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Consuming coffee with milk and sugar added before a high glycemic index meal improves postprandial glycemic and insulinemic responses

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Abstract
Literature regarding the health effect of coffee consumption was contradicting, whereby it was found to protect against type 2 diabetes while inducing acute glucose intolerance. Previous studies suggested that adding sugar and milk into coffee may alter the effect of its consumption on glucose metabolism, potentially explaining the contradiction, but this is seldom investigated. This study aimed at assessing the effect of adding milk and sugar into coffee on the postprandial glycemic metabolism after a subsequent, high glycemic index (GI) meal. A total of 11 apparently healthy adults were recruited for this randomized, cross-over acute feeding study. In each experimental session, overnight-fasted participants consumed one cup of the following drinks: espresso (35 ml), instant, boiled, and decaffeinated coffee (all 150 ml). Then they consumed a high GI meal and blood samples were collected every 15–30 minutes in the subsequent two hours. Each type of coffee was tested for 3 times, twice with 50 g low-fat milk and 7.5 g white sugar added (i.e. white coffee) and once without (i.e. black coffee). Postprandial levels of glucose, insulin, and active GLP-1, as well as the incremental area-under-curve (iAUC) of the biomarkers, were compared between black and white coffee, with baseline measurements as a covariate. Results showed that the peak glucose level after the meal was lower in white coffee sessions than black coffee sessions, regardless of coffee types. The difference was the greatest between black and white decaffeinated coffee (mean difference from baseline ± SEM, white coffee: 2.5 ± 0.2 mmol/L; black coffee: 3.3 ± 0.3 mmol/L, $p = 0.019$). The mean glucose iAUC of white coffee sessions was significantly smaller than black coffee sessions for all coffee types except for instant coffee (all $p < 0.05$). The peak insulin levels between black and white coffees were not significantly different, yet white decaffeinated coffee had a 35% smaller mean insulin iAUC than black decaffeinated coffee ($p = 0.025$). The active GLP-1 levels were not significantly different between black and white coffee sessions. These results showed that prior ingestion of coffee with milk and sugar added attenuated the glucose response after the subsequent meal, compared with drinking black coffee beforehand. Our results may provide an explanation for the conflicting literature regarding the protective effects of coffee consumption against type 2 diabetes.

Conflict of Interest
There is no conflict of interest