CHAPTER VI

ANALYSIS OF NUTRITIONAL STRUCTURE
Nutritional structure shows the general measurement of daily diet of the people. It is characterized by the dietary habits, and nutritional level of the people - quantitatively and qualitatively.

BALANCED DIET

For adequate maintenance of good health, it is necessary to supply all the nutrients in the proper amounts and proportions in the diet. Balanced diet may also be defined as a diet which contains all the essential nutrients properly. Lack of adequate food supply generally leads to deficiency diseases.

Based on the type of food available in India, nutrition experts of Indian Council of Medical Research (ICMR) have suggested the composition of a typical balanced diet for an
Indian adult as follows:

**TABLE 6.1**

<table>
<thead>
<tr>
<th>Groups Particulars</th>
<th>Calories (gm)</th>
<th>Protein (gm)</th>
<th>Calcium (mg)</th>
<th>Iron (mg)</th>
<th>Vitamin A (IU)</th>
<th>Thiamin (mg)</th>
<th>Riboflavin (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man</td>
<td>2400</td>
<td>55</td>
<td>0.5</td>
<td>20</td>
<td>3000</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td>Moderate work</td>
<td>2800</td>
<td>55</td>
<td>0.5</td>
<td>20</td>
<td>3000</td>
<td>1.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Heavy work</td>
<td>3900</td>
<td>55</td>
<td>0.5</td>
<td>20</td>
<td>3000</td>
<td>2.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Women</td>
<td>1900</td>
<td>45</td>
<td>0.5</td>
<td>30</td>
<td>3000</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Moderate work</td>
<td>2200</td>
<td>45</td>
<td>0.5</td>
<td>30</td>
<td>3000</td>
<td>1.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Heavy work</td>
<td>3000</td>
<td>45</td>
<td>0.5</td>
<td>30</td>
<td>3000</td>
<td>1.5</td>
<td>177</td>
</tr>
</tbody>
</table>


In respect of food availability and distribution the quantitative factor alone is not important, but the qualitative factor is also equally important.

As far as geographers are concerned the diet of the different groups as a whole is important rather than the diet of the individual. Generally, each community forms a uniform habit. It varies from one culture group to another. Generally vegetarian diet is directly influenced by the local religious concepts and traditions. Availability of food stuffs also directly influence the dietary habits of the people. Besides
this, economic structures of the respective places also determine the dietary practices of the region, because purchasing power plays an important role to decide the food-stuffs for eating. Easily available food-stuffs become a part of the diet of any region first of all.

As far as study unit is concerned the vegetarian and non-vegetarian diet has been accepted by both types of majority of the people. The higher cost of non-vegetarian food-stuffs is also one cause for its being uncommon due to poverty of the region. As far as dietary pattern of the region is concerned the religious concept, economic status and availability of food stuffs etc. are the main factors which determine the dietary pattern in the study unit. The dietary pattern in the area also varies from season to season because availability of cereals, fruits and vegetables are quite different from one season to another.

DIET SURVEY: METHODS AND TECHNIQUES

Diet survey aims to collect quantitative information regarding dietary patterns and food habits. The aim of this survey is to provide information on the kinds of food consumed and the frequency with which these foods appear in the diet.

There are four methods of diet survey by which scientists usually conduct survey in India, (i) Weighment of raw foods (ii) Oral questionnaires method (iii) Weighment of cooked foods and (iv) checking of stock by inventory. The
scholar used oral questionnaires method, a. this method took lesser time, which enabled him to cover a larger area in comparison to other known methods of the diet survey. The aims of such survey are to find out the following:

- The level of nutrition of the study area.
- Foods that people eat.
- How far existing diets are satisfactory.
- Main factors responsible for the poor diet and the basic cause of inadequacy, if any.

To improve the nutritional conditions of a population, it is essential to know the amount and type of food consumed by different people. The diet of the people differs from place to place and difficulties are also erected by the customs and prejudices which determine the food consumption pattern. The diet of the region is also well determined by the crops produced locally.

For diet survey detailed questionnaires were prepared (Details in Appendix B and C) which include:

1. Number of members of the family
2. Occupation
3. Monthly expenditure
4. Dietary habits
5. Total consumption of food stuffs by the family on the previous day.
6. Consumption of vegetables, fruits, milk, sugar etc.
7. Main diseases.
Besides this, during diet survey a detailed note on the selected villages and urban centres was also collected. This includes information on facilities of water, medical, shopping, transportation, general environmental conditions and other problems which affect the diet of the people.

SELECTION OF VILLAGES

In the study region 67 per cent population lives in villages (rural areas) and as such the diet survey was conducted separately in both the urban as well as rural places to find out the nutritional level of the people. This was done through oral questionnaires method in which the author himself interviewed the selected families spread over in the entire region.

To find out the nutritional status of the people, a diet survey was decided to cover 0.5 per cent of the total number of villages selected on the basis of crop-zones while urban centres are selected on the basis of their typical characteristics. The entire region was divided into 5 crop zones. The sample villages were selected zone-wise.

In the first step, the blocks of each zone were arranged alphabetically with their respective tahsils. The villages of each zone were serially numbered.

The number '3' was initially selected at random from box containing serial number 1 to 200. As the author aims to cover 0.5 per cent of the villages, every 200 villages have
been taken from the Census Handbook of the respective tahsils. The starting number of village in each zone being '3', the villages bearing serial number 203, 403, 603 etc. were taken out for the diet survey. In this way the Scholar has conducted diet survey in nineteen villages in which 163 families were interviewed.

Besides rural areas, 5 urban centres were also selected for diet survey on the basis of their typical characteristics. Out of 14 urban centres in the study region 5 were chosen with the total number of families as 63 for diet survey.

In the nineteen villages and 5 urban centres, the Scholar has conducted diet survey among a total 226 families. The names of villages and urban centres, where survey was conducted, are given in Appendix - A.

DIET CALCULATIONS

The analysis of diet schedule has been done with the help of various reports of Indian Council of Medical Research (ICMR). The average diet of each member was resolved into different nutrients like calories, proteins, vitamins, minerals etc. The daily per head consumption of food-stuffs was calculated in 6 parts:

(i) Per day family consumption of food items.
(ii) Family converted into adult unit according to the following scale which is suggested for practical nutrition work in India by nutritional experts:
Adult Male (sedentary worker) ... 1.0
Adult Male (Moderate worker) ... 1.2
Adult Male (Heavy worker) ... 1.6
Adult Female (sedentary workers) ... 0.8
Adult Female (Moderate worker) ... 0.9
Adult Female (Heavy worker) ... 1.2
Adolescents 12 to 21 years ... 1.0
Children 9 to 12 years ... 0.8
Children 7 to 9 years ... 0.7
Children 5 to 7 years ... 0.6
Children 3 to 5 years ... 0.5
Children 1 to 3 years ... 0.4


(iii) To reduce the above values in terms of the total members so as to obtain consumption of food item per adult unit per day.

