

Physicochemical, functional properties, in vitro starch digestibility and estimated glycaemic index of composite flour influenced by resistant starch

ABSTRACT

There has been increasing demand for resistant starch-enriched food products with a low glycaemic index (GI) as consumers nowadays are aware to improve health status. Therefore, the present study was carried out to investigate the effect of different substitution levels of type-2 resistant starch (high-amylose maize starch) (HM) into wheat flour. In this study, wheat flour sample (control) and six test composite flour samples comprising wheat flour substituted with 5%, 10%, 15%, 20%, 25% and 30% of HM powder were analyzed to compare their physicochemical characteristics, functional properties, in vitro starch digestibility and expected glycaemic index (eGI). The results revealed that the incorporation of HM had resulted in increased moisture (12.70 – 13.31%) and total dietary fibre (TDF) (0.19 – 0.46%), as well as a decreased proportion of ash, fat, and protein. The carbohydrate and energy values were not significantly different upon the increasing percentage of HM ($p>0.05$). Mineral analysis showed that HM composite flour had significantly lower Mg, Ca, K, P, Fe, Zn and Se than the control. HM composite flour exhibited greater water holding, water holding capacity, oil holding capacity and swelling power than the control sample. The hydrolysis index and eGI of HM composite flour decreased with higher HM substitution. In conclusion, HM composite flours showed a good potential to be used in functional food, where positive impacts have been observed for in vitro starch digestibility and eGI characteristic.