

Effect of Processing Methods on Heavy Metal Concentrations in Commonly Consumed Green Leafy Vegetables Available in Sri Lankan Market

T.C. Kananke², J. Wansapala¹ and A. Gunaratne³

¹Department of Food Science and Technology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Gangodawila, Nugegoda, Sri Lanka

²Department of Food Science and Technology, Faculty of Applied Sciences,

³Department of Livestock Production, Faculty of Agriculture, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka

Abstract: Green leafy vegetables are considered as a good source of nutrients (vitamins, minerals, fibers and phytochemicals), particularly among urban populations dependant on plant based diets. Recently, several research studies conducted in and around Colombo District, Sri Lanka, have reported increased trace element concentrations in green leafy vegetables collected from production and market sites. Therefore, the present study was conducted with the aim of studying the effect of three food processing techniques in reducing the toxic elements present in green leafy vegetables commonly consumed in Sri Lanka. Five types of green leafy vegetables ["Mukunuwenna" (*Alternanthera sessilis*), "Thampala" (*Amaranthus viridis*), "Nivithi" (*Basella alba*), "Kohila Leaves" (*Lasia spinosa*) and "Kankun" (*Ipomoea aquatica*)] were randomly collected from ten different markets sites located in and around Colombo District, Sri Lanka. Each type of green leafy vegetable sample was subjected to three processing treatments (raw, cooked and stir-fried) and analyzed for five trace elements (Ni, Cd, Cr, Pb and Cu), using the Atomic Absorption Spectrophotometry. The average concentrations (mg kg⁻¹, dry weight basis) of metals detected in raw, cooked and stir-fried green leafy vegetable samples were as follows: Ni (2.93±2.88, 2.28±1.44, 2.05±1.31), Cd (0.30±0.25, 0.20±0.19, 0.20±0.18), Cr (2.45±1.78, 2.34±1.62, 2.24±1.64), Pb (0.59±0.42, 0.48±0.39, 0.44±0.38) and Cu (11.30±4.21, 9.73±3.69, 9.23±4.48). The results showed no significant differences in heavy metal contents among three processing methods (p<0.05). Therefore, the type of processing method has a minimal effect in reducing the heavy metal contents of green leafy vegetables.

Key words: Heavy metals, green leafy vegetables, raw, cooked, stir-fried