(iv) Food items converted into different nutrients according to their nutritive value (Table 5.1).

(v) To obtain the total intake of different nutrients in a day.

(vi) To convert community-wise and urban centre-wise nutrients as per head per day.

In this way, the quantity of different nutrients of the people of the region has been calculated community-wise and urban centre-wise. Similarly, on the basis of community
diet, an average nutritional level of the entire region has also been calculated. So, the scholar prepared level of nutrition at community level and urban centre-wise as well as for the entire region also.


dIETARY PATTERN

Dietary Habits

A food may be defined as any substance which is taken into the body and is utilised to yield heat or energy to build new tissues and to regulate body processes.

The dietary habits of the region directly depend upon the production of the respective area. Food habits are also very well influenced by social customs, religious beliefs etc. As far as this region is concerned, people of the villages are marked with differences of their cropping pattern with the result that the consumption pattern of these villages is also of different nature. The rural people of the region take their food three times a day.

Breakfast

The main item of breakfast of the people of the region is 'Basi' i.e. the previous day's food, which is specially left for next morning, after putting sufficient water in it. Another preparation is liquid form known as 'Rej' (of wheat, rice or jowar) and 'Chapati' is taken with 'Chatni' (salt and chillies ground together). This also varies from season to
season. It differs in quantity also in different groups. 
Male members generally take much because they go to the field 
for heavy work, while the females and children take light 
breakfast as they have to remain at home for doing the house 
work.

LUNCH

The main items of lunch are as follows:
(a) Dal (pulse) (b) Chapati (c) Rice (d) Vegetables.
It varies from season to season and also depends upon the 
availability of production of cereals. Availability of vege-
tables also varies from season to season.

DINNER (NIGHT FOOD)

It is almost like lunch, but also includes the products 
of milk and curds and 'Dalia', and are very common for diet 
in most of the area under study.

OTHER CHARACTERISTICS

Fruit consumption depends upon their availability and 
are mostly seasonal. Special diet is given to old men, viz. 
'Khichari' etc. Children and sick people also get special 
food. The people of the region are mostly vegetarian.

The dietary habits of rural people of study region 
differ in terms of quality from season to season, but that of 
urban people habits don't differ much. Intake of Rice, Wheat, 
Pulses, Vegetables, Milk and Fruits are predominant. But the
labours or low standard families in the urban areas generally take vegetables instead of pulses.

QUALITATIVE ANALYSIS OF RURAL DIET

PATTERN OF CEREAL INTAKE

The actual intake of the various constituents of food by the rural people of study region is observed on the basis of diet survey, and it is found that the consumption of cereal is higher than other food-stuffs. It includes wheat, rice, jowar, kodon-kutki, maize etc. As far as production is concerned, the production of rice and wheat is much. So, the people of the area easily get these cereals. Per head intake of cereals is given in Table 6.2. The consumption pattern of cereals also varies from one community to another. As against required intake, the average cereals' intake of different communities varies from 453.7 to 573.6 gm per day per person. Details regarding different food-stuffs of different communities are given in Table 6.2.

The maximum cereal consumption per head per day has been reported in Thakurs (viz. 573.6 gms). It is followed by Brahmins (544.4 gms), Backward classes (532.0 gms), Scheduled Caste (S C) (513.9 gms) etc. The lowest intake is reported in Jains (453.7 gms) which is followed by Scheduled Tribes (S T) (486.3 gms), and Mohammadans (472.7 gms) (Plate 14 A).
The pulses consumption of the area is 44.6 gm per head per day (Table 6.2). The consumption pattern of pulses varies from community to community in the study unit. The average consumption of pulses varies from 13.8 gm to 60.6 gm per day per head. The low class communities (viz. S T) intake is quite low, viz. 13.8 gm per person per day, followed by S.C. (43.2 gm), Brahmins (43.8 gm), Mohammedans (44.9 gm). The intakes of other communities are quite high, the highest being in Jains viz. 60.6 gm per head per day. The common pulses of the region are Gram, Tur, Teora, Masure and Urd which are generally used by the people of the region.

Pattern of Vegetables Intake

An attempt has been made in Table 6.2 to show the per head per day consumption of vegetables of the study unit which is 107.4 gm. The intake of vegetables varies from community to community but standard of community in general does not seem to affect the consumption of vegetables. It ranges from 80.9 gm per head per day to 165.3 gm per head per day. The highest vegetable intake has been reported in Jains 165.3 gm and lowest in Scheduled Tribes, i.e. 80.9 gm per head per day.

The important vegetables in the study region are potato, onion, lady finger, brinjal, tomato etc. Leafy vegetables and dry vegetables such as mustard leaf etc. have their own importance in the diet of the people.
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of community</th>
<th>Cereals</th>
<th>Pulses</th>
<th>Vegetables</th>
<th>Milk</th>
<th>Sugar</th>
<th>Oil &amp; fats</th>
<th>Fruits</th>
<th>Flesh foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Backward Classes</td>
<td>232.0</td>
<td>56.8</td>
<td>113.0</td>
<td>66.7</td>
<td>7.5</td>
<td>5.8</td>
<td>21.8</td>
<td>3.8</td>
</tr>
<tr>
<td>2</td>
<td>Brahmins</td>
<td>544.4</td>
<td>43.8</td>
<td>107.5</td>
<td>45.9</td>
<td>13.1</td>
<td>7.8</td>
<td>23.6</td>
<td>0.2</td>
</tr>
<tr>
<td>3</td>
<td>Jains</td>
<td>453.7</td>
<td>60.6</td>
<td>165.3</td>
<td>125.6</td>
<td>18.6</td>
<td>11.7</td>
<td>26.0</td>
<td>2.9</td>
</tr>
<tr>
<td>4</td>
<td>Mohammedans</td>
<td>472.7</td>
<td>44.9</td>
<td>104.3</td>
<td>63.3</td>
<td>10.3</td>
<td>4.5</td>
<td>9.0</td>
<td>14.7</td>
</tr>
<tr>
<td>5</td>
<td>Scheduled Caste</td>
<td>513.9</td>
<td>43.2</td>
<td>83.7</td>
<td>87.6</td>
<td>3.1</td>
<td>6.2</td>
<td>20.9</td>
<td>3.9</td>
</tr>
<tr>
<td>6</td>
<td>Scheduled Tribes</td>
<td>486.3</td>
<td>13.8</td>
<td>80.9</td>
<td>0.8</td>
<td>0.4</td>
<td>4.5</td>
<td>21.9</td>
<td>8.5</td>
</tr>
<tr>
<td>7</td>
<td>Thakurs</td>
<td>573.6</td>
<td>49.0</td>
<td>97.1</td>
<td>72.1</td>
<td>4.8</td>
<td>4.4</td>
<td>22.9</td>
<td>17.1</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>510.9</strong></td>
<td><strong>44.6</strong></td>
<td><strong>107.4</strong></td>
<td><strong>66.0</strong></td>
<td><strong>8.3</strong></td>
<td><strong>6.4</strong></td>
<td><strong>20.9</strong></td>
<td><strong>7.3</strong></td>
</tr>
</tbody>
</table>

