidant effect of CGA in human plasma after coffee intake.

Financial Support: FAPERJ, CNPq (Brazil)