

Root Cause Analysis of High Microbial Count in Moringa (*Moringa Oleifera*) Powder and Developing a Method to Enhance Its Microbial Quality for the Export Market

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Sri Lanka produces a range of superfoods using Moringa which is highly susceptible to microbial contamination. The objectives of this study were to investigate the root causes for the high microbial contamination in Moringa powder and to develop a method to enhance microbiological quality to meet export standards. Initially root cause analysis was performed using cause and effect diagram. Three sets of water samples from the direct pipeline and the temporary storage tank, and three sets of leaf samples from each processing were randomly collected and subjected to total plate count (TPC), coliform and yeast and molds analyzes. The maximum sodium hypochlorite (NaOCl) concentration used for the washing process in an organic Moringa production was calculated by measuring the residual chlorine content using the sodium thiosulfate titration method. Various methods were developed by adding NaOCl washing process to eliminate the identified root causes and then a series of samples were prepared. Three sets of Moringa powder from each developed methods have been used to analyze the antioxidant activity with Folin-Ciocalteu assay and measured the physicochemical properties. The results were compared with already prepared dried gamma treated Moringa powder. Accordingly, fresh Moringa leaves contain high initial coliform, yeast & mold and TPC as 181×10^4 CFU/ml, 41×10^4 CFU/ml and 250×10^5 CFU/ml, respectively. The major root causes were poor hygienic practices, lack of inspection and improper manufacturing practices. It was concluded that the new method; washing up fresh leaves with 50 ppm sodium hypochlorite, sun drying until the moisture level of fresh leaves in the farm drops to 40%, steam blanching at the processing plant, Oven drying of Moringa leaves until the moisture level is reduced to 10%, grinding and further drying of powder at 55 °C for 30 minutes, has enhanced the microbial quality to the desired levels, while retaining maximum physicochemical properties such as ash, fat, protein, fiber values as 4.73 ± 0.02 g, 3.01 ± 0.26 g, 20.80 ± 0.72 g, 16.86 ± 0.07 g respectively thus making the powder suitable for the export market.

Key words: Antioxidant, Export market, Microbial count, Moringa powder