Source: Based on Diet Survey.
PATTERN OF MILK AND MILK PRODUCTS INTAKE

The Table 6.2 shows an average per head per day intake of milk and milk products. This intake, however, tallies closely with the All India intake of 66.0 gm per capita per day.1 Jains have the highest intake of milk and milk products i.e. 125.6 gm per day while the Scheduled Tribes have only 0.9 gm, Scheduled Castes (87.6 gm) followed by Thakurs (72.1 gm), Backward classes (66.7 gm), Mohammadans (63.3 gm) and Brahmins (45.9 gm) per head per day. The community Scheduled Tribe has reported low intake of milk and milk products due to their being purely poor labour and that is why they are not capable to take other extra foodstuffs except compulsory cereals.

PATTERN OF SUGAR AND JAGGARY INTAKE

Quantitatively, consumption of sugar and jaggary also appears to have a significant contribution. On an average, per head per day consumption of sugar and jaggery comes to about 8.3 (Table 6.2). The intake varies from 0.4 gm to 18.6 gm. In the community of Scheduled Tribes intake is 0.4 gm only per person per day while it is 18.6 gm in Jains. There seems to be a significant difference among the communities in the region (Plate 14 A).

PATTERN OF OIL AND FATS INTAKE

The average intake per head per day in respect of

edible oils and fats is about 6.4 gm. It is usually used as a cooking medium. The per head per day quantities of oil and fat consumed by different communities amongst Thakurs, Scheduled Tribes, Mohammadans and Backward classes are very low, i.e. only 4.4, 4.5, 4.5 and 5.8 gm respectively. As far as the study unit is concerned, the highest oil intake has been reported among Jains 11.7 gm, Brahmins 7.8 gm and the Scheduled Castes 6.2 gm per head per day. In these communities mainly groundnut, rape and mustard and linseed oils are used. In general, all the communities the quantity of oil consumption increases with the increase in the income.

PATTERN OF FRUITS INTAKE

The consumption of fruits in the rural area is 20.9 gm only per day per person. This is a little more than the consumption of milk and milk products. This consumption
of food is reported low in comparison to other communities of the area (Plate 14 B).

The absence of food stuffs like pulses, vegetables, milk and sugar in diet of Scheduled Tribes is main cause of the low intake of food-stuffs, because these items are much costly to the labour population.

MEDIUM LOW INTAKE

Scheduled Caste and Mohammadans are reported under this category. Scheduled Castes rank second in pulses, vegetables, sugar and fruits and rank fourth in cereals, oil and fats and flesh foods. Regarding the Mohammadans, they rank first in fruits, second in cereals, oil and fats and third in milk intake. Rank sixth is reported in the flesh food because the Mohammadans always like to take meat or other non-vegetarian diet.

MEDIUM INTAKE

The communities reported under this category are the Backward Classes, Brahmins and Thakurs. Backward classes rank third in oil and fats, fruits and flesh foods, rank fourth in milk and sugar, rank sixth in pulses and vegetables. Brahmins rank first in flesh food, second in milk, and sixth in cereals, sugar and fruits. Thakurs rank first in oil and fats, third in vegetables and sugar, seventh in cereals and flesh food intake.
Diets of people are equally distributed in respect of all the food-stuffs.

HIGH INTAKE

The Jains are reported high in the intake of food-grains and non food-grains which rank sixth and seventh while the cereals and flesh food rank first and second respectively.

QUANTITATIVE ANALYSIS OF RURAL DIET

NUTRIENT-WISE

The diet survey was conducted by the author to find out the nutritional level of the people by the oral questionnaire method in selected 19 villages and 5 urban centres of the study region. In this process 163 families were interviewed from the rural area, whereas 63 families were selected from urban area. During the diet survey the following points were always kept in mind while selecting a family in every selected village:

(i) The survey should be equally distributed over the entire village.

(ii) The survey should also cover all the communities of the village. At least 2-2 families of Scheduled Caste and Scheduled Tribes must be taken, if available.

Rural diet is directly influenced by the availability of food-stuffs because the people of rural areas are generally engaged in cultivation. The dietary difference found here is only due to the purchasing power of the people and availability

1 High Intake
of employment, while traditions and religious concepts also very well affect the dietary pattern of the people.

CALORIES

The average per head per day consumption of calories in the rural areas of study unit is 2206.5 against the recommended allowance of 2700 calories. But it is not uniformly shown in all the communities. The Table 6.4 shows the actual picture of the intake of calories which varies from community to community. As against the required intake, the average calories intake in different communities varies from 1956 to 2493 per head per day. Details regarding different nutrients of different communities are given in Table 6.4 and Plate 15 A.

Among all the communities the maximum calories consumption has been reported in the Thakurs i.e. 2405. It is followed by Brahmins (2340) the backward classes (2316) and Jains (2269). The lowest intake is reported in Mohammadans (1956) which is followed by Scheduled Tribes (1965) and Scheduled Castes (2195). Calorie intake was found satisfactory only in these communities where people consumed varieties of foodstuffs. But all the communities, where survey was conducted in the study area were found deficient as far as calories intake is concerned. On the basis of village reports prepared by the Scholar it can be said that the people of the

1. This average taken from the allowances recommended by the ICMR, Hyderabad, for various group, Table 6.1.
area get about 80 per cent of their calories through cereals and intake of the region depends mostly on the pattern of food production. Besides cereals, pulses, sugar and vegetables also form the other source of the calories.

PROTEIN

Protein is that element of the food which is used for the construction and repair of the body. It is an essential constituent of the diet. It is required more during the period of growth. According to Mitra (1953)\(^{1}\), the average protein will be required in different physiological conditions like childhood, lactation and pregnancy.

