

**INTERNATIONAL COOPERATIVE ALLIANCE**

# BALANCED DIET

**Bina Poplai**



**INTERNATIONAL COOPERATIVE ALLIANCE**  
Regional Office and Education Centre for South-East Asia  
43, Friends Colony, Post Box 639, New Delhi-14, India

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B A L A N C E D      D I E T

Mrs Bina Poplai  
B.A. Dip.(Home Sciences)  
Diploma in Teachers' Training  
M.Sc. (Education & Extension)  
Lecturer in Food  
LADY IRWIN COLLEGE, NEW DELHI.1

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## F O R E W O R D

One of the recommendations of the Seminar which the International Cooperative Alliance had organised, in collaboration with the UNESCO, on the 'Role of Cooperation in the Emancipation of Women' in 1962 in New Delhi, was that the ICA should undertake a survey on the extent of participation by women in Cooperative Movements of South-East Asian countries. On behalf of the ICA, this task was accomplished by a Cooperator from Pakistan. The Survey brought together a large amount of factual information, highlighted the major problem areas and provided a broad framework within which the future work programme of the ICA Regional Office in the field of women and cooperatives could be developed. Ever since the completion of the Survey, the office has given sustained attention to collecting and bringing upto-date information on the subject and has arranged for its exchange within the Region as also, through the ICA Headquarters in London, with the rest of the world.

One of the most fruitful areas of cooperative activities in which the contribution of women remains vital is that of consumer cooperation. In the context of our intensive work in the field of cooperative education, it has been our feeling that education programmes must be comprehensive in approach and must cover a broad enough area to be of direct interest to members. A too narrow emphasis on cooperative principles, ideology, laws and practices, is likely to create an interest in members which could only be temporary. Thus, for instance, when educational campaigns are directed towards women, it is absolutely essential that problems of household economy, hygiene and dieting are brought within the scope of educational material. The present document on "Balanced Diet" is our first attempt in the Region to produce suitable literature particularly for women members of consumer cooperative societies.

The booklet was conceived by our Woman Assistant, Mrs Margaret D' Cruz, and was written, at the initiative of the International Cooperative Alliance, by Mrs Bina Poplai of the Lady Irwin College of Home Science, New Delhi. I sincerely hope that this document, which reflects the wider concern of the Cooperative Movement towards a problem so vastly encountered in South-East Asia, will be of use to Cooperative organisations as study material for educational programmes for women.

The views expressed in the booklet are entirely those of Mrs Poplai.



S. K. Saxena

New Delhi,  
May 29, 1968.

Regional Officer for S-E Asia

B A L A N C E D      D I E T

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## INTRODUCTION

Food is the main necessity of life, and for that reason alone it merits serious and detailed consideration. With the growth of population and social changes, conditions have arisen which make the greater understanding of food imperative. Importance therefore has to be given to its different aspects like production, storage, distribution and consumption. To get the maximum benefits proper standards have to be set and maintained at all levels from the farm to the table.

With the progress in scientific research and technology, a great deal of useful information has been obtained in the field of food and nutrition. It has been established that a nutritionally adequate diet is essential for maintaining the body in good health and increasing physical efficiency. The importance of making known to the masses, specially to the housewives this basic scientifically established fact along with other findings in the field of food and nutrition has been recognised by international bodies like the FAO, WHO and UNICEF, and others who are specially interested in improving the diets of the vulnerable groups like children, expectant and nursing mothers.

Data on food surveys and nutritional status has shown that most of the countries in South-East Asia are suffering from under-nutrition. Besides this protein deficiency of iron, vitamin A, riboflavin, thiamine are also quite common in a majority of the population in these countries.

In order to improve the existing food conditions the masses need to be educated and made conscious of their faulty food habits. Therefore, the knowledge of dietary requirements for individuals, the right proportions and sources of various components should be made available in the simplest form, especially to the housewives so that food standards may improve.

### Food and Human Body

Scientific investigations have been carried out on food to determine its relationship with and effect on the human body. As a result of these investigations the following facts have been established :

a) Food can be divided into seven major constituents:

- (i) carbohydrates
- (ii) fats
- (iii) proteins
- (iv) minerals
- (v) vitamins
- (vi) water
- (vii) roughage

b) No one food constituents alone has the ability in itself to maintain the body in good health, for example, though proteins are essential for body building and repair of tissues, a diet consisting only of proteins cannot compensate for the lack of other essential food constituents.

c) Different foodstuffs have different values in terms of calories§.

§ What is a calorie? When the food we eat is assimilated or absorbed by the body, it produces heat. This heat in turn gives energy to the body. Energy is the power to do work.

Just as we measure our height in feet and inches, or our weight in kilograms and grams, so also this energy is measured in terms of calories. A calorie is, therefore a unit of measure for the energy provided to our

This means that a small quantity of one type of food may give the same number of calories as a large quantity of another type of food. In other words, equal quantities of different types of foodstuffs yield different amount of calories. For example, one gram of fat gives nine calories of energy whereas one gram of carbohydrates or proteins give only four calories.

Calorie requirements of people in different age groups for normal health is given in the graph. The function of food is to supply the body with certain dietary essentials which are necessary for the growth, maintenance, repair and proper functioning of its different parts. Therefore, it is important that we try to find those foods and the right quantities of such foods which are essential for healthy growth and maintenance of the human body.

Foods can be functionally divided into three main groups :

1. Body building foods : These are rich in proteins. Meat, fish, poultry, milk and pulses are some of the foods rich in proteins.
2. Energy giving foods : These are rich in fats and carbohydrates. Cereals, sugars and oil are some of the energy giving foods.
3. Protective foods : These are rich in minerals and vitamins. Milk, eggs, green leafy vegetables and fruits are some of foods which are rich in minerals and vitamins.

Food constituents and their sources are given in the table on page

§ body by food. All foods that we eat give the body some calories (energy). The number of calories (or the amount of energy) given to the body by different foods is different, some foods give more than the others. A chart showing the calories provided by different foods is given elsewhere in this booklet.



## FOOD CONSTITUENTS

### Proteins

Proteins are the main constituents of body cells and form the major part of muscles and tissues. As pointed out earlier all foods yield some calories. Calories obtained from protein foods are an important contribution to the daily requirement of calories in the body. The calories obtained from protein foods, help in the building and repair of tissues which the calories obtained from other sources are unable to do.

### Functions of proteins

Proteins not only promote the growth but help build and repair body tissues. They are also essential for the production of metabolic and digestive enzymes, hormones and blood proteins. They help in healing body wounds and also build resistance to certain diseases.

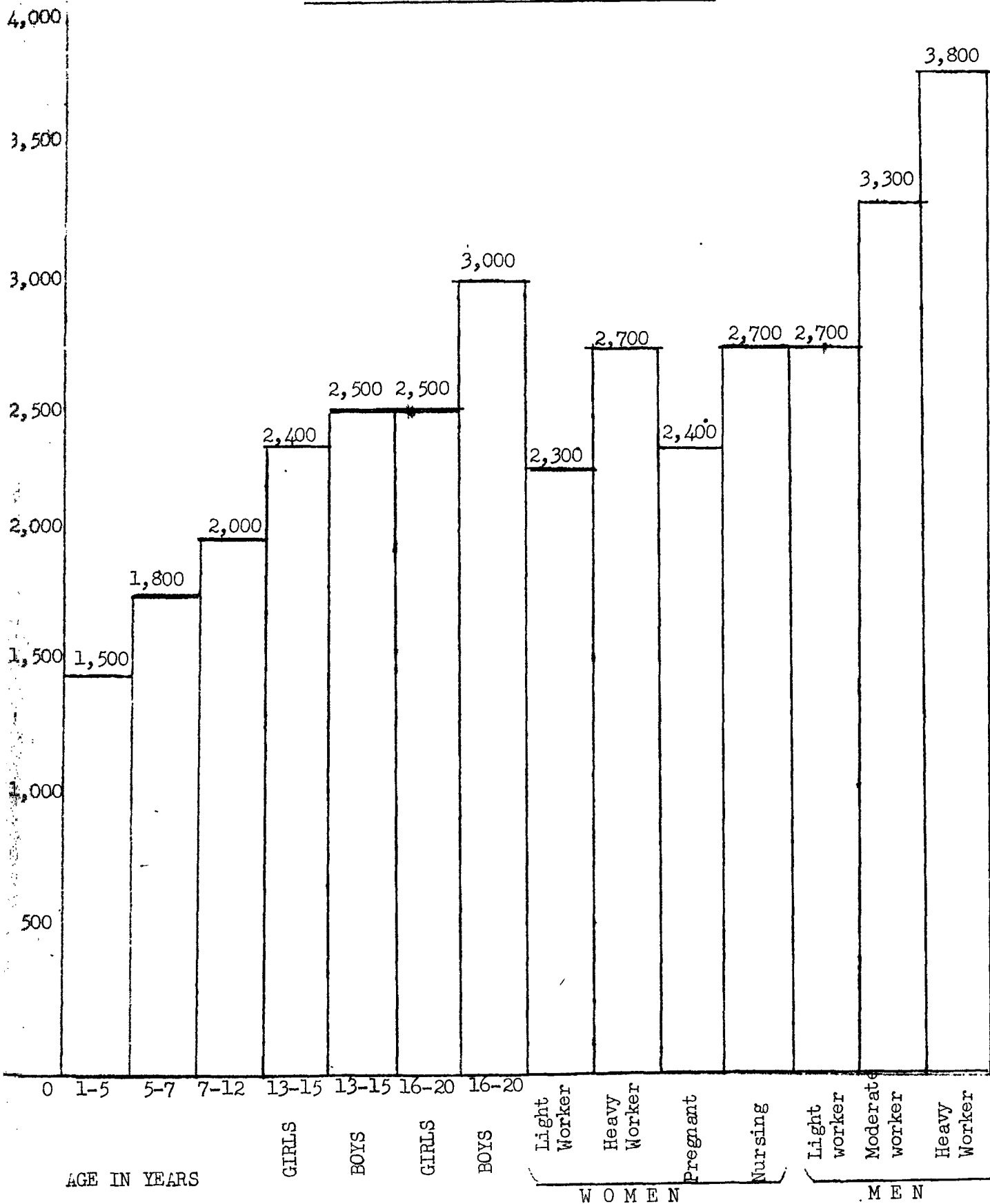
Proteins are complex substances made up of certain amino-acids. There are 23 amino-acids and different combination of these amino-acids give rise to different types of proteins.

Out of these, there are 8 amino-acids which are essential to our diet. These are not found in all the protein food.

### Types of proteins

- a) Complete proteins : The proteins obtained from animal sources meat, fish, eggs, cheese and milk, are said to be complete proteins as they contain these essential amino-acids.
- b) Incomplete Proteins : Proteins from vegetable sources such as dals, cereals, nuts etc. have some of these essential amino-acids only and are therefore called incomplete proteins.

CALORIC REQUIREMENT



### Assimilation (or digestion) of proteins

The body breaks up these proteins, which are taken from different foods that we eat, into simpler substances i.e. amino-acids. These are dissolved in water (amino-acids are soluble in water) and are carried into the blood stream thus circulating throughout the body and helping the repair and replacement of tissues where necessary. The extra amino-acids, if any, which are not needed for repair and replacement of tissues are broken down, and the end products are excreted by the body.

### Protein requirements

Just as the calorie requirements of different individuals vary, the protein requirements too vary according to age, sex, activity and the state of health. At the same time a combination of proteins from both animals and vegetable sources are far more desirable for healthy living, than relying upon only one source of proteins.

### Important sources of proteins

The table below shows the proteins (in gms) obtained from 100 gms. of the food listed.

<u>Foods (in 100 gms.)</u>	<u>Approx. Protein yield (in gms.)</u>
Milk (from different sources)	3 - 4
Milk Powder (whole and skimmed)	25 - 38
Eggs	12 - 13
Fish, meat and liver	18 - 21
Cereals (Ragi, Barley, Bajra, Maize, Jowar and Millet)	7 - 12
Wheat	11
Rice (Home pounded/Milled)	7
Soya beans	43
Pulses	19 - 28

### Protein deficiency

In infants and in pre-school children protein deficiency results stunted growth, anaemia, dry hair and skin, diarrhea and sometimes an enlarged liver. It also reduces resistance to infection, and therefore, recurrent attacks of infections and infestations are common in protein deficient children. The pictures at "A" and "B" shown in the Illustration Section show a child suffering from protein deficiency.

