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The development of iron fortified tea

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Iron deficiency is the most widespread nutritional disorder but may be combated through fortification of commonly consumed centrally processed food. Tea is an ideal candidate because, aside from water, it is the most consumed beverage globally. Fortification may be achieved at low cost by adhering iron to the tea leaves during processing, such that the iron will detach when the tea is brewed. However, the phenolic compounds in tea contain ortho-dihydroxyl groups (gallol and catechol moieties) which complex iron. These complexes are not bioavailable and are highly colored. This iron-polyphenol reaction is known to be pH dependent such that it does not occur, or even reverses, at pH 1. Therefore the pH levels of concern are that of brewed tea (~pH 5) and that of the small intestine (~pH 7) where the iron and polyphenols are absorbed into the body. A method for the quantification of iron-polyphenol complex formation was developed such that spectrophotometry may be used with gallic acid to generate calibration curves. This was used to compare the formation of iron complexes with gallic acid and black tea polyphenols with different iron sources and stabilizers. Reducing agents were one class of stabilizers studied. Of these, sodium ascorbate and sodium metabisulfite hindered iron complex formation at pH 5 but not at pH 7. Other stabilizers are currently being investigated.

Biography

Elisa June Teresa McGee is expecting her PhD degree in 2016 at the University of Toronto. Her passion for food technology was refined while studying chemical engineering and applied chemistry. She was awarded with large scholarships/fellowships for each year of graduate school and has won a Canadian Institute of Food Science & Technology Toronto Section Scholarship and a Best Contributions Award at the International Conference on Bioencapsulation for her work in food fortification.

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