In the study unit, the highest protein intake has been reported among the Thakurs i.e. 70.4 gm and lowest 56.8 in the Mohammadans per head per day. Details of different communities are given in Table 6.4. Average intake of protein in the area is 64.0 gm. It varies from community to community as well as from family to family depending upon their income and availability of the food-stuffs. Among the children protein deficiency has been observed by the Scholar himself also during diet survey. Main source of protein in the region is only pulses.

CARBOHYDRATE

It supplies energy for work, play and other forms of vital activity and furnishes fuel to maintain heat. The intake

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of carbohydrate varies from family to family in different communities. It varies from 376.5 gm to 587.8 gm per head per day. Details are given in Table 6.4. The main source of carbohydrates in the region are sugar and other sweet fruits etc.

CALCIUM

The intake of calcium in the study unit is reported lowest in the Mohammedans 297.3 mg and highest in the Scheduled Tribes i.e., 1268 mg per day per head.

The consumption of calcium is reported high in scheduled tribes because, in the rural and remote areas, the tribals take Rajgira and Rape leaves (dried) almost during the whole year. The nutritive value of these leaves in per 100 gms is very high i.e., 676 mg and 3095 mg respectively. The tribal people store the dried leaves of these vegetables in the season and later use it. This practice is prevalent because the green vegetables are not available for the whole year round, and also due to lack of purchasing power.

I.I.

Nutrition survey carried out by the Nutritional Research Laboratories, Hyderabad indicates that about 20.2 per cent of the Indian population suffer from iron deficiency, anaemia. The Nutritional Advisory Committee recommended in 1944 dietary allowances of iron for adults i.e., $20.3^a$ mg.¹

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### TABLE 6.4

**NUTRIENTS INTAKE PER HEAD PER DAY IN THE RURAL AREAS OF UPPER NARMADA BASIN**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of community</th>
<th>Calorie (gm)</th>
<th>Protein (gm)</th>
<th>Carbohydrate (gm)</th>
<th>Calcium (mg)</th>
<th>Iron (mg)</th>
<th>Vitamin A (IU)</th>
<th>Thiamin (mg)</th>
<th>Riboflavin (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Backward Classes</td>
<td>2316.1</td>
<td>63.6</td>
<td>475.7</td>
<td>446.4</td>
<td>25.8</td>
<td>1941.4</td>
<td>1.8</td>
<td>0.8</td>
</tr>
<tr>
<td>2</td>
<td>Brahmins</td>
<td>2340.0</td>
<td>65.8</td>
<td>474.0</td>
<td>583.0</td>
<td>24.6</td>
<td>1884.3</td>
<td>1.5</td>
<td>0.6</td>
</tr>
<tr>
<td>3</td>
<td>Jains</td>
<td>2268.7</td>
<td>58.6</td>
<td>436.6</td>
<td>438.6</td>
<td>22.1</td>
<td>1960.2</td>
<td>1.4</td>
<td>0.7</td>
</tr>
<tr>
<td>4</td>
<td>Mohammedans</td>
<td>1956.0</td>
<td>56.8</td>
<td>415.2</td>
<td>297.3</td>
<td>21.9</td>
<td>1879.7</td>
<td>1.3</td>
<td>0.6</td>
</tr>
<tr>
<td>5</td>
<td>Scheduled Castes</td>
<td>2194.7</td>
<td>63.8</td>
<td>445.8</td>
<td>512.2</td>
<td>24.0</td>
<td>2151.0</td>
<td>1.7</td>
<td>0.7</td>
</tr>
<tr>
<td>6</td>
<td>Scheduled Tribes</td>
<td>1964.5</td>
<td>69.3</td>
<td>376.5</td>
<td>1268.9</td>
<td>18.0</td>
<td>1937.6</td>
<td>3.0</td>
<td>1.2</td>
</tr>
<tr>
<td>7</td>
<td>Thakurs</td>
<td>2405.5</td>
<td>70.4</td>
<td>587.8</td>
<td>344.9</td>
<td>22.3</td>
<td>1921.1</td>
<td>1.6</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td><strong>2206.5</strong></td>
<td><strong>64.0</strong></td>
<td><strong>458.8</strong></td>
<td><strong>555.9</strong></td>
<td><strong>22.6</strong></td>
<td><strong>1953.6</strong></td>
<td><strong>1.7</strong></td>
<td><strong>0.7</strong></td>
</tr>
</tbody>
</table>

**Source:** Based on Diet Survey.
Among all the communities of the region, iron intake varies from 16.0 mg to 25.8 mg per head per day. The intake in most of the community except the scheduled Tribes (18 mg) tallies the recommended allowance of 20-30 mg.

The average intake of iron of the area is 22.6 mg per day per head. Deficiency in diet is reported due to less consumption of iron-rich food-stuffs by the people of the area. Details are given in Table 6.4.

VITAMIN A

In the region average intake of Vitamin A is 1953.6 IU which is very low against the recommended allowances. It varies from 1879.7 in Mohammedans to 151.7 IU in Scheduled Castes, 1960.2 in Jains and 1937.6 IU in Scheduled Tribes. Details are given in Table 6.4. This is due to inadequate consumption of leafy vegetables, fruits as well as the ignorance regarding importance of nutrients. High cost of Vitamin A content food-stuffs also play very important role in the diet of the people.

VITAMIN B₁

Cereals are main source of B₁ vitamin. Rural diet of the region basically depends on cereals, so that this vitamin is found more or less adequate in the diet of the people of study unit. The average intake is 1.7 mg per head per day, while it varies from 1.3 mg in Mohammedans to 3.0 mg in the scheduled Tribes. The highly reported intake of Vitamin B₁
INTAKE OF NUTRIENTS PER HEAD PER DAY
(RURAL AREA)

A

ACUMULATED RANK OF NUTRIENTS INTAKE
(RURAL COMMUNITIES)

B
in the scheduled tribes is due to the fact that people in the remote rural areas depend on cereals only. In other communities Thiamine intake is reported below 1.8 mg per head per day.

Riboflavin B₂

The intake of riboflavin in the area is much less according to recommended allowances. The average intake of the region among different communities is only 0.7 mg per head per day, while recommended allowances is 2.5 mg. Cereals are the major source of riboflavin. Pulses and vegetables are the other sources of this vitamin as far as study region is concerned. Details are in Table 6.4. Various types of B₂ deficiency have been reported as observed during diet survey is the study unit.

Mohammedans

Vitamin A

Mohammedans

Low Intake

It may be noticed from the Table 6.5 that the diet of the Mohammedans is deficient in calorie, protein, calcium, vitamin A, Thiamine and Riboflavin. Mohammedans rank first in calorie, protein, calcium and Vitamin A; Thiamine and Riboflavin rank second in carbohydrates and iron. Thus the diet of the Mohammedans is very poor in the study area.