In adults the deficiency symptoms are not very marked. Deficiency results in loss of body weight and the body's resistance to diseases is also reduced.

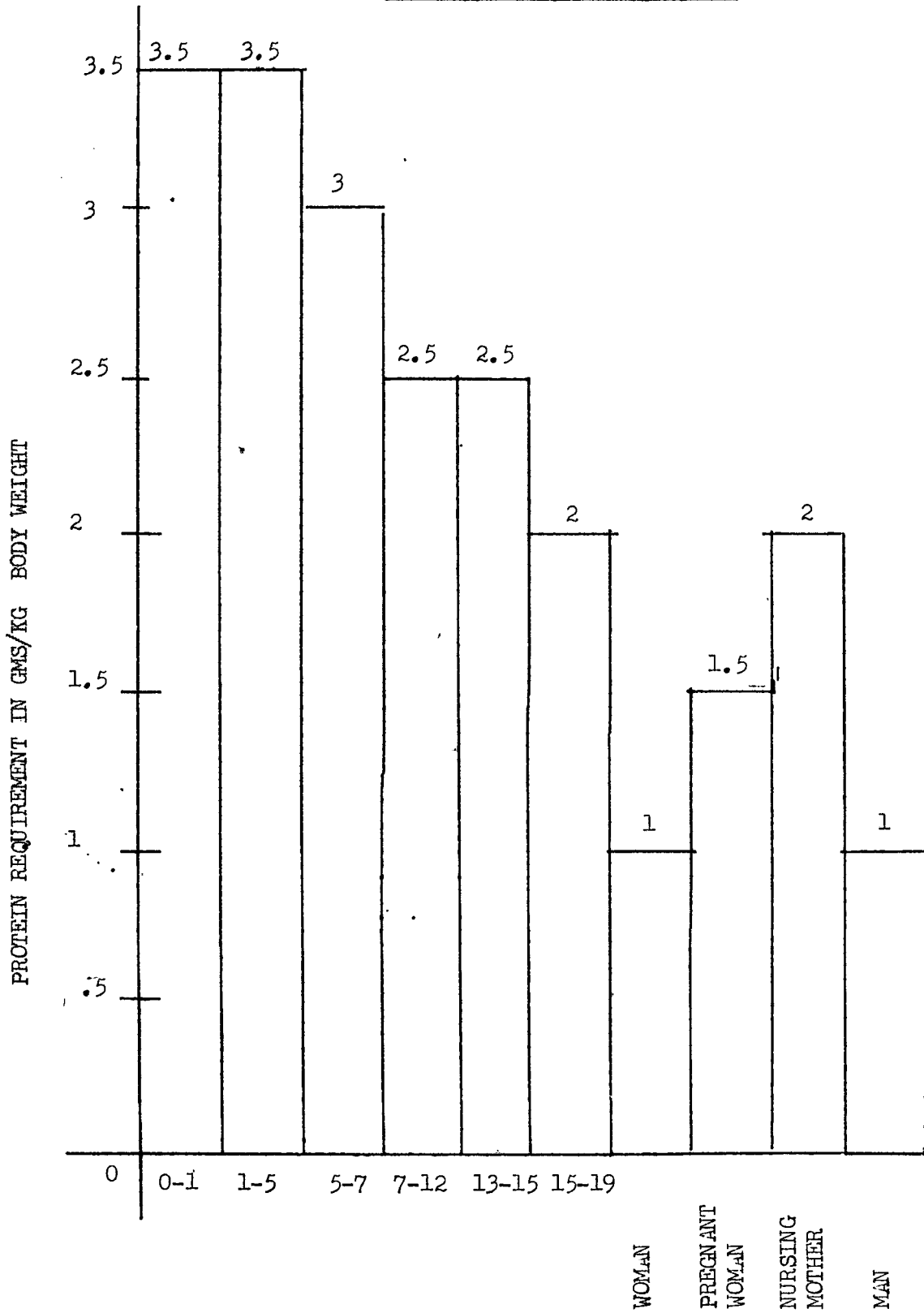
There are some basic or minimum requirements of proteins, that an individual requires to stay in a state of good health. These minimum requirements vary with different countries. Highly developed countries like U.S.A. and U.K. have a higher minimum requirements than countries like India, China and Pakistan.

The protein requirements at different ages is shown in the following table

### Assimilation check

1. Why are proteins important in our diet at different ages ?
2. Why are proteins classified as complete or incomplete proteins ?
3. What are the ill effects of proteins imbalance in the body ?

P R O T E I N   R E Q U I R E M E N T



AGE IN YEARS

CHAPTER II  
CARBOHYDRATES

Carbohydrates are an important constituent of our food. The proportion of calories derived from carbohydrates in the diet is the highest because they form the bulk of the diet. Foods like cereals, pulses, sugar jaggery, honey and some vegetables like potatoes are sources of carbohydrates.

Carbohydrates give a quick supply of energy and if taken in excess the extra amount is converted into fat, and can be stored in the body.

Requirements of carbohydrates

In a balanced diet, carbohydrates provide about 60 to 70 per cent of the calories. In the lower income groups, as much as 80 per cent of the caloric requirements are met by carbohydrates.

Sources of carbohydrates

The table below shows the carbohydrates (in gms.) obtained from 100 gms of foods listed.

Foods (100 gms )	Yield (in gms)
Sugar, Jaggery and Honey	79 - 99
Sago and Arrowroot	83 - 87
Rice (Raw, Milled and Home pounded)	76 - 79
Wheat flour -(Maida)	71 - 74
Pulses	55 - 60
Bajra, Barley, Jawar, Maize and Ragi	63 - 73
Potatoes and sweet potatoes	23 - 31
Tapioca	85
Fruits like Dates, Raisina, Prunes and Figs	67 - 77
Fresh fruits	15 - 25

FATS

All types of fats, including oils, produce twice as much energy in the body as is done by similar quantities of either carbohydrates or proteins. They therefore have a higher caloric value. Since fats take a longer time to be assimilated, the energy produced by them is gradual and sustained. Fats also help the fat soluble vitamins to be carried in the food. There are no obvious ill effects due to deficiency of fats, but if it is prolonged, dryness of skin results and indirectly the supply of certain fat soluble vitamins like D & K will be effected.

Excess of fat in the diet causes more problems than its deficiency. Digestive troubles and obesity are amongst the most common ones. (See picture "C").

Fat contents of some foods are given below :

Foods (100 gms)	Yield (in gms)
Ghee - Coconut oils, Mustard Oils	100
Butter	.80
Nuts like Almonds, Groundnuts, coconut (fresh and dry)	40-65
Soya beans	20
Milk and milk products	4-32
Eggs and meat	13
Liver	7.5
Fish (different types)	1.5 - 10.5

MINERALS

Minerals are another important constituent of our food. They regulate and help the body maintain good health. Minerals needed in the

body are calcium, phosphorus, iron, iodine etc. The deficiency of these in the body leads to deficiency diseases, like, rickets, anaemia, and goitre.

#### Functions of calcium

It is specially needed for young and growing children to build strong bones and teeth, and to help them to grow. Calcium deficiency along with vitamin D deficiency in the body results in the stunting of growth, rickets, deformed and brittle bones and bad teeth. Women especially suffer from a deficiency disease called osteomalacia which may lead to deformity of pelvis bones. Calcium deficiency also prevents the blood from clotting which can be extremely dangerous in cases of accidents or excessive bleeding. (See picture at "D").

#### Sources of calcium

Calcium for our daily requirement can be obtained from milk, cheese, curds, eggs, green leafy vegetables including the stems, ragi, pulses, nuts etc.

Growing children, expectant and nursing mothers require an extra intake of calcium.

#### Phosphorus

Closely associated with calcium is phosphorus, which is present in plant seeds. Rice dals, meat, fish, eggs, and nuts are also good sources of phosphorus.

#### Iron

Iron helps to carry oxygen to tissues through the blood and helps in tissue respiration. In a new born infant there is a store of iron which can last for approximately 4-6 months, and unless iron is introduced into the baby food early enough the child may exhaust its reserve and start showing signs of anaemia. In children and adults, iron deficiency



leads to anemia. (See picture at "E")

#### Sources of iron

Cereals like Bajra, Ragi, Rice, Wheat and Jawar and Pulses, SK Soya beans, nuts and oilseeds, green leafy vegetables, jaggery, meat, eggs and liver are rich sources of iron.

#### Iodine

Iodine is an important constituent of the thyroid hormone. Its deficiency results in goitre, which is usually common in hilly or mountain areas, where the soil is almost devoid of Iodine. (Refer to photo at "F")

#### Sources of Iodine

Common salt from seawater and sea fish are the richest sources of iodine.

#### Assimilation check

1. What are the ill effects of consuming excess or less of fats in the daily diet ?
  2. What deficiencies are caused by the imbalance of calcium, iron and iodine in the body. ?
-

## CHAPTER III

VITAMINS

Vitamins are very necessary for maintaining the body in good health. They are referred to by letters such as A,B,C,D and so on. Each of these have different function to perform in the body. Vitamins may be classified under two headings -

- (a) Fat soluble - eg. Vitamin A, Vitamin D and Vitamin K & E
- (b) Water soluble - eg. Vitamin C or Ascorbic acid, Vitamin B complex :
  - i) Thiamine or Vitamin B<sub>1</sub>
  - ii) Riboflavin - Vitamin B<sub>2</sub>
  - iii) Niacin
  - iv) Folic Acid
  - v) Vitamin B<sub>12</sub>

General uses of vitamins (in the body)

The individual vitamins have special functions to perform in a body, but collectively as a group their functions can be divided into :

1. the promotion of body growth;
2. the promotion of the ability to produce healthy children;
3. the maintenance of health and vitality through :
  - a. normal functioning of the digestive tract
  - b. nervous stability
  - c. resistance to infection.

How to obtain enough of Vitamins in the daily diet

In order to increase the vitamin content of the diet, large quantities of whole milk, whole grains, green leafy vegetables, citrus and other fruits, butter or margarine, eggs, meat, fish, poultry and sprouted grains should be taken.

Different types of Vitamins, their sources and the deficiencies resulting from the lack of these vitamins are given in the table below.

VITAMINS	SOURCES	DEFICIENCY
<p>1. Fat soluble Vitamin A</p>	<p>Many marine fish oils, especially liver oils have high concentrations. Eggs, milk, cheese and green leafy vegetables are good sources.</p>	<p>1. Growth - retarded  2. Epithelial tissue - keratinization of epithelium.  3. Eyes - i) Night blindness or nyctalopia - prolonged dark adaptation time.  ii) Xerosis and keratomalacia inflammation and discharge from eyes.  iii) Xerophthalmia - ulceration and blindness ensues.  4. Skin - lesions - dryness and roughness  5. Bones and teeth - growth impaired.  6. Infections - body more susceptible to infections.</p> <p><u>Hypervitaminosis A</u> - in acute phase - head ache, nausea, vomiting, drowsiness - dry itchy skin; cracking of lips and painful areas over various bones.</p>
<p>2. Vitamin D or Anterachiatric</p>	<p>Fortified milk, cod liver oil and many synthetic preparations. Milk contains insignificant amounts. Grains and vegetables still less. Butter and liver have small quantities. Fish liver oils rich sources.</p>	<p>1. Growth retarded.  2. Rickets in children - enlargement of ankle, knee and wrist joint, bowed legs, loeading or ribs (rachitic rosary) and delayed tooth eruption.</p> <p><u>Hypervitaminosis D</u> - increased blood 1 levels of Ca and P.  Calcification of variety of tissues</p>
<p>3. Vitamin K</p>	<p>Hog liver very rich, egg yolk - low Hempseed - excellent source. Green leafy vegetables are fair sources.</p>	<p>Infrequent in higher animals as synthesised by intestinal bacteria. Leads to prolonged clotting time and internal haemorrhage.</p>

