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Farmers’ and academia’s views”

## Effect of coffee preparation on caffeine content

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### Abstract

Coffee is one of the most important agricultural crops in tropical regions. It is grown to make a beverage, popular all over the world, which has stimulating effects due to its caffeine content. Caffeine is the most widespread psychoactive stimulant in the world and coffee accounts for the highest amount of caffeine consumed worldwide. Besides its positive effects, several negative effects of caffeine on brain development in children, miscarriage and fecundability have been reported. Knowing the contents of their diets is essential especially for vulnerable groups (such as pregnant and lactating women, caffeine-sensitive people). Different methods of coffee preparation have evolved in different parts of the world and information from the scientific literature suggests that the method of preparation has an impact on the caffeine content of the beverage. Therefore, the aim of the research was to evaluate impact of beverage preparation method on caffeine content, while eliminating other variables influencing caffeine extraction. Twelve different brews of *Coffea arabica* from northern Tanzania were analysed using high-performance liquid chromatography with diode array detection at 264 nm. Beans of Bourbon variety, harvested during October – December of 2020, were washed and roasted at 220 to 240 °C for 15 minutes. All analysed samples were prepared using same grind setting and solid to liquid ratio of 6 g coffee to 100 ml of water. The beverages were prepared by immersion (various time and temperature), percolation, pressure methods and microwaved. The content of caffeine in the samples ranged from  $35.2 \pm 0.2$  to  $66.7 \pm 8.6$  mg of caffeine per 100 ml. Statistical analysis was performed using ANOVA single factor. The caffeine content in beverages prepared by immersion methods was significantly higher compared to percolation techniques. Microwaved samples showed no significant change in caffeine content. Obtained values were of compliance with intake recommendations of 200–300 mg day<sup>-1</sup> set by European Food Safety Authority. Caffeine sensitive individuals should consider choosing percolation methods, as they show lower caffeine extraction. Whereas immersion and pressure methods may be more suitable for individuals seeking stimulating properties of caffeine.

**Keywords:** Brewing methods, caffeine, *Coffea arabica*, coffee spp., coffee, HPLC-DAD, human health