1. Low Intake
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Community</th>
<th>Calorie (gm)</th>
<th>Protein (gm)</th>
<th>Carbohydrate (gm)</th>
<th>Calcium (mg)</th>
<th>Iron (mg)</th>
<th>Vitamin A (IU)</th>
<th>Thiamin (mg)</th>
<th>Riboflavin (mg)</th>
<th>Accumulated Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mohammedans</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Scheduled Tribes</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>5</td>
<td>32</td>
</tr>
<tr>
<td>3</td>
<td>Scheduled Caste</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>5</td>
<td>2</td>
<td>35</td>
</tr>
<tr>
<td>4</td>
<td>Jains</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>Backward Classes</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>4</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>3</td>
<td>39</td>
</tr>
<tr>
<td>6</td>
<td>Brahmins</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td>7</td>
<td>Thakurs</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>36</td>
</tr>
</tbody>
</table>

Sources: Based on the Diet Survey. (Rank 1 = Low intake)
MEDICAL INTAKE

Among all the communities the diet of the Jains is reported medium intake category due to the protein and vitamins B₁ and B₂ being low. Protein, thiamine and Riboflavin are reported in rank second and carbohydrate, calcium and iron reported in rank third.

TABLE 6.6
ACCUMLATED RANK OF NUTRIENTS INTAKE

<table>
<thead>
<tr>
<th>Community</th>
<th>Rank</th>
<th>Community</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mohammadans</td>
<td>10</td>
<td>Scheduled Caste</td>
<td>35</td>
</tr>
<tr>
<td>Jains</td>
<td>25</td>
<td>Thakurs</td>
<td>36</td>
</tr>
<tr>
<td>Scheduled Tribes</td>
<td>32</td>
<td>Backward Classes</td>
<td>39</td>
</tr>
<tr>
<td>Brahmins</td>
<td>34</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Lowest figures means highest deficiency.

Source: Based on diet survey.

MEDICAL INTAKE

Scheduled Tribes, Brahmins, Scheduled Caste and Thakurs are reported under this category. Scheduled Tribes rank first in carbohydrate and iron, second in calorie and fourth in Vitamin A and Riboflavin. Brahmins rank first in Riboflavin, second in Vitamin A and fifth in protein and carbohydrate and sixth in calorie, calcium and iron. Scheduled Castes occupied rank fifth in calcium, iron and thiamine and seventh in Vitamin A. The Thakurs hold fourth rank in iron and Thiamine
and seventh in calorie, protein and carbohydrate (Plate 153).

HIGH INTAKE

Among all the communities, the diet of the backward people is most favourable as far as iron, carbohydrate and thiamine are concerned. They rank fifth in calorie and vitamin A, sixth in carbohydrate and thiamine and seventh in iron intake. As far as the diet of the backward classes is concerned, it is high because of consumption of vitamins.

QUALITATIVE ANALYSIS OF URBAN DIET

The analysis of diet structure was arranged urban Centre-wise. Five urban centres have been surveyed by the author to detect the nutritional level of the urban people.

PATTERN OF CEREAL INTAKE

The Table 6.6 shows the cereal consumption of the urban centres of study region, and is less than the rural areas. The consumption pattern of cereals also varies from one urban centre to the other. The average intake of cereals varies from 401.5 gm to 486.0 gm per head per day. Details regarding different food stuffs in different centres are given in Table 6.6.

The highest cereals consumption has been reported in Jabalpur i.e. 486.0 gm. It is followed by Katni 484.8 gm, Suhara 454.9 gm etc. Lowest intake is reported in Nandla (401.5 gm) and Vindori (444.2 gm) per head per day. In the
urban centres of study area the people are not dependant on cereals only, but they are generally using other foodgrains, vegetables and other sources of nourishment (Plate 16 A).

PATTERN OF PULSE INTAKE

The average intake of pulses of the urban centres of the study region is 65.0 gm (Table 6.5). The average consumption of pulses varies from place to place — it is from 46.7 gm in Sehore to 82.0 gm in Sidhore. In Jabalpur and Sidhore the protein intake is quite low. The common pulses which are consumed are Tur, Masuri and Mung.

PATTERN OF VEGETABLE INTAKE

The average consumption of vegetables of the study region is 168.0 gm. Intake of vegetables varies from place to place while the income is the main factor to affect the vegetable intake in different family standard (intake ranges from 100.0 gm to 255.4 gm per head per day). The highest vegetable intake has been reported from Kathni i.e. 255.4 gm and lowest from Jabalpur i.e. 100 gm per person per day. In the Table 6.7 details of other centres are shown. Almost all the vegetables are available in the centres of the area.

PATTERN OF OIL INTAKE

The per head per day consumption of edible oils is about 13.0 gm (Table 6.7). It is usually used as a cooking medium. The per head per day quantities of oil consumed in
**TABLE 6.7**

FOODSTUFFS INTAKE PER HEAD PER DAY IN THE URBAN AREAS OF UPPER NARMADA BASIN

(in gms.)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Urban Centre</th>
<th>Cereals</th>
<th>Pulses</th>
<th>Vegetables</th>
<th>Milk</th>
<th>Sugar</th>
<th>Oil &amp; Fats</th>
<th>Fruits</th>
<th>Flesh Foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dindori</td>
<td>444.2</td>
<td>82.0</td>
<td>164.5</td>
<td>110.2</td>
<td>16.9</td>
<td>8.2</td>
<td>5.6</td>
<td>11.6</td>
</tr>
<tr>
<td>2</td>
<td>Jabalpur</td>
<td>486.0</td>
<td>56.7</td>
<td>100.0</td>
<td>104.4</td>
<td>22.3</td>
<td>14.9</td>
<td>20.2</td>
<td>19.5</td>
</tr>
<tr>
<td>3</td>
<td>Katni</td>
<td>484.8</td>
<td>64.2</td>
<td>255.4</td>
<td>231.1</td>
<td>29.8</td>
<td>16.8</td>
<td>37.3</td>
<td>10.5</td>
</tr>
<tr>
<td>4</td>
<td>Mandla</td>
<td>401.5</td>
<td>75.6</td>
<td>195.0</td>
<td>100.1</td>
<td>14.0</td>
<td>9.1</td>
<td>4.9</td>
<td>10.2</td>
</tr>
<tr>
<td>5</td>
<td>Sehora</td>
<td>454.6</td>
<td>46.9</td>
<td>125.2</td>
<td>146.4</td>
<td>22.6</td>
<td>16.2</td>
<td>22.4</td>
<td>10.3</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td>454.2</td>
<td>65.0</td>
<td>168.0</td>
<td>138.4</td>
<td>21.1</td>
<td>13.0</td>
<td>18.2</td>
<td>12.4</td>
</tr>
</tbody>
</table>

**Source:** Based on the Diet Survey.
the urban centres of Dindori and Mandla are very low, i.e. only 8.2 and 9.1 gm respectively. Highest oil intake has been reported from Katni and Sihora i.e. 16.8 and 16.2 gm per head per day respectively. In these centres mainly groundnut and vegetables oils are used.

