COMPARISON OF FUNCTIONAL PROPERTIES OF STARCHES AVAILABLE IN SRI LANKA

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ABSTRACT

Starch contributes 50 to 70% of energy in the human diet, providing a direct source of glucose, and glycemic response to excessive consumption of starch may be a factor in some diet-related illnesses. Rice is the principal staple food in Sri Lankan diet and other carbohydrates rich flour types also consumed in a considerable quantity. Higher consumption of white rice may increase the prevalence of diabetes in Sri Lanka. The objective of this study is to compare the functional properties of 16 available starches in Sri Lanka by observing the granular structure, determining Water Solubility Index (WSI), Water Absorption Index (WAI), and Water Swelling Capacity (WSC). Particle size 100-150 μm dry powder obtained for analysis. The hydrolyzing rate was determined by GOD method. The granule morphology was determined using Scanning Electron Microscopy (SEM). Elemental CHN composition was analyzed using CHN Analyzer and WSI, WAI and WSI was determined according to method described in Noor et al, 2014. Hydrolyzing rates of the starches for amyloglucosidase and α-amylase ranged from 4.78±3.04 - 85.69±8.18 μM glucose/min and 2.10±1.25 - 174.37±9.96 μM maltose/min respectively. The highest glucose and maltose releasing rates were observed respectively in Oats and Palmyra while the least rate was observed in Soy on both occasions. The average granule size of the starches ranged from 12.22 - 1457.20 μm^2. Largest granule sizes were found in Mandu, Kithul, Chickpea and Oats while White Basmati, White Raw Rice and Red Basmati had markedly smaller granule sizes. The highest Average WAI showed Undu and while Wheat showed least average WAI and ranged from 0.8±0.02 – 2.73±0.11. Highest WSI was recorded in Soy while Olu recorded least WSI. Kithul demonstrated highest WSC while Soy Demonstrated least WSC ranged from 11.31±0.1 – 2.4±0.03