

## Dietary Iron Intakes By Selected Population of Mandi District, Himachal Pradesh

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**ABSTRACT** Iron intakes of different age groups, mainly children, adolescents, adults and aged people of urban and rural areas of Mandi district of Himachal Pradesh were studied. The iron intake of adult males and aged people was slightly greater (36.00 mg/d) when compared with females (35.00 mg/d) of the same age groups. The mean iron intake of adolescents was almost the same both in males and females as 34.60 mg/d in rural families and 37.70 mg/d in urban families. The mean iron intake of children varied from 14.91 to 15.88 mg/d. No significant difference was observed between the mean iron intake of rural and urban population of different age groups.

### INTRODUCTION

Iron is an important constituent of blood. It is a component of complex certain haemoglobin, which is a structure base of red blood cells (RBC). Haemoglobin takes part in the transportation of oxygen from the lungs to the tissues. In case of haemoglobin deficiency oxygen carrying capacity of the blood is reduced. Anaemia, a condition where haemoglobin level is low, may result due to deficiency of iron in the diet. Vulnerable groups (women and children) are more affected by anaemia. World Health Organisation (1989) reported that 37 per cent school age children, 35 per cent non-pregnant women and 18 per cent adult males suffer from anaemia.

Since no information was available on the food consumption pattern and dietary iron intake by people of the region under study so the present investigation was undertaken.

### MATERIAL AND METHODS

The study was conducted in urban and rural

areas of Mandi district of Himachal Pradesh. The representative sample of the urban area selected was from Sadar Mandi and for the rural areas namely Gohar, Chailchowk and Bhangrotu. Two hundred subjects were selected (117 males and 83 females). A pre-tested questionnaire was used to collect the general information, the information regarding food habits, food consumption pattern etc. The uncooked and cooked samples of cereals, pulses, vegetables and non-vegetarian foods etc. consumed by the selected families were collected and analysed for iron content. The per cent loss in iron content during cooking was also calculated.

### RESULTS AND DISCUSSION

*Family Size* : The family size ranged from one number to more than five members in the family. A maximum of 76 (38.0 %) families had 3 to 5 family members. Seventy three families (36.5 %) had more than five members, with only 51 families having 1 to 3 members, showing that even now there is a trend of joint families both in rural and urban areas. In the rural areas most of the families had 3-5 members, whereas, in the urban areas, most of the families had more than five members. This may be due to the reason that the rural youth had moved towards the cities in search of jobs etc.

*Age of the Subjects* : Males and females of the rural and urban families were divided into different groups *i.e.* children, adolescents, adults and aged. In total were 7 children, 69 adolescents, 85 adults and 39 aged people of both sexes

**Food Habits :** As far as the food habits of the subjects were concerned, 90 were vegetarian and 110 were non-vegetarian. In rural areas percentage of non-vegetarians was high as compared to urban population. This could be due to the reason that rural people kept their own animals which could be used as a source of meat and had their own poultry whereas the urban population had to purchase from the market and being an expensive food item was consumed in lesser amounts.

**Iron Content in Different Foodstuffs :** The iron content in different foodstuffs was determined and is presented in table 1. The iron content of the cereals ranged from 1.14 to 5.53 mg/100 g, the maximum being found in wheat (5.53 mg/100g), and minimum in rice (1.14 mg/100 g). The results of the present study are similar to that reported by Srikumar (1993) but contrary to those reported by Kaur (1986) that rice contained the highest amount of iron *i.e.* 5.13 to 7.7 mg/100 g. This may be due to the soil, climatic conditions and varietal differences. There was approximately 8-30 per cent

reported by Qureshi et al. (1991). But contrary to this, Lyncy et al. (1984) revealed that soya-bean, lentil and split peas contained low levels of iron. It appears that cereals and pulses are fairly good sources of iron. Similar reports were given by Kumar and Kapoor (1984). Iron content of the cooked pulses were less than that of the uncooked ones. This may be due to cooking and processing methods. The results of the present study are in close agreement with Rao and Deosthale (1985) who reported that overnight soaking of greengram and blackgram resulted in 20 to 40 per cent loss of iron.