**Pattern of Sugar and Jaggery Intake**

An attempt has been made in Table 6.7 to show the per head per day consumption of Sugar and Jaggery which is about 21.1 gm. The intake varies from 14.0 gm to 29.8 gm. In the Mandla centre, intake is only 14.0 gm per person per day while it is 29.8 gm in the Katni centre. Intake of these is highly reported in Jabalpur in comparison to Mandla district's urban centres.

**Pattern of Milk and Milk Products Intake**

Quantitatively the consumption of Milk and Milk Products also appears to have a significant contribution. On an average per head per day consumption of milk and milk products in the area is 138.4 gm per day per head. This intake is, however, higher than the all India intake of 65.0 gm per head per day. Katni has the highest intake of milk and milk products, i.e. 231.1 gm while Mandla has 100.1 gm only, followed by Jabalpur (194.4 gm), Dindori (110.2 gm) etc.

**Pattern of Fruits Intake**

The average consumption of fruits is 18.2 gm only per head per day. It is a little more than the consumption of
INTAKE OF FOODSTUFFS PER HEAD PER DAY
(URBAN AREA)

(A)

IN GRAMS

CEREALS  PULSES  VEGETABLES  FRUITS  MILK  FLESH FOOD  SUGAR AND JAGGERY  OILS

RECOMMENDED ALLOWANCE
ACTUAL INTAKE

ACCUMULATED RANK OF FOODSTUFFS INTAKE
(URBAN AREA)

(B)

ACCUMULATED RANK

MANDLA  DINDORI  SEHORA  JABALPUR  KATNI
milk and milk products. The average intake of fruits varies from 5.6 gm in Jindori to 37.3 gm in Katni. The centres Jindori and Mandla are quite low, because the people are not taking fruits frequently as they feel that the fruits are not sufficient to give the energy. The intake of other centres of Jabalpur district is quite high, the highest being Katni (137.3 gm), Sehora (22.4) and Jabalpur (20.2 gm) per head per day (Plate 16 A).

PATTERN OF FLESH FOOD INTAKE

Non-vegetarians consider the taking of flesh foods as only a minor part of the meals. The average intake of flesh foods of the study region in urban areas is 13.4 gm (Table 6.6). The highest consumption of these is in Jabalpur 19.5 gm and the lowest in Mandla 10.2 gm per head per day. Details are given in Table 6.6.

RANKING OF DIET

FOODSTUFFS RANK

LOW INTAKE

The diet of the people of Mandla town is low because the cereals, milk, sugar and flesh food intake is low and reported ranks first, while oil, fats and fruits rank second.

MEDIUM INTAKE

Jindori, Jabalpur and Sehora come under this category. Jindori ranks first in oil, fats, fruits and fifth in pulses, 1 Low Intake
Jabalpur ranks third in sugar, oil, fats and fruits, fifth in cereals and flesh foods intake while Sehora ranks fourth in four foodstuffs viz. milk, sugar, oil-fats and fruits.

The diet of the people of these towns is just the same in respect of the foodgrains (Plate 16 b).

HIGH INTAKE

Katni ranks third in pulses and flesh food, fourth in cereals and fifth in vegetables, milk, sugar, oil, fats and fruits. That is why the diet of the people of Katni is reported high.

QUANTITATIVE ANALYSIS OF URBAN DIET

NUTRIENT-WISE

An attempt has been made to detect the consumption of different foodstuffs in the diet of the urban people in the region who get their calories from various food-stuffs.

CALORIES

The average calorie intake of the region (2367) is lower than the allowances recommended by IQMR. Although the intake of calories varies from place to place, the urban centre of Jabalpur district i.e. Katni has been reported 2749 calories per head per day. It is followed by 2399 in Jabalpur, 2318 in Sehora etc. while the lowest intake reported in Mandla i.e. 2167 calories per head per day. The consumption of calories intake in various places are given in Table 6.8. People get

1. High Intake
TABLE 6.8

FOODSTUFF-WISE RANK OF INTAKE IN URBAN AREAS OF UPPER NARANADA BASIN

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Urban Centres</th>
<th>Cereals</th>
<th>Pulses</th>
<th>Vegetables</th>
<th>Milk</th>
<th>Sugar</th>
<th>Oil &amp; Fats</th>
<th>Fruits</th>
<th>Flesh Foods</th>
<th>Accumulated Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mandla</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>Dindori</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>21</td>
</tr>
<tr>
<td>3</td>
<td>Sehora</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>Katni</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>35</td>
</tr>
<tr>
<td>5</td>
<td>Jabalpur</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>24</td>
</tr>
</tbody>
</table>

Source: Based on the Diet Survey. (Rank-1 = Low Intake)
most of the calories from various cereals, because majority of the population is vegetarian.

PROTEIN

Protein is essential for the growth and repair of the tissues of the body and also body defence. It is required more during the period of growth. Additional protein will also be required in different physiological conditions like lactation. In the study region, the highest intake of protein has been reported from Katni i.e. 72.2 gm and lowest from Mandla, i.e. 60 gm per head per day. Average intake is 63.9 gm. It varies from centre to centre. Details of intake are given in Table 6.8.

CARBOHYDRATE

Carbohydrates give energy on which all the activities of life depend. The intake of carbohydrates varies from family to family in different centres. It varies from 401 gm to 517 gm per day per head. The highest consumption is reported in Katni i.e. 517.9 gm and lowest in Mandla i.e. 401 gm per head per day. Details of other centres are given in Table 6.8. The main sources of carbohydrate in the region are mainly sugar and other sweet fruits etc.

CALCIUM

The bones and teeth are made up principally of calcium salts and hence calcium is mainly required as a building
material for strong bones and teeth. The calcium intake is the highest in Katni, i.e. 694.3 mg and lowest in Mandla i.e. 388.8 mg per day per head. Average consumption of calcium is reported below the recommended quantity i.e. 492.8 mg. Details of other centres are given in Table 6.9.

