

Effect of the degree of roast on the antioxidant properties of coffee

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Coffee roasting is a chemical process which generates or balances aroma, acidity and other flavor components of the coffee. The roasting process may induce the formation of components with antioxidant properties. In this study a method involving the *in vitro* oxidative damage to lipids present in rat liver homogenates was explored to investigate the antioxidant properties of coffee infusions. The coffee samples had increasing degrees of roast and the challenge was to distinguish them regarding the antioxidant potential. We used grains of *Coffea arabica* (Mundo Novo - IAC 388-17). The samples were classified regarding the degree of roasting according to the classification of the Specialty Coffee Association of America (SCAA) and analyzed using the method of the thiobarbituric acid reactive substances (TBARS). Different amounts of samples and incubation times were tested. The IC₅₀ value was defined as the mass of coffee (in micrograms) that inhibits the oxidative damage by 50% in the TBARS assay. The coffee classified as DARK, with the highest degree of roast, exhibited the lower IC₅₀ value when compared with the green, not roasted, coffee (0.74 ± 0.16 versus $2.46 \pm 0.65 \mu\text{g}$, respectively) and therefore the highest antioxidant potential. We intentionally altered the composition of the sample "DARK" and the IC₅₀ changed from 0.74 ± 0.16 to 13.66 ± 3.71 . Therefore the methodology described is suitable not only for distinguishing the antioxidant properties of coffees with different degrees of roast but also for determining coffee purity.

Keywords: Coffee, antioxidant, oxidative stress, free radical.

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