Thesis Title Iron Absorption from Vegetarian Diets

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ABSTRACT

The bioavailability of a number of minerals may be altered by the special characteristics of vegetarian diets. Iron deficiency anaemia is one of the common micronutrient problems associated with unplanned vegetarian diets. In the present study, the absorption of nonheme iron was measured from vegetarian meals containing considerable amounts of iron-binding phenolic compounds and phytate. The extrinsic tag method was used to label the nonheme iron. The percentage absorption is a measure of the availability and all absorption figures were related to the absorption of a 3-mg reference dose, a level corresponding to absorption in subjects who are borderline iron-deficient. There was a slight difference in iron bioavailability between the two meals (4.1% and 3.5%) due to differences in their dietary contents. It was apparent that vegetarian meals had low initial iron absorption, however, the iron absorption of both meals progressively increased with increase in the level of ascorbic acid, 2-3 times with 100 mg and 4-5 times with 200 mg of ascorbic acid respectively. Considering the limited caloric intakes and the content of iron in the meals, as revealed from food sample analysis, the amount of iron absorbed per unit energy was not

able to meet certain requirements of important target groups, ie. children, adolescents and menstruating women. An in vitro method for the determination of availability of nonheme iron from foods was also investigated. The percent ionizable iron was shown to correlate highly with the percent iron absorption from the same meal. Based on these observations, it is proposed that ionizable iron as described in this study can be used as a reliable measure of bioavailability of nonheme iron in foods. In summary, vegetarian diets can assure nutrient adequacy and promote health when they are well planned and chosen in line with scientific nutrition principles. Vegetarians can avoid the status of a negative iron balance by limiting fibre, phytate and iron binding phenolic compounds to a reasonable degree, avoiding excessive use of soy products, maintaining an adequate energy intake, and eating a wide variety of ascorbic acid-rich food. Particular attention needs to be given to vegetarian groups with high risks of negative iron balances, ie. infants, children, adolescents and adult menstruting women.