IRON

In India iron deficiency is generally reported among women due to their physiological circumstances. Iron is essential for vital activity of blood and glands which exist principally as haemoglobin in the blood. Iron distributes the oxygen inhaled into the lungs among all the cells. The intake of iron varies from place to place i.e. 21.3 mg to 25.7 mg per head per day. The intake of iron is up to the mark as recommended 20 - 30 mg. Average intake in the region is reported 23.4 mg per day per head. Deficiency in diet is reported due to the less consumption of iron-rich foodstuffs by the people. Sources are limited and consumption found low due to ignorance etc. particularly among women.

VITAMIN A

Vitamin A is present in some animal foods like butter and ghee, whole milk, curd, egg, liver etc. Vitamin A is necessary for eye and skin as also for full growth.

The average intake of vitamin A is 2118 IU, which is very much low as recommended by IOMA. It varies from place to place i.e. 2032.9 IU in Sindori to 2269.8 IU in Katni per
# Table 6.9

Nutrients intake per head per day in the urban areas of Upper Narmada Basin

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Urban centres</th>
<th>Calorie (gm)</th>
<th>Protein (gm)</th>
<th>Carbohydrate (gm)</th>
<th>Calcium (mg)</th>
<th>Iron (mg)</th>
<th>Vitamin A (IU)</th>
<th>Thiamin (mg)</th>
<th>Riboflavin (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dindori</td>
<td>2258.7</td>
<td>64.9</td>
<td>439.8</td>
<td>423.8</td>
<td>23.4</td>
<td>2032.9</td>
<td>1.5</td>
<td>0.6</td>
</tr>
<tr>
<td>2</td>
<td>Jabalpur</td>
<td>2399.6</td>
<td>61.5</td>
<td>454.5</td>
<td>430.8</td>
<td>24.3</td>
<td>2115.0</td>
<td>1.6</td>
<td>0.8</td>
</tr>
<tr>
<td>3</td>
<td>Katni</td>
<td>2749.0</td>
<td>72.2</td>
<td>517.9</td>
<td>604.3</td>
<td>25.7</td>
<td>2269.8</td>
<td>1.7</td>
<td>0.8</td>
</tr>
<tr>
<td>4</td>
<td>Mandla</td>
<td>2107.2</td>
<td>60.0</td>
<td>401.0</td>
<td>388.8</td>
<td>21.3</td>
<td>2043.8</td>
<td>1.4</td>
<td>0.6</td>
</tr>
<tr>
<td>5</td>
<td>Sehora</td>
<td>2318.3</td>
<td>61.2</td>
<td>427.3</td>
<td>526.4</td>
<td>22.5</td>
<td>2628.7</td>
<td>1.5</td>
<td>0.7</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>2366.5</td>
<td>63.9</td>
<td>448.1</td>
<td>492.8</td>
<td>23.4</td>
<td>2118.0</td>
<td>1.5</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Source: Based on Diet Survey.
INTAKE OF NUTRIENTS PER HEAD PER DAY
(URBAN AREA)

A

CALORIE (Kcal.) VITAMIN A (I. U.) PROTEIN CARBOHYDRATE CALCIUM IRON THIAMINE RIBOFLAVIN

Recomended Allowance Actual Intake

ACCUMULATED RANK OF NUTRIENTS INTAKE (URBAN AREA)

B

MANDLA DINDORI SEHORA JABALPUR KATNI

ACCUMULATED RANK

0 10 20 30 40
head per day. The consumption of this vitamin is less than 50 per cent of that recommended by experts. Deficiency of vitamin A reported throughout the region is due to the fact that the region's diet basically depends on cereals.

THIAMINE B\_1

The consumption of cereals which is the main source of Vitamin B\_1 is low. High intake of the vitamin is found in Katni i.e. 1.7 mg and lowest in Mandla i.e. 1.4 mg per head per day. In the Jabalpur district high intake of B\_1 vitamin is reported (Plate 17 A).

RIBOFLAVIN B\_2

The average intake of this vitamin is lowest as recommended i.e. 0.7 mg only per head per day, and the highest reported in Jabalpur and Katni i.e. 0.8 mg. Cereals are the main source of this vitamin. The contents of B group vitamin in these cereals is low.

RANKING OF DIET
NUTRIENTS WISE

LOW INTAKE

The intake of nutrients in Mandla town is very low. Mandla ranks first in calorie, protein, carbohydrate, calcium, iron, thiamin and second in riboflavin.

1. Low intake
TABLE 6.10

NUTRIENTS-RANK OF INTAKE IN URBAN AREAS OF UPPER NARMADA BASIN

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Urban Centres</th>
<th>Calorie (gm)</th>
<th>Protein (gm)</th>
<th>Carbohydrate (gm)</th>
<th>Calcium (mg)</th>
<th>Iron (mg)</th>
<th>Vitamin A (IU)</th>
<th>Thiamin (mg)</th>
<th>Riboflavin (mg)</th>
<th>Accumulated Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mandla</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Binduri</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>Sehora</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>4</td>
<td>Jabalpur</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>27</td>
</tr>
<tr>
<td>5</td>
<td>Katni</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>37</td>
</tr>
</tbody>
</table>

Source: Based on the Diet Survey. (Rank - 1 = Low Intake)
MEDIUM INTAKE

The diet of the people of Dindori, Sehora and Jabalpur towns is reported medium. Dindori ranks third in carbohydrate and iron, fourth in protein, Sehora ranks fourth in calcium and Vitamin A while Jabalpur ranks third in protein, calcium, Vitamin A, thiamin and riboflavin and ranks fourth in calories, carbohydrate and iron.

**TABLE 6.11**

<table>
<thead>
<tr>
<th>Urban centres</th>
<th>Rank</th>
<th>Urban centres</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandla</td>
<td>9</td>
<td>Jabalpur</td>
<td>27</td>
</tr>
<tr>
<td>Dindori</td>
<td>18</td>
<td>Katni</td>
<td>37</td>
</tr>
<tr>
<td>Sehora</td>
<td>21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Lowest figures means highest deficiency.  
Source: Based on Diet Survey.

HIGH INTAKE

Katni holds fifth rank\(^1\) in all the nutrients except Thiamin and Riboflavin. So the intake of the nutrients in Katni is very high (Plate 17 B).

It is clear from the study that the overall picture of availability and intake of different nutrients in the region are not up to the mark. The average per head per day intake of calories is 2287 as reported in the region. The availability of foodstuffs and nutrients and the intake of food-\(^1\) Higher rank means the low deficiency.
stuffs and nutrients are not connected with each other.