VITAMINS	SOURCES	DEFICIENCY
<p>4. Vitamin E</p>	<p>Vegetable oils like wheat germ oil has highest concentration. Corn oil and cotton seed oil are also good sources. Lettuce is a good source as also green leafy vegetables. Of animal tissues liver is highest in Vitamin E.</p>	<p>Deficiency symptoms not well established in man, but leads to -</p> <ol style="list-style-type: none"> <li>1. Muscle dystrophies</li> <li>2. Habitual abortions</li> </ol>
<p>II. <u>Water soluble</u> vitamins Vitamin C Ascorbic acid.</p>	<p>Distributed rather widely in nature. Important dietary sources include many vegetables and fruits. Fresh vegetables such as broccoliparsley and turnip have high content. Citrus fruits are excellent sources.</p> <p>Certain vegetables constitute an important source by virtue of the amounts eaten rather than due to high level of vitamins e.g. potatoes, beans and peas. Animal products contain small amounts.</p> <p>Guava is an excellent and cheap source of vitamin C.</p>	<p>Deficiency leads to scurvy - failure to deposit intercellular cement substances e.g. collagen of vascular tissues - hemorrhage, scorputic bone-weak and fractures easily. In children - tenderness and smelling of joints, some degree of apathy and pallor and desire to remain quite motionless. In adults - lossening or even loss of teeth, sore and spongy gums, internal hemorrhage, subentaneous hemorrhage upon mild injury, painful joints, edema and anemia and loss of weight.</p>
<p>ii. Vitamin B complex ii. Thiamine or Vit. B<sub>1</sub>.</p>	<p>Widely distributed in both plants and animal tissues. In plants - seeds contain highest. Dry peas, beans and soya beans are excellent sources. Vitamins are concentrated in outer layers of grain kernels - Bran and rice polishings are good sources.</p> <p>Whole wheat bread and white bread are good. Yeast an outstanding source. Many nuts like peanuts and prazil nuts are a</p>	<p>1. Beriberi women - early symptoms are loss of appetito, lassitude, and loss of weight. Later on the nervous system is affected and leads to paralysis.</p>

VITAMINS	SOURCES	DEFICIENCY
iii. Riboflavin.	<p>good source. Also milk is important dietary source due to large quantities consumed through it. Cheese, gooseberries and dried prunes are good sources and animal tissues are excellent sources.</p>	<p>1. Inflammation of tongue - glossitis - magenta colour and flatterring of papillae.  ii. Cheilosis - fissuring at the corners of mouth and lips.  iii. Seborrhic dermatitis - sharp like appearance of skin in the nasolabial folds.</p>
iv. Niacin	<p>Widely distributed in both plant and animal tissues. Animal organs - liver, kidney and heart and lean meat. Some fish are outstanding sources, also yeast, peanuts, wheat germs, and dried legumes are rich sources. Fresh legumes and few green vegetables are good sources whereas milk, eggs and most fruits are poor.</p>	<p>1. Pellagra - a. dermatitis accompanied by pigmentation.  b. Diarrhoea.  c. Dementia - nervous lesions.</p>
v. Folic acid	<p>Green leafy vegetables and yeast are good sources. Grams are also good sources.</p>	<p>Difficult to produce unless intestinal bacteria inhibited. Deficiency leads to anaemia.</p>
v. Vitamin B <sub>12</sub>	<p>Plants do not contain B<sub>12</sub>. Liver, kidney excellent sources. Animal and fish muscle contains - moderate quantities while vegetables and grains contain little or no vitamin.</p>	<p>Plants and grains contain little or no vitamin.</p>

## CHAPTER IV

THE SEVEN BASIC FOOD GROUPS AND BALANCED DIET

In the preceding chapters we have briefly discussed the essential nutrients with their sources and the ill effects of their absence on the human body. All foods with their sources and contribution to nutritional needs can be assigned a definite place in the Balanced diet depending on their relative importance.

This concept has been interpreted as 'Basic Seven Food Groups' by the Bureau of Human Nutrition and Home Economics, United States Department of Agriculture. This interpretation proved extremely useful in the teaching and learning of nutrition and in the study of food habits. It has also helped tremendously in simplifying the difficult task of meal planning which is discussed in this chapter.

A balanced diet is one that has all the important constituents of food, discussed earlier, in sufficient amounts so as to meet all the body's needs. This can be achieved by eating a variety of foodstuffs. Greater the variety in food, better are the chances of our eating an adequately balanced diet. However it is not sufficient to eat a variety of foodstuffs unless they contain correct and sufficient amount of different essential constituents. A correct combination of different amounts of food will give best results in proper growth, repair and maintenance of body tissues.

Experts on Nutrition have given us the 'optimum' dietary standards both for calories and other food constituents. The scientific method by which the calorie and other food requirements can be calculated is based on certain factors like age, sex and activity. An average labourer, for example doing hard work requires 3000 calories as compared with an adult of the same age doing sedentary work like that of an office clerk or a

teacher, who may require only about 2600 calories per day.

Surveys on dietary habits reveal that the diet of most people, rich or poor in South-East Asia is ill-balanced and certain important food factors that are essential for good health are either not present or are insufficient. This is partly due to lack of knowledge of nutrition. People are not aware of what they should eat and how best they can make use of the food stuffs that are available. Nutrition education therefore, has a very important part to play.

The daily requirements of calories and proteins at different ages are given in the table below, based on the recommendations of the Nutrition Advisory Committee of the Indian Council of Medical Research, India.

Age	Calories	Proteins
1 - 5 years	1000-1200	35 - 45 gms
5 - 10 "	1200-1700	45 - 60 "
10 - 12 "	1700-2000	60 - 70 "
<u>Growing boys and girls :</u>		
13 - 16 years : Girls	2400	70 - 75 "
Boys	2500	70 - 80 "
17 - 20 "       Girls	2500	80 "
Boys	3000	85 "
<u>Women (Normal height, weight)</u>		
Light and moderate worker	2100-2500	65 "
Hard worker	2500-3000	65 "
Pregnant	2100-2400	80 - 90 "
Nursing mother	2700	90 -100 "
<u>Man</u>		
Light and moderate worker	2400-3000	70 "
Hard worker	3000-3500	70 "
Very hard physical worker	3500-3800	70 "

If a house-wife knows the daily requirements for the family members and the food-values of some of the foods that are available it is easy for her to adjust the family menu according to the needs and her budget through rational buying and proper substitutions. Some of the cheaper foods are just as nutritious if not more than the expensive ones and could be easily substituted for them. The following tables gives some of the food constituents and their sources :

Important food constituents and their sources

<u>Constituents</u>	<u>Sources</u>
Proteins :	Eggs, milk, meat, fish, wheat, milled rice, ragi, maize jawar, bajra whole, bengal gram dal, black gram dal, green gram dal, red gram dal, coconut, ground-nut, soyabeans.
Carbohydrates :	Sugar, jaggery, honey, sago, arrowroot, rice, wheat, maize, bajra, barley, pulses, potatoes, tapioca, dates, figs, prunes, raisins, fresh fruits.
Fats :	Ghee, butter, vegetable oils, soya beans, milk, milk products, fish, eggs, meat liver, almonds, coconut, ground-nut, walnuts, pistachionuts.
Vitamins :	Milk, fish, eggs, fish oils, butter, green peas, spinach, carrots, cheese, cabbage, green leafy vegetables, mango, papaya, tomato, apricots, prunes.
Vitamin A.	
Vitamin B.	Milk, meat, liver, eggs, wh t, rice, ragi, grams, pulses, cheese, nuts, lettuce, cabbage, spinach, pumpkin, tomatoes.
Vitamin C.	Amla, orange, lemon, citrus fruits, sprouted pulses, tomatoes, unboiled milk, guava, strawberry, spinach, cabbage, drumsticks.
Vitamin D.	Milk, fish, fish oil, butter, eggs.
Minerals :	
Calcium	Milk and Milk products, ragi, bengal gram dal, black gram dal, green gram dal, red gram dal, green leafy vegetables, almonds.
Phosphorus	Milk and milk products, egg, fish, mutton, liyer, bajra, barley, maize, ragi, rice, wheat, pulses, soya beans, almonds, groundnut, coconut.
Iodine	Common salt prepared from sea water, sea fish and fish oil.



Iron           Wheat, rice, ragi, jawar, bajra, soya beans, pulses, jaggery, nuts, green leafy vegetables, egg, fish, liver, meat.

### Malnutrition and under-nutrition

As a result of surveys of food habits amongst different sections of people in south east asia, it has been observed that the food consumed by a large majority of people in this region is lacking both in quality and quantity. This is particularly true of the low-income groups. Therefore, malnutrition and undernutrition are very common.

The effects of deficiency of different nutrients have already been discussed under their individual headings. The majority of people in South-East Asia are suffering from deficiencies of Protein, Iron, Vitamin A, Riboflavin and Thiamine.

A great deal of work has been done to find ways and means of incorporating these deficient nutrients into the food of the common man. A good example may be cited from India. In India foods like milk, eggs, meat, fish and cheese are comparatively expensive. A large majority of Indians are vegetarians. To meet the need of making available a comparatively cheap source of nutritive food, in India a specially formulated multi-purpose flour (M.P.F.) is being developed. This flour is made of groundnut flour, bengal gram flour, skimmed milk powder and enriched with vitamins and minerals. The protein content of M.P.F. is approximately 40% to 45%. The acceptability of M.P.F. has been tested on a large scale and it has been seen that up to 25% of M.P.F. can be used in combination with other cereals to make up for the deficiency of important food constituents without changing the food habits. Some recipes using M.P.F. are given in the recipe section.

Under-nutrition occurs when the overall food intake is not sufficient.

In this case there is a general deficiency of almost all the important constituents of food and under nutrition and the resultant deficiencies can be observed in varying degrees. In an adult, prolonged under nutrition will result in continuous loss of body weight and general weakness of the body.

In children, during their growing age, constant under-nutrition will result in stunted growth and loss of weight. Prolonged under-nutrition also results in general lack of vitality and mental backwardness in children.

The problem of malnutrition as also of under nutrition can be met only through planned efforts. Since this is an enormous problem it needs the efforts both of the public as well as the governments. The public needs to be made more conscious, through education, of what they eat, what they should eat and how to substitute inexpensive but nutritious foods for the expensive ones. Governments can conduct surveys and find out the areas where foods lack some particular type of constituent and then make available such foods which are rich in all constituents at low cost, at the same time educating and encouraging the public through different media to accept these nutrient - rich foods.

### Obesity

There are three main causes of obesity :

- i. Over-eating
- ii. Lack of exercise
- iii. Defective hormonal activity.

Just as under-eating causes certain problems, over-eating also causes serious ill effects. As a result of over-eating the excess food consumed (more than that required by the body) is converted into fat and deposited as body fat. This fat sometimes acts as a reserve source of

energy in case of starvation. Obesity leads to certain diseases like high blood pressure, and diabetes. However the excess fat is unhealthy and causes obesity and it has been seen that the life span of obese person is less than that of a normal person.

There is a close relationship between body weight and height. A chart showing the relationship of height to weight is given below. Excess weight can be cut down by reducing the calorie intake and by physical exercise.

THE NEW AVERAGE WEIGHT FOR MEN

Height	Weights : (in lbs)			
	Age 30-39	40-49	50-59	60-67
5 ft. 2"	137	140	142	139
5 ft. 4"	145	148	149	146
5 ft. 6"	153	156	157	154
5 ft. 8"	161	165	166	163
5 ft. 10"	170	174	175	173
6 ft.	179	183	185	183
6 ft. 2"	188	192	194	193
6 ft. 4"	199	203	205	204

THE NEW AVERAGE WEIGHT FOR WOMEN

5 ft.	120	127	130	131
5 ft. 2"	126	128	136	131
5 ft. 4"	132	140	144	145
5 ft. 6"	139	147	152	153
5 ft. 8"	146	155	160	161
5 ft. 10"	154	164	169	Insufficient statistics

These weights are with normal clothing (not winter) and with flat shoes.

SOURCE : U.S. News and World Report. The U.S. Canadian Survey made by the American Society of Actuaries.

Assimilation check

1. What are the requisites of a balanced diet, and how does it affect the normal well being of individuals ?
2. What are the causes of -
  - a. Malnutrition
  - b. Undernutrition
  - c. Obesity

How can these be remedied with the help of improved dietary standards ?

## CHAPTER V

MEAL PLANNING

Meal planning includes menu making, shopping, preparing and serving foods. With experience it is possible to do all this without apparent plans or shopping lists. But in the beginning, a home-maker has to make many rational decisions especially with limited resources of time, money, energy, knowledge, skill etc.