Among the vegetables carrot contained higher amounts of iron (1.17 to 1.22 mg/100 gm), whereas brinjal contained the minimum (0.55 to 0.61 mg/100 g) indicating that the vegetables analysed contained lesser amounts of iron as compared to cereals and pulses. These findings are in line with those reported by Srikumar (1993).

Milk and milk products contained very small amounts of iron, *i.e.* 0.10 to 0.15 mg/100 ml. The present results differed from that given by Singh et al. (1980) reporting the iron content of milk as 1.80 to 3.18 mg/l. The variation may be due to the difference in the breeds of the animals and the type of fodder given to them. Chicken contained the maximum amount of iron, *i.e.* 6.18 mg/100 g, followed by mutton and egg as 5.58 and 2.35 mg/100 g, respectively. As is evident from the table 1. Cooking resulted in loss of iron content of different foods analysed.

Jaggery was found to be a better source of iron (2.50 mg iron per 100 g) as compared to that of refined sugar. The result was in conformity with the reports of NIN (ICMR, 1990) showing a better source of trace elements when compared with refined sugars. No iron was detected in drinking water samples.

**Iron Intake :** The mean iron intake of children ranged from 14.91 - 15.88 mg/d (Table 2) which was significantly lower than the Recommended dietary allowances (RDA). This

**Table 1: Iron content of different food stuffs (mg/100 g)**

Food stuffs	Uncooked	Cooked	Per cent loss
<i>Cereals</i>			
Rice	1.14	0.99	13.15
Wheat	5.53	3.83	30.74
Maize	2.86	2.64	7.69
<i>Pulses</i>			
Rajmash	6.10	5.98	1.95
Mash	4.57	4.19	8.31
Lentil	6.87	6.51	5.24
<i>Vegetables</i>			
Cabbage	0.83	0.78	6.02
Carrot	1.77	1.22	31.07
Brinjal	0.61	0.55	9.83
<i>Non-Veg. Foods</i>			
Chicken	6.18	6.13	0.80
Mutton	5.58	5.39	3.40
Egg	2.35	2.06	12.34

loss of iron content of cereals during cooking.

Iron content of the pulses varied from 4.57 to 6.87 mg/100g. Lentil contained the highest amount of iron. Similar observations were re-



may be due to the reason that overall food intake of children was less.

Table 2: Mean iron intake by different age groups (mg/d)

Age group	Rural		Urban	
	Male	Female	Male	Female
Children	15.30	14.91	15.38	15.88
Adolescents	34.60	34.60	37.70	37.00
Adults	36.00	34.96	34.97	34.83
Aged people	36.00	35.00	36.00	35.01

The iron intake was greater in the urban children as they consumed greater amounts of cereals, pulses, sugar and jaggery when compared with the intake of rural children. Similar observations were reported by Trazebska et al. (1984).

Daily iron intake of the adolescents was found to be just sufficient ranging from 34.60 to 37.70 mg/d. The intake was greater in urban adolescents as compared to that of the rural adolescents. The diets of the urban adolescents comprised more of cereals and pulses, both being good sources of iron, and led to more of iron intake. Daily iron intake of rural female adolescents was 34.50 mg/d which was less than the intake of the urban population (37 mg/d). The results of the present study are in agreement with Pushpamma et al. (1982) who reported that mean iron intake by boys was just sufficient.

Daily intake of iron by adults was found to be above RDA and varied from 34.83 to 36.00 mg/d, being the highest in rural males (36.00 mg/d).

As depicted in table 2 the iron intake of rural males was more than that of urban males which may be due to greater intake of cereals. Average consumption of iron in aged population was 35 to 36 mg/d which was in accordance with RDA. No significant difference was observed in the intake of rural and urban

population. McClean and Rees (1977) observed poor intake of iron (13.1 mg/d) in elderly people.

It can be concluded that mean iron intake of all the age groups of the selected subjects was observed to be less as compared to RDA. Nutrition education with special emphasis on importance and need for iron, supplementation of iron rich foods to improve the iron status, should be provided.

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