Development and Quality Evaluation of Instant Green Smoothie Powder

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Abstract

Fruits and vegetables are rich in more nutrients and phytochemicals that can be given enormous healthy and nutritional benefits. The world health organization recommends to consume ≥ 5 portions of fruits and vegetables per day. But, only 17.5% of Sri Lankan adults consume suggested value. Therefore, the production of a healthy and convenient product may increase the consumption of fruits and vegetables. The aim of this study was to develop an instant green smoothie powder as a more convenient product using locally available fruits and green leafy vegetables and to evaluate the quality parameters of the powder. Four fruits and three green leafy vegetables were selected to develop fresh green smoothie. The best formulation of the green smoothie was selected by conducting a sensory evaluation using 30 semi-trained panelists. The selected formulation was freeze-dried to obtain instant green smoothie powder. The resulted powder was analyzed for proximate composition; protein (2.67 ± 0.02%), fat (1.96 ± 0.01%), moisture (4.82 ± 0.01%), ash (1.22 ± 0.02%), and fiber (28.57 ± 0.01%) using AOAC 2000 method. Reconstituted green smoothie showed physicochemical properties such as pH of 4.21 ± 0.04, titratable acidity of 0.213 ± 0.04 g/100ml, total soluble solid of 12.330 ± 0.01%), and water activity of 0.17 ± 0.01. The powder properties revealed that the powder has very good (based on Carr Index) flow ability (6.665 ± 2.35) and it has low (based on Hausner ratio) cohesiveness (1.0713 ± 0.03). The solubility (94.71 ± 2.43) of the powder complied with the SLS Standards (668: 1984). The instant green smoothie contained 129.5 ppm of vitamin C content and 107.25 ± 3.32 Ascorbic Acid Equivalent mg/g of total antioxidant capacity. The powder was microbiologically stable (only 1log CFU/mL of total plate counts). The water activity of the powder was significantly (p<0.05) increased, but the pH and total plate count were not significantly (p>0.05) increased during the five weeks of storage at room temperature in vacuum package. This instant powder can be introduced as the more convenient and healthy choice for the consumers, which has higher crude fiber content, better microbiological stability and very good powder properties.

Key words: Green smoothie, Instant powder, Fruits, Green leafy vegetables

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