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Original Contribution

Antioxidant activity of blueberry fruit is impaired by association with milk

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Abstract

The antioxidant properties of dietary phenolics are believed to be reduced in vivo because of their affinity for proteins. In this study we assessed the bioavailability of phenolics and the in vivo plasma antioxidant capacity after the consumption of blueberries (*Vaccinium corymbosum* L.) with and without milk. In a crossover design, 11 healthy human volunteers consumed either (a) 200 g of blueberries plus 200 ml of water or (b) 200 g of blueberries plus 200 ml of whole milk. Venous samples were collected at baseline and at 1, 2, and 5 h postconsumption. Ingestion of blueberries increased plasma levels of reducing and chain-breaking potential (+ 6.1%, $p < 0.001$; + 11.1%, $p < 0.05$) and enhanced plasma concentrations of caffeic and ferulic acid. When blueberries and milk were ingested there was no increase in plasma antioxidant capacity. There was a reduction in the peak plasma concentrations of caffeic and ferulic acid (− 49.7%, $p < 0.001$, and − 19.8%, $p < 0.05$, respectively) as well as the overall absorption (AUC) of caffeic acid ($p < 0.001$). The ingestion of blueberries in association with milk, thus, impairs the in vivo antioxidant properties of blueberries and reduces the absorption of caffeic acid.

Keywords: Blueberry; Milk; Antioxidant capacity; Caffeic acid; Bioavailability; Proteins; Free radicals

Abbreviations: AUC, area under the curve; FRAP, ferric reducing antioxidant potential; TAC, total antioxidant capacity; TRAP, total radical-trapping antioxidant parameter

Article Outline

Materials and methods

- [Chemicals and reagents](#)
- [Food matrices](#)
- [Sample phenolic extraction](#)
- [Analysis of blueberry phenolics](#)
- [Total antioxidant capacity \(TAC\) assays](#)
- [In vitro study on milk addition to blueberry extracts](#)
- [In vivo study design](#)
- [Biochemical analyses](#)
- [Determination of phenolic acids in plasma samples](#)
- [Statistics](#)

Results

- [Phenolic composition and in vitro TAC of blueberry](#)
- [In vitro study on food association](#)
- [Effects of blueberry ingestion on markers of plasma antioxidant status and lipid metabolism](#)
- [In vivo effects of milk addition on markers of plasma antioxidant status and lipid metabolism](#)

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