Importance of Meal Planning

Many home-makers feel that planning of meals in advance is not only time consuming but a waste of time as emergencies can arise which require an alteration of plans. This may be true but there are 5 definite benefits that are derived from careful planning.

- a. An hour or so spent in planning i.e. composing menus and shopping lists etc. saves time and efforts in shopping, cooking and planning each meal.
- b. Precise planning makes it easier to control expenditure on food in that (i) food choices can be made deliberately to suit the purse, (ii) choice of more, or less expensive foods can be made to arrive at the total expenditure, (iii) planned menus lead to planned shopping a practice which minimises waste, (iv) spending can be regulated because meals planned while marketing tend to be costly.
- c. Helps to achieve the goal of adequate nutrition; Meals planned on the spur of the moment may or may not provide for adequate nutrition.
- d. Planned meals generally include a wider variety of foods than meals prepared hurriedly.
- e. Helps form good meal planning habits. Practice in deciding what to serve, how much to spend and how much time and efforts to invest

helps to develop a good judgement and to minimise impulsive buying.

### Problems of Meal Planning

There are some definite factors that guide the meal planning for the family. They are :-

- a. Food budget
- b. Age, sex and activity of different family members
- c. Number of family members
- d. Family goals like education, status, health etc.
- e. Likes and dislikes, fads and fallacies of the different family members
- f. Availability of certain foodstuffs
- g. Market facilities
- h. The time and help the housewife has at her disposal
- i. State and health of different family members
- j. Nutritional needs

Keeping these factors in mind the housewife should plan the meal for the family.

As far as possible meals should be planned in advance. This will help in the buying and the preparation of foods. Alternatives or substitutes should be noted in case certain food items are not available in the market. Selecting food that are available in the season and preparing only sufficient quantities thereby avoiding waste will minimise expenditure in food.

Selection of food items to form a balanced diet may be a problem for some housewives. This problem can be simplified and a reasonably well balanced diet can be provided each day by including at least one or two items from the following food groups :

Milk and Milk products : Fresh milk, condensed or evaporated.  
Buttermilk, curd and cheese.

About two glasses for a child and one glass for an adult per day and at least one helping of curd or cottage cheese per day.

Flesh Foods : Eggs, meat, fish, poultry and cheese.

A normal serving each day of meat or fish or cheese - and at least 2-3 eggs per week should provide enough proteins.

Cereals: Wheat, Maize, millets, ragi, rice (unpolished preferably). Two or more servings per day.

Pulses : Peas, beans, dals, etc. at least one serving per day.

Nuts : (optional and should be included whenever possible), Almonds, walnuts, cashew nuts etc.

Vegetables : Green vegetables, root vegetables, potatoes. Two or more servings per day - raw or cooked.

Fruits : Oranges, lemons, tomatoes, apples, amla (raw or pickled) or any other fruit in season. Fruits can be substituted by sprouted pulses. At least one helping per day.

Edible Oils & Fats : Enough fat in the form of ghee or oil or butter should be included in the diet as they are a good source of energy and some fat soluble vitamins like vitamin A and D.

Another problem that a housewife faces is that of adapting a well balanced diet to the likes and dislikes of her family members and she can accomplish much by making the food attractive.

#### Making food attractive

1. Selecting food combinations which are colourful. Salads and garnishings improve the total effect of the foods.
2. Serving food in appropriate containers or dishes e.g. a gravied course should go in a deep bowl and a dry vegetable in a flat one.
3. Serving small helpings at a time.
4. Serving pleasing textures. Have a variety of textures within the meal.

5. Serving foods with flavour:

- a. Have a variety of flavours within the meal
- b. Serve flavours that go well together
- c. As far as possible serve a particular food item only once in the menu.
- d. Serve properly seasoned foods
- e. Cook foods until done. Cooking develops flavour, over-cooked and under-cooked foods lack flavour.
- f. Serve hot foods hot, and cold foods cold.

6. Serving nutritious meals :

- a. Serve at least one generous helping from each of the food groups daily.
- b. Do not throw away water from boiled vegetables and cereals. Use it for soups and gravy.
- c. Add raw fruits or vegetables in the form of salad with each meal.

Useful shopping hints

The money we spend on food is the most important part of the total expenditure on house-keeping. It is better that the amount to be spent on food is decided upon, in the beginning, and on no account must this money be sacrificed for entertainment, clothing or other luxuries.

It is advisable to deal with reliable traders and occasionally comparing the prices and the quality at different shopping places. Economy through inferior buying is not rational. Paying a little more for quality goods is economical in the long run.

Points to be considered while buying

- a. Plan what you have to buy and buy only that and no more. Consult your table on p.30 for alternatives e.g. if a certain food item is not available, what else can you buy without upsetting the menu and budget and the food value. It is better to prepare a



shopping blank and tick mark what you purchase. (A sample of shopping blank is on page 30.)

- b. Plan where you intend to shop. If possible keep a list of food prices from your previous shopping to compare prices in the market.
- c. Make a complete list of the quantities to be purchased. Take into consideration the size of packets available at your cooperative and other grocery stores.
- d. Carefully select the brand of dry and tinned foodstuffs that suit your budget.
- e. Buy unperishable foods like cereals, tinned foods, condiments and washing materials once a month if possible but not more than once a week.
- f. Be very selective in your purchase of fresh foods like fruits, vegetables, eggs, poultry, meat, bread and butter.
- g. Use all fresh foods within 24 hours of purchase unless you have storage facilities like a refrigerator.
- h. Always shop at a place which is scrupulously clean. Food in the shops especially the unwrapped ones should not be exposed to dust and free handling. Unwrapped loose and cut foods are cheaper but are unhygienic.

When buying see that :

Vegetables have a natural bright colour. Green vegetables should have crisp leaves which should snap sharply. Try and buy vegetables in season for they are cheaper and taste better.

Fruits, like vegetables, should as far as possible, be bought when in season. Try to select firm ripe fruit with natural freshness and this can be judged by the colour, smell and feel. As far as possible do not

buy over-ripe or raw fruit.

### Meat, fish and poultry

The meat of a young animal is light pink in colour, is firm to touch and has a bright appearance. The meat of aged animals is dark pink with a purple tinge and is slightly oily in appearance and is touch. Avoid meat from old animals as it takes longer to cook and digest.

### Eggs

Eggs should be bought from a reliable source, or should be tested for freshness. A fresh egg when placed in a bowl of water will lie flat on its side. A stale egg will have a tendency to stand and a bad egg will stand erect on its apex touching the bottom of the bowl.

### Fish

Fish when fresh has bright, clear eyes, firm flesh, a shining coat and red gills. The smell is nice and wholesome. As far as possible buy fish from a reliable shop. Sea fish is healthier, as it has certain important mineral salts. River fish should not be eaten during the rainy season. (§)

### Tinned foods

The life of a tin depends not only on the contents but also on the type of liquids (if any) used in preserving the temperature at which the tins are stored. Modern scientific way of tinning and preserving is fairly reliable and good firms are careful in using good quality tins and suitable liquids. Therefore choose from good brands and keep them in a cool dry place.

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§ - During the rainy season, the number and variety of microbes (bacteria) in the river water increase. Thus there will be a large number of "pathogenic bacteria" both inside and outside the fish. If this fish is not cleaned properly before consuming, it may lead to stomach upset and other diseases like Cholera, gastroenteritis, dysentery etc. Hence, during the monsoons, the fish should be used sparingly and after careful washing and cleaning. Stale fish should be discarded as it is not fit for consumption.

Approximate time for which the tinned foods can be safely be kept is given below :

Fruit	-	1 year
Honey and Jam	-	2 to 3 years
Vegetables	-	2 years
Fish and meat	-	several years
Unsweetened milk	-	2 to 3 years
Sweetened milk	-	6 to 9 months
Dried milk	-	upto 8 weeks

#### Perishable foods and how to store them

Besides meat, fish, eggs, there are certain foods which need special attention.

- a. Milk : If obtained in bottles from a city milk supply centre, the milk should be left in the bottles and kept in a cool place till boiled. Avoid bright sunlight as Vitamin B (Riboflavin) can be lost due to exposure to light.
- b. Cream : Cream does not remain good for more than 24 hours in cool weather and 12 hours in hot weather.
- c. Curd : Curd should not be kept for more than 24-48 hours.
- d. Cheese : Cheese for table use should be kept wrapped in a tin-foil to prevent drying and mould growth. Plastic bags also make good containers. Cooking cheese should be allowed to remain exposed to air (but not exposed to dust and flies) covered with a clean muslin, in order to make it hard and easy to grate. Keep all cheese at a low temperature, in a refrigerator, if possible.
- e. Fruits and vegetables : They are rich in vitamin C - which gets affected by storage. It is advisable to use them within 24 hours.

- f. Eggs : Eggs should be kept in a cool place. If kept in the refrigerator, allow them to come to room temperature before using them. This is especially necessary for cakes and puddings.
- g. Bread : Bread should be kept in a plastic bread box. Complete exclusion of air results in mould growth.
- h. Butter : Butter should be kept in a cool place. When it gets rancid (smell/taste) it should be converted into fat (ghee) for cooking.

#### Assimilation Check

1. List some of the factors that should be kept in mind while planning a meal for the family.
2. How can you with limited time and money serve balanced meals to the family ?
3. Make a weeks menu for a family with following particulars :
  - a. No. of family members - 2 adults  
3 children (under 12)
  - b. Work - Both the adults are sedentary workers.
  - c. Income - Total income Rs. 350 - 500.
  - d. Help - Only part-time help available to the house wife.



## CHAPTER VI

FEEDING THE FAMILY

Surveys have shown that food and nutrition play an important role in the growth and development of children. By growth we mean the physical increase in height and weight. But, development is an overall measure of body's weight, height, mental development and muscle coordination etc. This development is a continuous process from conception to maturity. It has been seen that there are two stages of rapid development during the life span, (i) from conception to early childhood and (ii) during adolescence. The nutritional needs vary to a very large extent during these different stages.

Infant Feeding

When the change over from the breast feeding to bottle feeding starts at the approximate age of 3-6 months, it is important to supplement the artificial milk. Cod liver oil in one form or another is essential as it gives the body vitamins A and D essential in the prevention of rickets and for growth of the bones. Vitamin C, the protective vitamin which builds resistance to infection is found in fruit juices and should be introduced in the diet as soon as possible. Vitamin B - which helps in regulating the digestive tract and helps prevent constipation exists in small quantities in vegetables and in large quantities in whole meal bread, egg yolk etc. This therefore, should be introduced when the child is 6 months old and the quantities of these foods should be increased slowly till the child is almost one year old.

Feeding the pre-school child

After the first year the child should be introduced to more solids and the quantity of milk should accordingly be cut down. Good eating habits should be encouraged and the feeding hours of children should be that of

peace and harmony. The digestion improves if the child accepts food happily. New foods should be introduced one at a time and in small quantities.

Eating lots of fruits and green leafy vegetables, both raw and cooked, should be encouraged and rich fried foods should be avoided. Meat and fish should be encouraged in the daily menu; as far as possible the child should be encouraged to eat out of the family menu.

The child's appetite is always changing and the mothers should never feel concerned about the child not eating well at one meal if he makes up for it in the second meal. But if the appetite is constantly decreasing, and the child is losing weight and is not bright and cheerful, then it is a matter for concern, and must be attended to by a doctor.

#### Elementary School Age feeding

This is a very critical age for children as far as eating is concerned. The children are exposed to new experiences which affects the digestion to a very great extent. During this period the child is being disciplined, exposed to new teaching aids and comes in contact with mates, especially those who are in the habit of eating between meals, chewing gum and eating candy. These experiences sometimes affect the child's appetite adversely. Hence regular feeding sometimes becomes difficult and needs special attention.

#### Nutritional requirements during this age

Calories : The caloric requirements for boys and girls upto the age of 5 years is more or less the same and starts increasing for boys faster than for girls after this age. It is safer to select the foods for this groups out of the basic seven groups mentioned earlier and an additional amount of calories be supplemented by giving more of breads, cereals, sweets etc.

Proteins : The increase in proteins intake is proportional to the child's development and growth. A good quality protein and different varieties of proteins rich food should be encouraged at this age.

Minerals : Calcium and iron (etc.) are very important at this stage as bones and teeth are being made and strengthened.

Vitamins : If there is a wider variety of foods selected from the basic seven food groups the vitamin requirements of the body are adequately met and very seldom needs to be compensated by artificial means. Citrous fruits, green vegetables, especially raw vegetables and sprouted grams should be encouraged.

