Nutrients Content Of Food Wastes From Different Sources And Its Pre-Treatment

G. K. Chua1, a) , F. H. Y. Tan1, b), F. N. Chew1, c) and A. R. Mohd-Hairul2, d)

1 Faculty of Chemical and Natural Resources Engineering, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Kuantan, Malaysia.

2 Faculty of Industrial Sciences and Technology, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Kuantan, Malaysia

chua@ump.edu.my feliciathy1232@gmail.com cfne@ump.edu.my mhairul@ump.edu.my

Abstract.
Food wastes are the most abundant waste available in Malaysia. It is normally disposed of together with the municipal solid waste in a sanitary or non-sanitary landfill and incinerated without any recycle efforts. Based on current households' number of 7.67 million and a food waste generation rate of 0.54 kg/day per household [1], the amount of food waste generated is about 1.51 million tons/year. Besides recovering the energy from these food wastes through anaerobic digestion, composting, pyrolysis and hydrothermal carbonization [2], the high nutrient content of food wastes can also be used as a fermentation substrate to produce value-added product. However, the composition of daily collected food waste is varied and may affect the fermentation performance and product quality. Hence, this study aims to examine the extent of variation in the nutrients content of food wastes collected from different sources and also to evaluate the effect of hydrothermal pre-treatment on the nutrients composition of food wastes. Food wastes were collected randomly from the university's café, Indian and Chinese restaurants, morning and night markets, and also from a household. It was then sorted, weighed, crushed and blended before further characterization. Food wastes from university's café was then hydrothermal pre-treated at 120☐C for 75 min at a food waste to water ratio of 1:2. Total solid and volatile solid contents and moisture content of various untreated and pre-treated food wastes were analyzed by Standard Method, while composition of lipid was determined by Bligh & Dyer method. Protein and carbohydrate contents were determined by Bradford method and Phenol-sulphuric Acid method, respectively. Results from analysis showed huge variation between food wastes from different sources, which may due to the difference in nature of the sources. After hydrothermal pre-treatment, the total solid and volatile solid contents were lower (32% and 24%, respectively) if compare to the untreated food waste. No change of lipid content was found, but the protein and carbohydrate contents in the pre-treated hydrolysate have increased 107% and 152%, respectively. The results showed that the hydrothermal pre-treated food waste can be used either as a feed medium or a supplemental medium for fermentation process. Nevertheless, further investigation for controlling the composition in food wastes is needed if a consistent nutrient contents are required.