

CHAPTER-V

SUMMARY AND CONCLUSION

The present investigation was conducted with two major objectives. The first was to study the F' contents of raw foods and potable water of a fluorotic village of Haryana. The second aspect of the study included the estimation of total F' intake of the people and their urinary F' excretion. Special emphasis was on the assessment of the seasonal differences in the underground potable water F' levels, peoples fluoride intake and urinary excretion. For the purpose of this study the village selected was Gangwa, about 6 KM away from Hisar town. A preliminary survey of the potable water sources viz., municipal water, wells and handpumps was made. The water from all these sources being used for drinking and cooking purpose by the people were collected during three seasons and the depth of the sources noted by enquiries from the villagers, Sarpanch etc. On the basis of presence or absence of dental mottling a sample of 50 fluorotic and 50 non-fluorotic adults with equal number of male and female subjects were selected. Adequate representation of people the drinking water from all sources was ensured. Therefore, the selected respondents represented all 8 groups of people using potable water from 8 sources (7 ground water samples, 1 municipal). Except the raw foods all the other observations were made for all the three seasons i.e. summer, monsoon and winter. The summer sampling was done in the month of May, the monsoon and winter seasons wererepresentedby the months of August and November, respectively. List of all the foods consumed from all the food groups by each respondent was prepared.

Samples of the raw cereals, pulses, condiments, spices and vegetables and tea leaves commonly consumed by the population were collected from the

families or from the village shop. The residential history was recorded through a structured pretested questionnaire. Fluoride intake was estimated, for this one fifth sample of all the foods (solid and liquid) consumed by each selected respondent was collected for three consecutive days. This included the drinking water and the beverages like tea, butter milk etc. The total intake was calculated for each respondent and the average of three days calculated. Calculation of F' content through food villa method (1979) was used. The total intake through tea and water, by each individual was also separately recorded. The daily F' intake from these two liquids separately were computed. The spot urine samples were collected of all subjects for three days each during summer, winter and monsoon and analysed for F' content.

Potable water, urine, tea, salt, composite diet samples, pulses and legumes, green leafy vegetables, spices and condiments consumed by the rural population were also analysed for F' content.

All the potable water sources analysed in the village contained F' substantially higher than the safe level of 0.5 ppm. The municipal water also contained more $\overset{F}{\underset{\wedge}{\text{A}}}$ (1.08 ppm) than the recommended levels. The F' content of wells water ranged from 2.03 to 3.07 and ~~that~~ of handpumps water varied from 2.03 to 4.33 ppm. The depth of wells ranged from 18 to 22 feet.

The maximum (50%) of selected subjects were in the age group of 30 to 40 years. About 80% of the subjects consumed water with F' level of 2.0 to 3.5 ppm, 6% consumed $\underset{\wedge}{\text{A}}$ less and 14% $\underset{\wedge}{\text{A}}$ more than this $\overset{\text{level of F'}}{\underset{\wedge}{\text{A}}}$. Out of the raw vegetables, amongst roots and tubers; carrots contained maximum (3.2 ppm) F', amongst green leafy vegetables, spinach had 3.8 ppm F', red chillies had 10 ppm F' on dry matter basis. On fresh matter basis the F' content of potato was maximum (0.45 ppm) followed by carrots (0.44 ppm) and onion (0.40 ppm), respectively.

Among all green leafy vegetables, chana leaves (0.36 ppm), spinach (0.26 ppm) *had* notably high, while other vegetables had F' content ranging from 0.05 to 0.1 ppm. Among all the *pulses* and *legumes* maximum F' was in Bengal gram followed by green gram and black gram which had least F' content. *Out* of all *spices* and condiments cardamom contained maximum (12.5 ppm) F'. Rock salt had more F' than the other salt samples.

(The F' intake of fluorotic subjects was significantly higher than that of normal subjects during three different seasons. The intake of F' through food and tea in two seasons i.e. summer and monsoon was almost similar in all the subjects. In all the three seasons, the proportion of F' from food, drinking water and tea remained similar for the normal and fluorotic subjects.)

The urinary F' excretion of fluorotics was less than the normal subjects. No seasonal differences were found in any group. There was positive correlation of F' intake and spot urinary F' excretion in all the four groups studied.

Regarding relationship of nutritional status with the prevalence of fluorosis 68% each of the fluorotic ^{males and females} were mildly to severely undernourished. *Fifty* ~~two percent~~ and 44% of non-fluorotic males and females, respectively were mild to severely undernourished. Sixty two per cent of the total subjects had moderate degree of dental fluorosis. 26% had mild and 10% had very mild degree of dental fluorosis was observed.