

Comparative analysis of vitamin C, dietary fiber and selected mineral content of fresh and commercially available fruit juices

W. A. A. D. Jayathilake¹, A. A. P. Keerthi¹, S. Ekanayake^{2*}

¹College of Chemical Sciences, Institute of Chemistry Ceylon, Rajagiriya 10107, Sri Lanka

²Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka

* sagarikae@hotmail.com

Vitamin C (ascorbic acid), dietary fiber, and minerals such as potassium and sodium are important nutritional components of fruit juices. However, their levels vary between fresh and commercially processed juices due to dilution, fortification, pasteurization, and storage. This study compared moisture content, vitamin C, dietary fiber, and selected minerals in freshly prepared and commercially available fruit juices to evaluate the variations. Vitamin C was determined using iodometric titration, dietary fiber by enzymatic-gravimetric analysis, moisture by oven drying, and potassium and sodium by Atomic Absorption Spectroscopy (AAS). Moisture content was highest in fresh watermelon (92.13%) and papaya (92.73%), while commercial mango and orange nectars showed lower values (82–83%) due to added solids and concentration. Fresh orange juice had the highest vitamin C content (35.03 mg/100 mL), whereas fresh watermelon had the lowest (4.07 mg/100 mL). Commercial nectars generally exhibited higher vitamin C levels than absolute juices as a result of fortification. Dietary fiber content was highest in fresh orange juice (0.84% w/w) but was substantially reduced in clarified commercial juices (< 0.3% w/w). In contrast, mango nectars retained higher fiber content (2.65% w/w) due to pulp retention and stabilizers. Potassium was the predominant mineral, ranging from 4.99 mg/g in commercial mango juice to 51.36 mg/g in commercial orange juice. Sodium levels

were negligible in fresh juices (<0.19 mg/100 mL) but increased in commercial products, reaching 32.50 mg/g in commercial orange juice and 12.96 mg/g in commercial mango juice. Among fresh fruits, passion fruit contained the highest potassium level (10.44 ± 0.01 mg/g), while watermelon had the lowest (2.46 ± 0.01 mg/g). Red apple showed the highest sodium content (6.71 ± 0.01 mg/g). Overall, the study demonstrates that commercial processing significantly alters the nutritional profile of fruit juices, highlighting the superior nutritional quality of free juices and the need for consumer awareness and appropriate regulation.

Keywords:

vitamin C, dietary fiber, potassium, sodium, fruit juice, processing

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