School lunch programme :

In recent years it has been recognised by both parents and school authorities that food plays an important role in the child's performance at school. The school lunch project has been tried out in India by different organisations as a pilot project and the results have been extremely favourable. The advantages of the school lunch programme are many fold. They are :

1. Children's nutritional needs can be regulated to a very great extent.
2. A uniformity of feeding pattern can be introduced and
3. Good feeding habits can be encouraged at an early age, and the children in the company of others, learn to eat well.

In the lower income groups, this programme is also an incentive for the children to attend schools. The lunches should consist of some milk or milk products, high protein foods like eggs, cheese, peanuts, meat, fish or poultry, some cooked or uncooked vegetables or fruits or both, breads or other cereals and some fat like butter. The quantity can be adjusted to the needs and available finances.



(These programmes are at a very early stage of experimentation in India and they are being introduced mostly in schools for the lower income groups and in the villages.)

#### Feeding during pregnancy and lactation

Though pregnancy is considered to be a normal process, it makes many demands upon the mother's system. During the period of pregnancy the foetus is growing fast and in order to meet its demands the diet of the prospective mother needs very special attention, but this fact is so often neglected. Studies in this connection have shown a very distinct and significant relationship between the diet of a pregnant woman and the condition of her baby at birth and the first 15 days of life. Physically healthy children are born to better fed mothers. Inadequate diet during pregnancy may lead to mentally defective infants, premature births and at worst still-births.

Since metabolism rises during pregnancy especially during the second and third trimesters, it is desirable to increase the intake of milk. The increased intake of milk not only helps to meet the calorie requirements, but also adds <sup>which</sup> proteins, calcium and vitamins/are also valuable contributions to the mother's diet. The extra calories available from energy foods such as fats and carbohydrates should be discontinued as it sometimes lead to extra body weight.

#### Nutritional Requirements :

The nutritional requirements of a pregnant or a lactating woman are much more as compared with that of other women.

The recommended daily allowances for a normal woman during pregnancy and lactation are given below :

Nutritional essentials	Normal woman	Pregnancy	Lactation
Calories	2000	2400	3000
Proteins in gms.	60	85	100
Calcium in gms.	1.0	1.5	2.0
Iron in mg.	12	12	15
Vitamin A.I.U.	5000	6000	8000
Ascorbic acid mg.	70	100	150
Thiamine mg.	1.0	1.5	1.5
Riboflavin mg.	1.5	2.5	3.0
Vitamin D, I.U.	-	400	400

(Source : Food and Nutrition Board, Nutritional Research Council).

### Calories

It is not desirable for a pregnant woman to add weight out of proportion during pregnancy. It is recommended that an average gain of 1 kg. per month is desirable. The increase in milk intake is desirable to meet the extra calories required. The protein, calcium and vitamin requirements also can be met from the increased milk intake and this should be started at the outset of pregnancy.

### Protein requirements

The protein requirements of a pregnant woman increase to provide for the growth and development of the foetus. The best way to meet this is to increase the intake of meat, fish, eggs, cheese etc. since these are expensive foods and it may not always be possible to consume them in required amounts, the inexpensive source of proteins like soya beans, peanuts, (M.P.F. in India), dried skimmed milk, and beans should be taken in generous quantities.

### Calcium and Phosphorus

These are specially needed in generous amounts for the growth of the bony framework of the foetus and infants. Extra milk in the diet will meet

the required needs.

#### Iron requirements

An adequate iron supply is as important as any other nutrient. The prenatal storage of iron in the newborn lasts for approximately 3-4 months. Foods rich in iron like liver, kidney, eggs, meat, green leafy vegetables, enriched bread peas, beans and dried fruits should be incorporated in the daily intake.

#### Vitamin requirements

There is an increased need for almost all vitamins during this period and should be met by incorporating foods high in vitamins such as yellow-vegetables, milk, liver, eggs and butter.

#### Diet during lactation

Feeding makes ever greater demands on the mother's system than the pregnancy, and therefore, the diet of the mother should be increased to meet the need.

The nursing mother will require at least 1000 calories more than her normal needs. These needs may be met by consuming larger quantities of the foods, used during pregnancy.

#### Feeding the Adults

Food requirements during these years play a very important role because it is during this period that the results of good nutrition are very obvious and striking, and the effect of nutritional deficiencies are very prominent.

The surveys have shown that a large number of adults do not attain their maximum size of growth nor can they maintain the maximum strength and vitality. Although heredity play an important role in the total growth and development, good food and nutrition also play an equally important role especially when

good foundations are laid during the childhood.

The diet of a young adult, both men and women, depend on factors like body weight and the type of activity. The caloric and other requirements are given in table at page 16. If proper care is taken to include generous helping of at least one type of food from the basic seven food groups for individual meals, the diet will be sufficient to meet the needs of the body during this age.

### Feeding the aged

The older members of the family are often the forgotten ones on the family menu. The activity decreases with the advance of age, and the nutritional needs also change. The planning of food for the older people is not an easy problem because most of the eating habits are rigidly set, that it becomes difficult to change or modify them. The circumstances under which they live - living alone or with the family of young children and adults - will also make a difference in the feeding problems of the aged. But whoever plans for this group, should keep in mind the sentiments that go with age and keep their special likes and dislikes in mind at the same time not forgetting the nutritional needs:

Factors that should be kept in mind while planning :

1. The caloric needs of older people are less than that of the young adults because of the lesser activity.
2. The appetite in some people increase much more than they require and they eat more than can be assimilated, resulting in excessive body weight. While in others it may be so low that there is a danger of malnutrition.
3. Protein needs do not lessen in the old age - yet people have a tendency

- to eat less of proteins which results in protein deficiency.
4. The calcium needs of older people is little more than that required for the young adult. This is usually neglected, resulting in fragile bones and frequent fractures. Thus the diet should provide for plenty of calcium rich foods like milk and milk products distributed evenly throughout the day.
  5. The vitamin requirements do not change with age and as a safeguard against any deficiency the vitamin intake should continue as was in the younger days.

#### Seasoning of Food

Seasoning is one of the very important aspects of cooking, because the success in cooking lies to a great extent in the proper seasoning of food. Yet no hard and fast rules can be laid down for the use of different condiments spices and herbs, because taste varies so greatly and only experiences and a sensitive palate can teach this important part of cookery.

Just as an appropriate use of seasoning can bring out the best in foods, their inappropriate and excessive use may spoil the best of foods. It must be understood that seasoning can be added to the cooked food, but it cannot be taken out from the cooked food once it is added and many cooks spoil food by over seasoning. There are three fundamental rules that should however be kept in mind for good results :

1. Avoid seasoning the foods very highly, because the natural flavour of the foods will be completely lost, selective seasoning sometimes help the natural flavours to stand out better.
2. Avoid the combination of too many flavours in one dish because then none of them will do justice to the food.

3. As far as possible use natural seasonings and avoid artificial or synthetic ones.

The common condiments and their uses are given here :

<u>Name</u>	<u>How to use</u>
Salt - Is sold in the market as either cooking or table salt.	Usually added to all savoury dishes unless restricted on medical grounds. Use cooking salt for cooking and not the table salt. Avoid excessive use of it as it kills the natural flavours. a pinch of salt added to sweets like cakes and puddings bring out other flavours better.
Pepper made from dried berries of the pepper plant. When fresh the berries are green, then they change colour to red and finally to yellow when dried they become black. By grinding these dried black berries we get our black pepper. In the market it is sold as whole pepper corns or as ground powder.	For flavour freshly home ground pepper is best. Like salt, pepper can be added to all savoury dishes, but avoid its use in infant cooking.
Red Chillies A bright red powder made from dried red chillies. In market it is sold in two forms, one which is exceedingly hot, in which the skin and seeds are ground together and the other which is not so very hot but gives red colour to gravies etc. In this only the skin of the red chillies is ground.	It is exceedingly hot and should be sparingly used in gravies. Try to avoid these in infant and invalid cooking. Makes the food more appetizing and attractive.
Mustard - This is made from the seeds of red, brown and black mustards ground together. Mustard seeds are also sold whole.	Ground mustard can be added to most of the savoury dishes and in the sandwich paste and also can serve as a mustard sauce. Whole mustard seeds are used for some gravies and in some preserves.
Vinegar - generally made from malt or acetic acid, and sometimes from wine or grape juice, It can be flavoured with different flavourings depending on the purpose for which it is used.	Vinegar is used for pickling in salad dressings and for marinating fish (to kill the strong smell of certain types of river fish). It is also added to meat gravies to make the meat tender. A little vinegar in stews and sauces improves the flavour.

<u>Spices</u>	<u>Uses</u>
Aniseed (Saunf): The fruit of a plant which grows in many parts of Europe and Asia.	Used for flavouring many confectionery- desserts.
Chillies: The pods of tropical plant of which there are several varieties.	Unripe green pods are used for flavouring and garnishing gravies, soups, chutnies and can be pickled. The red ones are hot in flavour. Used for rich gravies and pickles.
Cinnamon: The inner bark of small tree growing in Ceylon. In the market it is available in sticks, a couple of inches in length - or sold in powder form.	Used for flavouring, cakes, biscuits, puddings, stews, sauces and gravies and savoury rice.
Cloves: The dried unopen flower buds of the clove tree which grows in hot moist climate. Resembles small nail heads. Cloves contain an oil which has a very strong flavour and pungent taste. Sold whole, ground or in oil form.	Used both in savoury as well as sweet dishes, especially for stewed apples and pears, fruit pies, sauces, stews and puddings and in gravy and rice.
Coriander: The dried fruit of a plant that grows in Asia, America and S.Europe. The seeds have a pleasant smell and a pungent flavour.	One of the ingredients in curry powder. Also an important ingredient for all types of Indian curries.
Curry powder: A mixture of various spices like chillies, coriander, ginger power.	Extremely hot, should be used only for rich dishes like curries and in small amounts can be used for soups and sauces.
Ginger: The root of an East Indian plant, which is scalded and dried. In the market it is sold as a root, ground, crystallized or preserved.	Ground ginger is used in chutnies, cakes biscuits and puddings etc. Root ginger is used in pickling and in gravies. Crystallized ginger is used in cakes and puddings.
Nutmeg: The kernel of the stone of the pear-shaped fruit of the nutmeg tree. It is sold whole - and since it is expensive a little to be grated as and when needed.	Used in both sweet and savoury dishes or grated over milk puddings, custards and junkets.
Mace: Mace is the dried outer layer of nutmeg. It is available in chips blades or ground.	Used both in sweet and savoury dishes and in sauces and pickles.
Turmeric: A yellow powder made from the tubers of an East Indian plant.	Used in curry powder and for all Indian curries for giving colour and flavour. Also for rice and for roast meats, poultry, game etc.

List of Common Indian Seasonings with their  
English names

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<u>English</u>	<u>Indian</u>
Turmeric	Haldi
Cloves	Laung
Cinnamon	Dalchini
Bayleaf or Cassia leaves	Tejpatta
Corriander Seeds	Dhania
Corriander leaves	Hara Dhania
Green Cardamom	Elaichi
Black Cardamom	
Cummin Seed	Zeera
Aniseed	Saunf
Fenugreek	<b>Methi</b>
Sesame seeds	Til
Ginger	Adrak
Poppy Seeds	Khus Khus
Saffron	Kesar
Red Pepper (Chillies)	Mirch
A mixture of powdered cloves cinnamon, cumin, cardamoms and corriander seeds used for seasoning.	Garam Masala
Asafoetida	Hing
Mint	Podina
Silver paper	Vark
Raisins	Kismis
Pistachios	Pista
Almonds	Badam
Cashew nuts	Kaju
Dry Ginger	Sonth
Tamarind	Imli
Mango powder	Amchur
Black pepper	Kala Mirch
Coconut	Nariyal
Garlic	Lahsan
Green chillies	Harimirch



English

Maize or corn  
Millet  
Mint leaves  
Mustard  
Onions  
Mixed spices  
Vinegar

Indian

Makki  
Bajra  
Pudina  
Rai  
Pyaz  
Garam masala  
Sirka

42(A)

R E C I P E

S E C T I O N

COCONUT MILKMethod of making Coconut milk:

Take one fresh coconut and grate it very finely. Place the grated coconut in a bowl and pour boiling water on it just enough to moisten and cover it. Allow it to stand in a warm place for about half an hour and then squeeze the milk out by pressing it through a coarse cloth.

