



208/B

Development of supplementary food formula rich in iron using locally available raw materials

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Iron deficiency is the most prevalent micronutrient deficiency in the world today, and it is the commonest cause of nutritional anaemia. Iron deficiency is one of the major malnutrition problems in Sri Lanka as well. Hence, the present study was carried out with the main objective of developing a supplementary food formula rich in iron from locally available raw material.

A preliminary study carried out to identify the most suitable raw materials for the product revealed that rice, green gram, black gram and cowpea were suitable. They were selected as locally available nutrient dense cereals and pulses and *Centella asiatica* was selected as a locally available iron rich source. A market survey was carried out to identify the consumer preference on consumption of pulses, *Centella* leaves and consumer awareness on iron deficiency and iron containing foods available in the market. The consumer preference for a supplementary powder rich in iron was evaluated as well.

Three flour blends were developed by mixing flour samples considering the caloric value, iron content and sensory attributes. The most consumer preferred sample was selected by conducting a sensory evaluation. With the assistance of thirty untrained sensory panelists the developed supplementary powder with most consumer preference had the composition of rice flour 55%, black gram flour 20%, green gram flour 10%, cowpea flour 10% and *Centella* leaves flour 5%. Related nutrient analyses were carried out based on standard AOAC and SLS procedures. Mineral content was analyzed using the Atomic Absorption Spectrometry method. A modified version of *in vitro* digestion method was used to measure the bioavailability of iron. Composition analysis revealed that supplementary food formula had 2.36% moisture, 3.04% ash, 1.86% fat, 4.9% fibre, 11.92% protein and 75.65% carbohydrate. The caloric value of the product was 367.02 kcal/100 g. The iron content of the sample was 7.38 mg/100 g and iron bioavailability was 40.9%. The shelf life analysis carried out revealed that the product packed in triple laminated aluminum foil package was safe to consume for 8 weeks under room temperature storage.

Keywords: Iron, supplementary food, iron deficiency, iron bioavailability