

The Role of Natural Iron Chelators Incorporated to the Diet on Control of the Dietary Iron Contribution on Iron Overload through *in Vitro* Analysis

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There are many natural iron chelators found in food sources. The natural chelators can either increase or decrease the bio-availability of iron. The present study was carried out to assess the potential of incorporating food sources rich in natural iron chelators into the diets to reduce the dietary iron contribution for iron overload under *in vitro* conditions. The iron overload is the major cause of death in conditions such as thalassemia. Fifteen diet plans were formulated based on four ingredients namely, red rice, fresh milk, turmeric and black tea against a control diet. The designed diets were subjected to stimulated digestion and their effect on bio-availability of iron was tested using the Atomic Absorption Spectrometric method. The results showed that the bio-availability of the iron had comparatively reduced in all the diet plans except in one diet plan but that increase was not statistically significant ($p>0.05$). The diet containing combinations of turmeric, black tea and fresh milk showed the highest decrease (69.69%) in the iron bio-availability compared to the control. The results indicated that in the presence of lactoferrin in fresh milk, polyphenols in turmeric and black tea reduced the iron bioavailability in higher extent than when present alone as lactoferrin has a protective effect towards the polyphenols. As the incorporation of natural iron chelators significantly reduced the *in vitro* iron bioavailability in the diets ($p<0.05$), it can be concluded that contribution of dietary iron towards the iron overload condition can be controlled by incorporating natural iron chelators to the diet.

Keywords: Iron bioavailability, Iron overload, Natural chelators, Stimulating gastro intestinal conditions