Used in certain places where natural milk is either not available or is too expensive, for feeding the young children. Coconut milk is used extensively for cooking in Ceylon.

PEANUT MILKMethod:

Take 1 kg. (or pound) of peanuts and roast them on slow fire. When the skin loosens, rub it lightly between the hands to separate the skin from the seeds. Take cleaned seeds and pound them coarsely. Place them in a bowl. Pour boiling water on them just enough to cover the seeds. Allow this to stand in a warm place over night and then squeeze out the milk by passing it through coarse cloth.

RICE AND RICE PREPARATIONSPlain Boiled RiceMethod I.

Pick and wash 1 cup of unpolished or polished rice. Boil 6-8 cups of water in a pan with  $\frac{1}{2}$  tea spoon salt. When water begins to boil add the rice and cook it on slow fire for 15-20 minutes till the rice grain, when pressed between the thumb and the finger, is tender and can be pressed easily.

Drain the water completely and serve the rice with curd or gravy.  
(The water thus strained should not be thrown away but could be used for cooking Dal, gravy or soups).

#### Method II.

Pick, wash and soak 1 cup of rice for about  $\frac{1}{2}$  hour. Drain the water and put the rice in a sauce pan with 2 cups of water and  $\frac{1}{2}$  teaspoon salt. Bring it to boil rapidly. Then reduce the heat and cook on slow fire in a covered pan, till all the water has been absorbed and the rice grain when pressed between the thumb and the finger is soft.

#### Variations of Boiled Rice

##### Savoury - Yellow Rice

#### Ingredients:

- 1 cup of boiled rice.
- $\frac{1}{2}$  teaspoon turmeric powder
- $\frac{1}{2}$  teaspoon mustard seeds
- 1 teaspoon butter or ghee
- Juice of 2 lemons
- Salt to taste

#### Method:

Heat ghee in a pan, add mustard seeds, turmeric powder and salt - and fry for one minute. Add the boiled rice in it and stir well with a flat spoon - Till the turmeric gives an even yellow colour to the rice. Remove from fire and add the lemon juice - stir well and serve with curd.

COCONUT RICEIngredients

1 cup of boiled rice  
 1 table spoon butter or ghee  
 $\frac{1}{2}$  teaspoon zeera seeds  
 4 table spoons freshly grated coconut  
 2 tablespoons finally chopped onions  
 1 green chilli finally chopped  
 a few corriander leaves  
 salt to taste

Method

Heat butter or ghee in a pan, add the chopped onions and fry till light brown in colour. Add the zeera seeds and stir another minute. Add the boiled rice and salt and mix well. Add grated coconut, finally chopped green chilli and serve garnished with corriender leaves.

VEGETABLE RICEIngredients

1 cup boiled rice  
 1 small carrot  
 2 table spoons dried peas or  
 200 gms fresh peas (unpeeled)  
 200 gms beans or cabbage  
 3 table spoons butter or ghee  
 $\frac{1}{2}$  teaspoon zeera seeds,  
 Salt and pepper.

Method

Cut carrots first into rounds and then into thin strips and keep aside. Cut beans into small squares or cabbage into fine shreads. Peel the peas if unshelled. Put all the vegetables in a pan after measuring it with a cup - and add equal quantities of water with  $\frac{1}{2}$  teaspoon of salt. Cook this on slow fire till the vegetables are tender and all the water is absorbed (add a little water if required). Heat 1 table-spoon of ghee in a pan, add half the boiled vegetables and stir them with a flat spoon for a minute or two, add salt and pepper and remove in a plate. Treat the other half of the vegetables in the same way and keep aside. Heat the remaining 1 tablespoon of ghee in a pan, and zeera seeds and the boiled rice, salt and pepper and stir with a flat spoon. Mix the prepared vegetables with the rice and serve with curd or any gravy. (Any cooked or left over vegetables could be used for this).

RICE WITH SPROUTED GRAMSIngredients

1 cup boiled rice  
 1 cup sprouted grams.  
  
 1 table spoon grated coconut or coarsely ground roasted peanuts.  
 1 table-spoon ghee  
 1 green chilli ,  
 a little corriander leaves  
 salt and pepper to taste  
 juice of 1 lemon

Method

Heat ghee in a pan and add the sprouted grams, fry for a minute or two, add salt and pepper to taste.

Add the boiled rice, chopped green chilli, corriander leaves and the grated coconut or ground roasted peanuts.

Mix well and serve with curd or some chutney.

FRIED RICEIngredients

1 cup rice

1 medium onion

2 sticks cinnamon

2-4 cloves

2-4 pepper corns

$\frac{1}{2}$  teaspoon zeera

1 table spoon ghee

salt to taste

Method

Pick, wash and soak rice.

Slice onion finely

Heat ghee in a pan and fry sliced onions until brown. Add whole spices and fry another minute or two.

Add rice and fry for 2 minutes - add double the amount of water and salt to taste. Cover it with a lid and cook on slow fire till the rice is tender. (If the rice is to be cooked in a pressure cooker, use equal quantities of rice and water).

N.B. Keeping this basic recipe of fried rice the same, hundreds of variations can be introduced to make Pulao with vegetables or meat etc.

## C U R R I E S

Curries are well known as a major item in the Indian meal. The basic ingredients used in the making of curry is the same. With a few variations it is possible to make a very large varieties of these curries.

For any curry some fat is needed for frying the thickening ingredients. These ingredients are usually onions and tomatoes and some spices. The proportions are absolutely dependent on the taste and judgement of the individuals.

The success of a good curry lies in the proper selection of spices and herbs and the right type of seasonings.

Sometimes, instead of separate spices, a prepared mixture called the curry powder is used. A good curry powder can produce the best results.

A good curry powder should be able to keep for years and should be able to give the best of results. It is made up of many different seeds, roots and spices, well chosen and combined in proper proportions. It should neither be too hot or pungent.

Curries have a definite function to perform in the body. Its ingredients are such that they help the secretion of digestive juices.

### 1. VEGETABLE CURRY

250 gms unshelled peas or 50 gms dried peas.

3-4 medium potatoes

1 big onion

1" piece ginger

2-4 garlic pods

$\frac{1}{2}$  teaspoons each zeera seeds, dhania powder, haldi (turmeric), red chillies, salt to taste.



2 medium tomatoes.

Corriander leaves.

2 table spoons curd - 1 tablespoon fat.

### Method

Shell peas, cut potatoes in fours if not too big or in eight pieces if the potatoes are very big.

Slice onion, garlic and ginger very fine or grate or grind into a paste.

Heat fat in a heavy bottomed pan (Degchi). Add onions, ginger and garlic chipped or paste, and fry till golden brown in colour, add zeera, dhania, turmeric (haldi) and red chillies and fry for another 2 minutes.

Add the curd and chopped tomatoes, and cook till the tomatoes are a pulp, and the fat separates from masala.

Add the peas and potatoes - and 2-3 cups of water. Cook on slow fire till the vegetables are tender and the gravy thickens.

Serve garnished with chopped green chillies and corriander leaves.

### 2. PEAS AND PANEER CURRY

Use equal amounts of peas and freshly prepared cottage cheese in the recipe for vegetable curry and use the same methods.

### 3. MEAT AND POTATO CURRY

Substitute 500 gms of meat cut in small pieces instead of peas in the recipe for vegetable curry and cook exactly the same way.

### 4. CHICKEN CURRY

Substitute 500 gms of chicken pieces instead of meat in the above recipe

### 5. PRAWN CURRY

500 gms freshly shelled prawns

1 large onion, 1" piece ginger

4-6 cloves garlic

1 small tomato

2 table spoon tomato puree or pulp or tomato sauce

4 table spoons fat

$\frac{1}{2}$  teaspoon each turmeric (haldi) powder, zeera, mango powder, red chillies.

1 green chilli and corriander leaves.

#### Method

Clean, wash and drain the prawns

Heat fat and fry prawns to a light golden colour, drain and keep aside.

Prepare gravy with the onions, ginger, garlic, tomatoes and spices and enough water.

When gravey begins to thicken add the fried prawns and tomato pulp or sauce. Cook another 2 minutes.

Serve garnished with green chillies and corriander leaves.

#### DRY CURRIES

##### Vegetable curry

#### Ingredients :

250 gms beans

250 gms potatoes

250 gms tomatoes

1 big onion

$\frac{1}{2}$  teaspoon each zeera, dhania, turmeric (haldi) powder, and red chilli powder mash and

$1\frac{1}{2}$  table spoon ghee - salt to taste

Method

Cut beans and potatoes in small squares

Slice onion and tomatoes separately

Heat ghee in a pan, add the sliced onions, and fry till light golden in colour, add zeera, dhania, Turmeric (haldi) powder and red chillies.

Add sliced tomatoes to the prepared vegetables and salt.

Add half a cup of water and cover with a lid. Simmer on slow fire till vegetables are tender and all the water is absorbed.

Fry with a flat spoon for a minute or two to evaporate all the water.

Serve with chapaties.

N.B. Using the above method and substituting any seasonal vegetables you can prepare a large variety of dry vegetable curries. e.g. Cauliflower and Peas, Cauliflower and Potatoes, Peas and Potatoes, Carrots and Peas, Carrots and potatoes, Cabbage and Peas, and any combination of your own choice.

Dry Meat Curry (Bhoona meat)Ingredients :

500 gms lean meat cut in squares

1½ table spoons ghee

1 onion large

2" piece ginger

6 cloves garlic

1 table spoon vinegar, or

2 table spoons curd

2 table spoons coconut grated

2 large tomatoes

$\frac{1}{2}$  teaspoon each - zeera, dhania, turmeric (haldi) powder, red chillies, garam masala whole or powdered.

Salt to taste.

Corriander and green chillies for garnishing.

#### Method

Wash and boil meat with whole garam masala in salted water just enough to leave  $\frac{1}{2}$  cup of stock.

Separate the pieces of meat from the stock.

Mince the onion, ginger and garlic.

Heat ghee and fry the onions, ginger and garlic. When lightly browned, add spices and chopped tomatoes - fry the masala adding a little stock till the fat separates from the masala.

Add the pieces of meat and fry in the masala using the stock and vinegar. When the pieces of meat are fried well, add the remaining stock and cook on slow fire till the water dries up.

Serve garnished with coconut, corriander and green chillies.

#### D A L S

The rich source of proteins and certain vitamins for those who do not consume meat and flesh. There are many different varieties of these. Made well, the Dal is a delicacy amongst the vegetarians.

Dals can be prepared in 4 major ways :

Dal curry

Dal dry

Dal with another equally important and prominent counterpart: e.g. Dal with greens called Dal Sag. Dal with meat called Dal Meat. Dal with rice called Khichri.

Dals made into kofta or made into Bhale or Dosa or Idli.

### Dal Curry

#### Ingredients :

1 cup Mussor or Mong or Toor dal.

1 table spoon ghee

1 onion (optional)

2 large tomato

$\frac{1}{2}$  tea spoon each of zeera, seeds, dhania powder, turmeric (haldi) powder, red chillies.

1 green chilli (for garnishing)

#### Method :

Pick, wash and soak dal for  $\frac{1}{2}$  hour. (if time permits or use immediately).

Boil 4 cups of water and put the soaked dal in it, with salt and turmeric (haldi) powder and cook on slow s rring it occasionally till the dal grains are soft and the water is reduced to almost half.

Add chopped tomatoes and stir well with a heavy spoon mixing the dal well.

This may take about 5-7 minutes. Remove it from fire.

Heat ghee in a pan - add sliced onion and fry till light brown in colour.

Add zeera seeds, dhania powder and red chillies and the whole green chilli.

Pour hot dal on ghee and the masalas and leave it on fire another 1 minute stir well and serve with either rice or chapaties.

### Dal dry

#### Ingredients :

1 cup urad or green gram dal

1 medium onion

$\frac{1}{2}$  teaspoon each zeera seeds, chilli powder, turmeric (haldi) powder, and mango powder.

1 table spoon fat.

Salt to taste.

Method :

Pick, wash and soak dal over night. (if time permits)

Slice onions finely.

Heat ghee in a pan and fry onions till light brown, add the dry masalas and toss in hot fat for a minute or two.

