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Iron content and *in-vitro* availability of iron in some popularly consumed legumes in Sri Lanka: A preliminary study

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Iron Deficiency Anemia (IDA) is still one of the major public health challenges in a global scale with an estimated 3.5 million people in the developing world. A Survey by the Medical Research Institute (2012) reported that 25.2% children, 16.7% pregnant women, 20.5% lactating women and 22.2% non-pregnant women in Sri Lanka were anemic despite all preventive measures. Since rice is low in iron content and low in iron bio-availability, the present study was directed at studying legumes. Legume is a fruit or seed of a plant in the family *fabaceae*.It is a good source of non-heme iron and dietary protein. Therefore dietary iron requirement could be well satisfied with the intake of legumes.

Some legume varieties (soya bean: PB-01,green beans: MI-05 and MI-06, kidney beans: Waruni, Bombay and Dhavala) obtained from the Grain Legume and Oil Crop Research & Development Center, at Angunakolapelessa and market samples of chickpea, lentils and horse grams were used in this study. Iron content was determined by dry ashing followed by spectrophotometry (AOAC, 2000). *In-vitro* availability of iron was determined by extracting soluble iron in food with 6M HCl (at pH 2, 37 ^{0}C) and treating with the enzyme pepsin (simulated gastric condition).The proximate composition analysis of legumes with high iron was carried out according to the AOAC 2000 method. The mean total iron content ± SD values (mg/100g on dry weight basis) of the studied legumes were PB-01: 8.66 ± 0.47, MI-05: 7.3 ± 0.22, MI-06: 3.3 ± 0.1, Waruni: 5.7 ± 0.1, Bombay: 2.97 ± 0.6, Dhavala: 3.81 ± 0.1, chickpea: 5.34 ± 0.32, lentils: 5.24 ± 0.7, horse gram: 7.14 ± 0.16. According to these results, soy beans (PB-01), green beans (MI-05) and horse gram had high iron contents. The *in vitro* iron availability values (w/w %) of the above high iron containing legumes were, PB-01: 63.5 ± 0.23%, MI-05: 27.3 ± 0.32%, horse gram: 62.3 ± 0.94% respectively. Results indicated that around 30-65% of total iron present in legume is soluble as ionic form where the other portion may be present as insoluble bound form with soya beans having the highest availability for absorption to human body. The high iron containing legumes: soya beans, green beans and horse grams had high fiber and high protein contents of 6.47 ± 0.19%), 39.2 ± 0.3%, 4.61 ± 0.15%, 32.6 ± 0.65%, 4.83 ± 0.31%, 23.8 ± 0.38% on dry weight basis, respectively. The present study concluded that soy bean is a better source for dietary iron, protein and fiber requirement in human compared to other studied varieties.

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