



962/E2

Rice flour fortification with iron and the acceptability of the traditional food products made from fortified flour

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Iron deficiency anaemia is the most prevalent nutritional deficiency in Sri Lanka. The recent nutritional surveys highlighted that significant differences exist in the prevalence of anaemia in relation to geographical areas and socio-economical groups. A high proportion of anaemia was reported in the children at the age of 6-59 months (25.2%) and women, pregnant, non-pregnant, and lactating (8.3%, 33.6% and 30.2% respectively) in the estate sector. The Government needs to increase and popularize the consumption of iron fortified rice flour among the estate population, who suffer from a high rate of anaemia. The aim of the present study is to fortify rice flour, as per WHO recommendations (*i.e.*, 40 ppm of iron as a source of sodium iron EDTA and 2.6 ppm of folic acid) and to evaluate overall consumer acceptability of commonly consumed Sri Lankan traditional rice flour-based food products such as roti, string hoppers and hoppers. Mixing of mineral and vitamin premix was carried out on a pilot scale in 50 kg batch sizes, using a pilot model Gardner Ribbon blender, and physico-chemical properties of the fortified flour, iron content, and sensory evaluation of products were investigated. Results were shown that the mixing time for homogenous distribution of fortificant could be achieved after blending in a Ribbon blender for 15 min. A significantly high iron content ($p \leq 0.05$) among the products formulated from unfortified flour was obtained in roti (28.6 ppm, db) due to the addition of scraped coconut (~50%) while from fortified flour was obtained in string hoppers (63.3 ppm, db). With regard to the percent iron losses during processing of products, roti had shown a significant higher value (34.2%, on db) than string hoppers and hoppers (-3.8% and 4.3%, on db) from the original fortified flour at 40 ppm level. Roti, string hoppers and hoppers prepared from fortified flour were accepted by the screened sensory panel and processing with fortified flour has not imparted any significant ($p \leq 0.05$) organoleptic changes on products. Therefore the fortification of iron into rice flour at level of 40 ppm can be recommended for formulation of products.

Key words: Iron deficiency, iron fortification, rice flour, anaemia

Acknowledgement: Financial assistance by Ministry of Health.

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