Add the dal and salt. Add  $\frac{1}{2}$  a cup of water - and cook on very slow fire in a covered pan - shaking the pan occasionally.

When all the water is absorbed and dal tender add chopped green chillies and mango powder.

Serve dry (resembling rice) garnished with corriander or grated fresh coco coconut (optional).

CHAPPATIES, PARATHAS, ROTI & ITS VARIATIONS

Wheat flour commonly known as Atta is the staple food for majority of Indians, except for the people living in the coastal areas. It can be used in a variety of ways but the basic dough is more or less the same and the preparation of chappaties or roties is basically the same.

CHAPPATI

Ingredients :

1 cup of Atta

A pinch of salt, and

Enough water to make a smooth dough.

Method

Sieve Atta and salt together in a plate, add little water at a time and with the help of hands make a stiff dough. Cover it with a wet cloth and leave it for at least 1-2 hours before making into chappaties. Just before making chappaties, kneed it well with the wet hand till the dough is smooth.

Divide this into small rounds (the size of a big walnut) and roll on a floured board into a thin round. Bake on a hot iron plate (tawa).

Variations

1. Basan Roti - Take equal quantities of bengal gram flour and atta and add some seasoning of red chillies and salt and make a dough exactly like before. Roll into chappaties.
2. Potato Besan Roti - Take equal quantities of boiled mashed potatoes, Bengal gram flour and Atta, add seasonings and make a dough for Roti.
3. Roti with greens - For 1 cup of Atta add 1 cup of finally chopped greens (Methi or palak) 1 table spoonful of finely chopped onion, 1 green chilli finely chopped and seasoning of salt, and red chillies. Mix all the ingredients and make a dough for Roti.
4. Roti with left-over cooked dal - For every 1 cup of left over cooked dal use 2 cups of Atta and make a dough without using any water - use this dough for making chappaties.
5. Roti with left over cooked dry vegetables - With a fork mash the cooked Vegetables and for every 1 cup of mashed vegetables use 1 cup of Atta. Make a dough using a little water if required. Use this for roti.

FRESH CHUTNEYSMint and Corriander Chutney

## Ingredients :

1<sup>2</sup> cup picked leaves of Mint  
 ½ cup picked leaves of corriander  
 1 small onion (optional)  
 Juice of 1 lemon  
 1 green chilli  
 salt to taste  
 ½ teaspoon sugar

## Method :

Wash the leaves and chop the onion and green chilli fine.

Place the leaves, onion and green chillies on a grinding stone and grind them into a fine paste.

Place in a bowl and add sugar and juice of 1 lemon.

Coconut Chutney

## Ingredients :

½ fresh coconut finely grated.  
 2 green chillies.  
 1" piece ginger  
 salt to taste  
 ½ lemon

## Method :

Grind grated coconut, green chillies, and ginger finely - add lemon juice and salt.



Green Mango ChutneyIngredients :

2 green mangoes  
 Salt, red chillies  
 1 teaspoon sugar  
 1 green chilli

Method :

Peel and cut the mangoes into small pieces, and grind it fine with salt, green chillies and a small piece of Hing (Asafoetida). Add sugar in the end.

Banana Peel chutneyIngredients :

Peels of 2 ripe bananas  
 2 table spoons roasted peanuts (crushed)  
 2 table spoons grated coconut  
 1 raw mango or 1 teaspoon mango powder.  
 1 onion (optional)  
 2" piece ginger  
 2 green chillies  
 salt to taste  
 Small piece of Asafoetida (Hing)  
 $\frac{1}{2}$  teaspoon sugar or shakkar  
 Juice of 1 lemon

Method :

Wash and cut the banana peels in small pieces. Grind it fine along with all the other ingredients. Add shakkar and lemon juice in the end.

RECIPES WITH SUBSTITUTE FOODSMakki (corn) cutlets

## Ingredients :

250 gms corn (fresh)

250 gms potatoes (boiled and mashed)

1 Egg (Hard boiled)

2 tablespoons bread and 1 egg for coating

Salt and peppers to taste

1 green chilli a few corriander leaves

Fat for frying

## Method :

Boil the corn in salted water - and coarsely pound it on grinding stone. Boil peas and keep aside.

Chop up the boiled egg and mix it with pounded corn, and mashed potatoes.

Add chopped green chillies and corriander

Shape mixture into cutlets

Dip in beaten egg and roll in bread and fry in deep fat to golden brown colour.

Yam and Potato cutlets

## Ingredients :

250 gms Yam

250 gms potatoes

250 gms mixed vegetables (carrots, peas, beans)

50 gms Beet or any other leaves

1 onion medium (fine)

Juice of 1 lemon

Salt, pepper to taste

2 green chillies and some corriander

1 teaspoon Anichur

1 Egg or 2 tablespoons Besan for coating

2-4 tablespoons bread crumbs

Method :

Cut the vegetables (carrots, peas and green leaves) very fine, wash and leave to drain.

Boil yam and potatoes and mash them. Boil peas and keep aside.

Add prepared vegetables, seasonings and chopped onion.

Shape the mixture into cutlets.

Dip in either beaten egg or Besan dissolved in water to make a thin batter and rolled in bread crumbs.

Banana Cutlets

Ingredients :

6 raw bananas

250 gms vegetables (carrots, peas and beans)

1 Egg and 2 tablespoons for coating, or

2 tablespoons besan dissolved in water to make a thin batter.

Salt and pepper to taste.

1 teaspoon Anichur.

Juice of 1 lemon

2 green chillies and few corriander leaves.

1 medium onion.

Method :

Boil bananas with skin - peel and mash and keep aside.

Prepare and boil them in little salted water, drain and keep aside.

Mix together boiled mashed bananas, prepared vegetables, salt, pepper, minced onion, juice of lemon Anichur, green chillies and corriander.

Shape into cutlets, dip in either beaten egg or besan batter, roll in bread crumbs and fry in deep fat to a golden brown colours.

Sago Cutlets (Vegetarian)

Ingredients :

250 gms - sago

500 gms - potatoes (boiled and mashed)

100 gms peanuts

2-4 green chillies

1 small bunch of Dhania

Salt and pepper to taste

Juice of one lemon or  $\frac{1}{2}$  teaspoon Anichur.

Fat for frying.

Method :

Wash and soak sago for 10-15 minutes - Drain and keep aside.

Roast and coarsely grind the peanuts.

Chop up green chillies and dhania.

Mix all the ingredients together and shape them into cutlets.

Fry in deep fat.

Sago Cutlets (Non-vegetarian)

Ingredients :

250 gms sago

250 gms potatoes (Boiled and mashed)

250 gms minced meat (boiled)

1 medium size onion

2" piece ginger  
 2-4 green chillies  
 1 small bunch of Dhania  
 Salt and pepper to taste  
 Juice of 1 lemon or  $\frac{1}{2}$  teaspoon Anichur  
 $\frac{1}{2}$  teaspoon garam masala  
 Fat for frying.

Method :

Wash and soak sago for 10-15 minutes - Drain and keep aside.  
 Chop the onions, ginger, green chillies, and Dhania.  
 Heat 1 table spoon fat in a frying pan and the onions and ginger and  
 add the boiled meat - fry to a nice golden colour.  
 Mix together all the ingredients (sago, mashed potatoes and the prepared  
 meat, chopped up green chillies and hara dhania, salt and pepper and  
 juice of lemon).  
 Roll in shape of a small cutlets and fry in deep ghee.

Dal Cutlets (Vegetarian)

Ingredients :

250 gms channa dal or any other dal.  
 250 gms sprouted Moong dal.  
 250 gms boiled mashed potatoes or raw bananas.  
 2 table spoons chopped onions and ginger.  
 2 table spoons grated coconut.  
 salt and pepper to taste.  
 $\frac{1}{2}$  teaspoon Anichur.  
 $\frac{1}{2}$  teaspoon garam masala.

2-4 green chillies and

1 bunch Dhania (fresh)

Fat for frying

Method :

Keep the Moong dal for sprouting 24 hours in advance.

Soak the other dal for 3-4 hours.

Coarsely ground the two dals and mix in all the other ingredients

Shape into cutlets and fry in deep fat.

Dal and Mince Cutlets

In the above recipe use 250 gms of boiled minced meat instead of sprouted moong dal and follow the same method.

SWEET BAJRA ROTI

Ingredients :

250 gms Bajra flour

100 gms Jaggery

1 table spoon ghee

1 table spoon grated coconut

$\frac{1}{2}$  teaspoon saunf

A pinch of salt

$\frac{1}{4}$  cup curds

Method :

Mix Bajra flour, jaggery, ghee, coconut and saunf and make a stiff dough using the curds. (Add extra water if required).

Allow the dough to stand for  $\frac{1}{2}$  hour before using, covered with a wet cloth. Knead well before using.

Sweet Roti with bananasIngredients :

- 250 gms wheat flour (Atta)
- 50 gms M.P.F. flour (Coarsely ground roasted peanuts)
- 100 gms Brown sugar or Jaggery (or plain sugar)
- 2 mashed bananas
- $\frac{1}{2}$  teaspoon saunf
- $\frac{1}{4}$  cup milk - (or coconut milk)
- 2 tablespoons fat.

Method :

Dissolve brown sugar or jaggery in milk.

Mix together Atta, M.P.F., mashed bananas and saunf.

Add the milk and jaggery and knead to a stiff dough. Use little extra water if needed. Leave the dough for  $\frac{1}{2}$  hour.

Make into small Roties and smear with fat - can keep for 3-4 days.

Potato Besan RotiIngredients :

- 250 gms Besan (Bengal gram flour)
- 250 gms potatoes (Boiled and mashed)
- 1 onion cut very fine
- $\frac{1}{2}$  teaspoon red chillies
- 1 green chillie (chopped)
- $\frac{1}{2}$  teaspoon Anichur
- Salt and pepper to taste
- 2 teaspoon ghee

Method :

Mix all the ingredients and make a dough - keep for half an hour then make into Roti.

STUFFED VEGETABLES

Certain vegetables like capsicum cabbage, tomatoes, cucumber, lawki can be stuffed with different fillings and made into a main dish for a meat. For filling the vegetables are to be washed, dried and carefully scooped from inside and filled in with different fillings and later either baked or fried. The vegetables could be tied with a piece of string to prevent the stuffing from coming out. The string to be removed before serving the dish.

Meat stuffingIngredients :

1 cup of minced meat

1 onion, (chopped fine)

1" piece ginger

$\frac{1}{2}$  teaspoon each haldi (turmeric) red chillies, zeera and dhania powder and anichur.

1 green chilli and 1 small buch of hara dhania.

1 table spoon fat.

Salt to taste.

Method :

Heat fat in a pan

Add chopped onion and fry to golden colour

Add dry masalas and the minced meat and fry till the fat starts to separate from the masala.

Add salt green chillies and dhania and use it for filling different vegetables.



VEGETABLE STUFFING

Instead of 1 cup of minced meat use 1 cup of finely dried and boiled vegetables like carrots, beans, cauliflower, or boiled peas and potatoes, either separately or in combination with other vegetables and made in exactly the same way as the meat filling.

Sprouted gram stuffing

Use  $\frac{1}{2}$  cup each of sprouted moong dal and  $\frac{1}{2}$  cup of any other prepared vegetables can be used in exactly the same way.

Cottage cheese stuffing

Use  $\frac{1}{2}$  cup of freshly made cottage cheese and  $\frac{1}{2}$  cup other prepared vegetables could be used for stuffing the vegetables.

SWEETSPeanut BrittleIngredients :

- 1 cup jaggery
- 1 cup roasted peanuts
- 2 table-spoons ghee

Method :

Heat fat and add the jaggery and the peanuts.

Cook this on slow fire stirring constantly to prevent the Jaggery from sticking to the base and sides of the pan.

Cook till the Jaggery turns colour and forms into a ball consistency.

(Ball consistency is when a drop of the mixture dropped into a cup of cold water forms a small ball and floats on the surface)

Grease well a flat or a marble slab and pour the mixture on it.

All to set - when half set, make square markings with a knife.

Allow to set completely - then break into pieces and store in a dry airtight Jar.

#### Puffed Rice Brittle

In the above recipe use 2 cups of roasted puffed rice instead of 1 cup of Peanuts - and prepare the brittle in the same way.