NUTRITIONAL LEVEL IN THE AREA

On the basis of the diet survey, the total food stuffs available for the consumption of the people of study area is to be taken into account to assess the nutritional level. As cereals are almost the only item of diet of the people of the basin and usually meat, fish and eggs are not commonly consumed, the calories and proteins are obtained from cereals only. However, the diet survey carried out by the author in the selected villages and urban centres of the region shows that the diet of a considerable proportion of the population is inadequate, both quantitatively and qualitatively. So the average diet of the region is under-nourished as well as malnourished.

UNDER NUTRITION AND MALNUTRITION

One out of every two Indians suffers either from under nutrition and/or malnutrition or both.¹ Malnutrition mainly occurs due to lack of vitamins and minerals in the diet, while generally speaking under-nutrition occurs where the diet is found deficient in calories.

The diet of selected families of study area is not satisfactory in all respects as far as intake of various

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nutrients are concerned. Deficient diet in respect of calories, proteins, minerals and vitamins will not give proper resistance power to the body, thus creating favourable environment for the occurrence of diseases and ill-health conditions. Lack of stamina is responsible for low production which leads to poverty. We can say that the diet is that barometer by which physical and mental activities of the people will be measured.

In the study area (as shown in Table 6.12) malnutrition is widely spread and it is due to inadequate intake of nutrients and may be due to faulty selection of foods, low purchasing power, ignorance and availability of poor food-stuffs. On the basis of diet survey conducted by the Scholar it is observed that main sufferers from malnutrition are children. It is also observed in large families.

The above information shows that the people suffer from both under-nutrition and malnutrition. Particularly, malnutrition and its bad effects can be clearly seen in many families of the region, and it is responsible for hampering physical and mental growth of the children and adults. It also serves as the basic reason for serious illness of the people. It is also the main cause of poverty.

Calcium, iron, Vitamin A and Vitamin B group are found quite deficient in the diet of the region, which may be responsible for the various ill-health conditions reported in the study region.
RURAL AREA I: NUTRITIONAL LEVEL

The people of rural areas are basically dependent on agriculture and their food is directly dependent also on local produces. So the dietary habits of the rural people are very much related to the local food.

Malnutrition and under-nutrition both are found in the diet of the rural area. An attempt has been made in Table 6.12 to show the per head per day consumption of various nutrients together with their actual position from the standard requirements. The actual intake of calorie, which is most essential for the human body, is only 2207 as against the standard requirement of 2700. It means that the diet of the rural people is quite deficient in respect to their calorie intake. Rural women require more calories and nutrition because they do heavy work outside the home also. In the rural diet, deficiency reported is 493 calories, 444.1 mg of calcium, 7.4 mg iron, 3046.4 IU vitamin A and 1.8 mg of Riboflavin.

The actual intake of Vitamin A is quite deficient. This is essential for the growth and development of the body and for the orderly progress of the nutritional process at all ages.

The supply of protein in the area 1.1 gm, reported deficit is due to the rural people being fully dependent on the cereals. Besides, the protein deficiency is reported in the children and women in the study area. As a matter of
<table>
<thead>
<tr>
<th>Nutrients</th>
<th>Standard Requirement</th>
<th>Actual Intake Rural Area</th>
<th>-Deficiency +Surplus</th>
<th>Actual Intake Urban Area</th>
<th>-Deficiency +Surplus</th>
<th>Actual Intake Upper Narmada Basin</th>
<th>-Deficiency +Surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calorie</td>
<td>2700&lt;sup&gt;1&lt;/sup&gt;</td>
<td>2207</td>
<td>(-)593</td>
<td>2367</td>
<td>(-)433</td>
<td>2287</td>
<td>(-)513</td>
</tr>
<tr>
<td>Protein (gm)</td>
<td>55 - 65</td>
<td>64</td>
<td>(-) 1</td>
<td>63.9</td>
<td>(-)1.1</td>
<td>63.9</td>
<td>(-)1.1</td>
</tr>
<tr>
<td>Calcium (mg)</td>
<td>1000</td>
<td>555.9</td>
<td>(-)444.1</td>
<td>492.8</td>
<td>(-)507.2</td>
<td>524.4</td>
<td>(-)475.6</td>
</tr>
<tr>
<td>Iron (mg)</td>
<td>20 - 25</td>
<td>22.6</td>
<td>(-)2.4</td>
<td>23.4</td>
<td>(-)1.6</td>
<td>23.0</td>
<td>(-)2.0</td>
</tr>
<tr>
<td>Vitamin A (IU)</td>
<td>5000</td>
<td>1953.6</td>
<td>(-)3046.4</td>
<td>2118.0</td>
<td>(-)2882</td>
<td>2035.8</td>
<td>(-)2964.2</td>
</tr>
<tr>
<td>Thiamine (mg)</td>
<td>1.5 - 2.0</td>
<td>1.7</td>
<td>(+) 0.2</td>
<td>1.5</td>
<td>00</td>
<td>1.6</td>
<td>(+) 0.1</td>
</tr>
<tr>
<td>Riboflavin (mg)</td>
<td>2.5 - 3.0</td>
<td>0.7</td>
<td>(-) 1.8</td>
<td>0.7</td>
<td>(-) 1.8</td>
<td>0.7</td>
<td>(-) 1.8</td>
</tr>
</tbody>
</table>

Source 1: Based on various ICMR Reports and the Diet Survey.
1. Average of recommended allowances for various groups.
fact, the daily requirement of protein for an adult is about 1 gm per Kg. body weight, and in children because of their active growth, it is higher and may require 2 to 3.5 gms per Kg. body weight. The protein supply for adults is quite upto the mark, but for the children, supply is not satisfactory. They require high amount of protein per head per day. Therefore, the protein deficiency is reported in the study area among the children.

URBAN AREA : NUTRITIONAL LEVEL

The diet of the urban places is also not found upto the mark. Deficiency of nutrients to some extent is found particularly in the lower class families in the urban centres.

In the urban area malnutrition and under-nutrition both have been shown in Table 6.12. The per head consumption of calories is 2367 as against the standard requirement. Calcium, Iron, Vitamin A and Riboflavin fall short of the standard requirement by 507.2 mg, 6.6 mg, 2882 IU and 1.8 mg respectively, while protein and Thiamine are present sufficiently in the diet. Calcium is reported to be highly deficient in the diet of the urban people.

So, malnutrition should be differentiated from under-

nutrition as the rural people suffer not so much due to shortage of food, but due to faulty food habits, and also due to the conditions arising from social and cultural factors. The chief cause of the constitutional deterioration of our state of health at present is to be found in the defective diet of civilised nations causing malnutrition.