DOUBLE ISOTOPE STUDIES ON THE
ABSORPTION OF IRON FROM
SELECTED FOODS IN
ANEMIC BLOOD
DONORS

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AN ABSTRACT OF THE THESIS OF
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The thesis is concerned with the absorption of iron from selected foods in anemic blood donors.

The studies reported in this thesis were undertaken in an attempt to determine the optimum conditions for the absorption of iron from various foodstuffs. Over 200栊g subjects were employed in each of the iron in selected foodstuffs studies. Foodstuffs were studied: wheat, chickpeas, broad beans and okra. These were labeled with Fe^{55} by injecting a solution of the isotope into the stems of growing plants. Each labeled foodstuff was prepared in a food form commonly consumed in the Middle East. Whole wheat Arabic bread was prepared from the labeled wheat, the chickpeas and broad beans were prepared in the form of Falafel (small patties fried in oil) and the dried okra was mixed with tomato juice. Nine to ten iron deficient subjects were employed for each foodstuff studied. Each subject received a prepared Fe^{55}-labeled foodstuff dose supplying between 1.9 to 3.1 mg iron on the first day and a standard Fe^{59}-labeled ferrous ascorbate dose on the second day of the experimental period. The radioactivity retained in the blood from the two isotopes after ten days was measured. The absolute and relative absorption values were calculated.

The results indicated that okra with tomato juice was the best iron source, whole wheat Arabic bread the poorest while chickpeas and broad beans intermediate. The absorption values were 15% for the wheat iron, 27% for broad bean, 36% for chickpeas and 43% for okra. The absorption of ferrous ascorbate iron was higher than that of foodstuff iron. Thus, the absorption of foodstuff iron as a percentage of the absorption of the ferrous ascorbate iron did not change their relative order as sources of dietary iron. The relative absorption of the foodstuffs ranged from 15% for wheat to 66% for okra.

The absorption of ascorbate iron showed the highest correlation with the serum transferrin saturation percent \( (r = 0.30; P < 0.10) \) whereas the absorption of foodstuff iron correlated best with the packed cell volume of the blood \( (r = 0.31; P < 0.10) \).
The results of these studies indicated that the absorption values obtained under the conditions of the experiments, where only a small amount of a single foodstuff was administered, were too high to account for the occurrence of iron deficiency at the level of iron intake found in the Middle East. It is recommended that iron availability from practical meals be investigated.