#### Besan Barfi

##### Ingredients :

- 1 cup of Besan
- 1 cup of sugar (ground or crystal)
- 1 cup of ghee

##### Method :

Heat ghee and add Besan - fry this on a slow fire till the mixture has a rich golden colour and the nice smell of roasted besan.

Remove it from fire and add the ground sugar - stir well and keep on stirring till the mixture is cool.

Set this in a well greased thal or a plate - Leave it overnight before cutting into pieces.

#### Pumpkin sweet

##### Ingredients :

- 250 gms pumpkin (yellow)
- 500 gms milk
- $\frac{1}{2}$  cup jaggery or brown sugar
- 1 packet gelatine
- 2 table spoons custard powder or cornflour
- 4-6 Elachi (small)
- $\frac{1}{2}$  cup cream

Method :

Peel and cut pumpkin into small pieces and boil in little water till tender.

Mash the pumpkin with the back of a spoon and keep aside.

Heat milk and when boiling add 2 table spoons of custard dissolved in 4 table spoons of cold water.

Cook on a slow fire stirring all the time till the custard thickens.

Allow it to cool.

Mix the mashed pumpkin, prepared custard and the jaggery and Elachi powdered.

Dissolve gelatine in little warm water and add to the above mixture.

All cream last of all and beat well with an egg beater - Allow to set on Ice or in the frig and serve very cold.

DIFFERENT TYPES OF SANDWICHES

Sandwiches form an important item for the mid-day meal and packed lunch-programme. They are easy to pack, handle, and make and can be made nutritious depending on the fillings used.

Sandwiches are nothing but 2 slices of bread joined together with butter and some other filling. They have a tendency to dry very quickly when carried for school lunch box or packed for a husband or self for taking to the office. To prevent this it is advisable to use moist fillings - and take care to wrap the sandwiches in a grease-proof paper or plastic bags or a tin box.

A list of suggested sandwich fillings is given below :

Egg filling (good for children)

1 table spoon butter, 1 hard boiled and mashed egg, a pinch of salt and pepper and mustard powder, (makes 2 sandwiches)

Cottage cheese

1 table spoon butter, 2 table spoons freshly prepared cottage cheese (or equal amount of grated cooking or processed cheese) a dash of pepper and mustard.

Cucumber

1 table spoon butter, 2 table spoons of grated cucumbers or 5-6 rounds of cut cucumber, sprinkle of salt and pepper.

Tomatoes

Use sliced tomatoes instead of cut cucumber in the above recipe.

Chutney filling

1 table spoon butter 1 table spoon Mint chutney (or any other chutney - see recipe for making chutney)

Left over filling

1 table spoon butter 2-4 table spoons left over dry cooked vegetables (like potatoes, peas, cauliflower, carrots etc.) mashed well, or (cooked left over mince can also be successfully used for making sandwich filling).

Banana filling (sweet for children)

1 table spoon unsalted butter,  $\frac{1}{2}$  banana well mashed  $\frac{1}{2}$  teaspoon sugar.

Jam filling

1 table spoon unsalted butter, 1 table spoon, any jam.

S A L A D SDifferent types of Salads

Salads are useful item in our meal. They are easy to make and attractive to look at. Also they are nutritious as raw vegetables and fruits are used with some dressing and no nutrients are lost due to cooking. Salads should be included in diet as a rule and not as an excuse vegetable like boiled potatoes,

Peas, raw carrots, tomatoes, cucumbers, cabbage, radish, etc. can be successfully used. Certain fruits like grapes, oranges and bananas also along with vegetables can make attractive salads.

The vegetables can be cut, diced, grated or sliced, and arranged in proper combination will give best results. The salads can be served with or without dressing - without dressing the use of salt and pepper is enough, but some salad dressings add more taste to the salads.

#### Salad dressings

Lemon juice or vinegar with sauf and pepper.

3 parts of vinegar and a 1 part of salad oil - a big pinch of sugar - mixed well is a good salad dressing.

Cream lemon juice, salt and pepper.

Fruit juice (orange or pineapple) with a little vinegar and sugar make a good dressing.

Curd well beaten with salt pepper and few mustard seeds also make a good dressing.

#### Cabbage Khir

##### Ingredients :

250 gms cabbage

500 gms milk

100 gms sugar

1 teaspoon cardamoms (Powder)

##### Method :

Shred the cabbage, wash and cook in milk on slow fire till the cabbage is soft and the milk has thickened. Add sugar, cook another 5 minutes.

Cool and add powdered cardamoms, chill and serve.

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SUGGESTED

MENUS

FOR

DIFFERENT

AGE

GROUPS

Suggested Menus for Different Age GroupsAge 1 - 5 years.VegetarianNon-VegetarianBreakfast

1 glass of Milk ( 8 Ozs.)  
 Besan Roti with butter  
 1 raw vegetable like  
 carrot or a tomato or  
 some fruit

1 glass of Milk (8 Ozs.)  
 1 Egg (boiled or serambled)  
 1-2 slices of bread with  
 butter and Jam.  
 1 raw vegetable like carrot  
 or a tomato or some fruit.

Mid-morning

If in school (Packed box)  
 1 sandwich with cucumber  
 or tomato or cheese.  
 1 snach (sweet) like a  
 biscuit or a cookie.

1 sandwich with cheese or  
 ham or even tomato or cucumber  
 1 snath (sweet) like a  
 biscuit or a cokie.

Lunch

Rice one serving or  
 1 chappati or both.  
 $\frac{1}{2}$  cup curd  
 1 vegetable or dal  
 Some salad

Rice one serving or  
 1 chappati or both  
 $\frac{1}{2}$  cup curd  
 1 vegetable or dal  
 Some salad

Evening

1 glass of milk  
 1 snack either weet or

Rice one serving or  
 1 chappati or both

<u>Vegetarian</u>	<u>Non-vegetarian</u>
<u>Evening</u>	
Savoury or 2 biscuits.	$\frac{1}{2}$ cup curd 1 vegetable or dal Some salad
<u>Dinner</u>	
1 chappati	1 chappati
1 dal serving	1 Meat serving
1 vegetable serving	Cooked either with vegetables or alone.
1 sweet dish serving made with milk.	1 sweet dish serving made with milk.

Age - 5 - 10 yearsBreakfast

1 glass of Milk (8 Ozs.)	1 glass of milk (8 Ozs.)
1 Besan Roti or Besan pura with butter or/and	1 Egg (boiled, fried or ommellette) 2 slices of bread with butter or/and
1 cup whole wheat porridge	1 cup whole wheat porridge.
1 fruit or raw vegetables	
5 almonds.	

Mid-morning (school snack box)

2 sandwiches or	2 ham or cheese sandwiches or
1 stuffed prantha	1 stuffed parantha



VegetariansNon-VegetariansLunch

Rice one serving or  
 2-3 chappaties  
 1 cup curd  
 1 dal and 1 vegetable  
 (cooked)  
 Salad and fruit

Rice one serving  
 2-3 chappaties  
 1 cup curd  
 1 dal and 1 vegetable  
 (cooked)  
 Salad and fruit

Evening

1 glass milk (8 Ozs.)  
 2 sandwiches or  
 any other snacks either  
 savoury or sweet or both.

1 glass milk (8 Ozs.)  
 2 sandwiches or any  
 other snacks either savoury  
 or sweet or both.

Dinner

2-3 chappaties  
 1 Dal or cheese dish  
 1 vegetable cooked dry  
 salad with sprouted grams  
 or mixed vegetables.  
 1 sweet dish either made  
 with milk or served with  
 cream.

2-3 chappaties  
 1 meat or fish  
 salad with sprouted grams  
 or mixed vegetables  
 1 sweet dish either made  
 with milks or served with  
 cream.

Age - 10-15 yearsBreakfast

1 glass of Milk (8 Ozs.)  
 with ovaltine or drinking  
 chocolate.

1 glass of Milk (8 Ozs.)  
 with ovaltine or drinking  
 chocolate.

Vegetarians

2 stuffed paranthas  
 or  
 2 plain paranthas with  
 some vegetable.  
 1 fruit or raw vegetable  
 or/and  
 1 cup whole wheat porridge  
 or sevian.

Non-vegetarians

1-2 egg (fried, or serambled)  
 2 slices of bread with  
 butter and/or jaw.  
 or  
 2 small paranthas  
 1 fruit or raw vegetable

Lunch

2-4 chappaties  
 1 cup curd  
 1 dal and 1 vegetable  
 generous helpings salad  
 and some fruit or sweet.

2-4 chappaties  
 1 cup curd  
 1 dal and 1 vegetable  
 generous helpings salad  
 and some fruit or sweet.

Evening

Some drink like milk  
 tea, coca or fruit juice  
 and some snacks.

Some drink like milk  
 tea, coca or fruit juice  
 and some snacks.

Dinner

2-4 chappaties or/and rice  
 1 helping vegetable curry  
 (with peas & cheese, etc.)  
 1 helping vegetable rawor  
 cooked. and Sweet.

2-4 chappaties or/and rice  
 1 helping of meat or fish  
 curry.  
 1 helping vegetable or  
 salad.  
 Sweet.

Expectant and Nursing Mothers

Whole Milk	4 cups
Meat, fish & Poultry	1 liberal serving (4 ozs.) Liver desirable at least once a week
Pulses	1 liberal serving of Peas, Pulses, or cottage cheese (8 ozs.) daily
Egg	At least one daily
Fruit	Two or more servings daily 2 medium oranges or 8 ozs. fruit juice or its equivalent. (rich in vitamin C)
Vegetable	Two or more servings of cooked or raw vegetables, these should include dark green leafy vegetables several times during each week in addition some amount of cooked potatoes each day.
Bread & Cereals	2-4 chappaties or 4 slices of bread and 1 helping of rice—depending on the appetite.
Butter or fat	2 tablespoons daily

Packed Lunch Menus for Adults :

<u>Menu I.</u>	3 vegetable cutlets or minced cutlets. 3 sandwiches (with tomatoes or cucumber or mint chutney) A little salad One fruit like Banana or Guava or an orange, etc.
<u>Menu II.</u>	4 small Besan rotis A little seasonal vegetable (like peas and cauliflower or peas and carrots, etc.) A piece of pickle

Some fruit

Menu III. 2 potato puffs

2 slices of bread with butter

Salad of sprouted grams with lemon dressing

A piece of cold meat -

Some sweet like a piece of Besan barfi or carrot barfi.

Menu IV. 2 stuffed toasts with either minced and peas or some vegetables.

Some salad on pieces of raw vegetables like reddish.

Carrots and small tomato -

A piece of sweet or some fruit

Menu V. 2 Hot dogs or 2 Hamburgers/or vegetable or cheese burgers.

Salad and fruit.

Packed Lunch Menus for children

Menu I& 2 sandwiches with either some vegetable or plain butter

1 Puff boiled (sheltd) egg.

Pieces of vegetable for salad  
(reddish and carrots, etc.)

1 piece of sweet like peanut brittle.

Menu II. 2 stuffed paranthas

Some fruit.

Menu III. One/two hot dog or hamburgers.

Salad

Fruit

Menu IV.

2 Ham or any other sandwiches        or

2 Bread rolls with meat or veg. stuffing

Salad and a sweet.

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ILLUSTRATIONS

## ILLUSTRATIONS

- A. A picture showing a child suffering from protein deficiency.
  - B. A picture showing the consequences of protein deficiency in a six months old child.
  - C. A picture showing a girl who has excess fat due to hormonal defects and over-eating.
  - D. A picture showing the consequences of calcium deficiency in little children.
  - E. A picture showing a three months old child suffering from Anemia due to Iron deficiency.
  - F. Pictures showing a women suffering from overactive thyroid resulting in exophthalmic goiter caused by deficiency of Iodine (Gile, the Thyroid Gland). The pictures show the condition of the woman before and after the operation.
  - G. A photograph showing the result of vitamin A deficiency in a child suffering from Xerophthalmia.
  - H. A picture showing a child suffering from advanced rickets.
  - I. A picture showing a case of multiple vitamin deficiency leading to acute Glossitis.
  - J. A picture showing a case of Keratomalacid caused by vitamin A deficiency.
  - K. A picture showing a case of vitamin C deficiency in adults resulting in scurvy.
  - L. A picture showing two men suffering from Dry Beriberi (left) and Wet Beriberi (right) caused by Thiamine deficiency.
  - M. Seven Food Groups.
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*B. A picture showing the consequences of protein deficiency in a six months old child.*



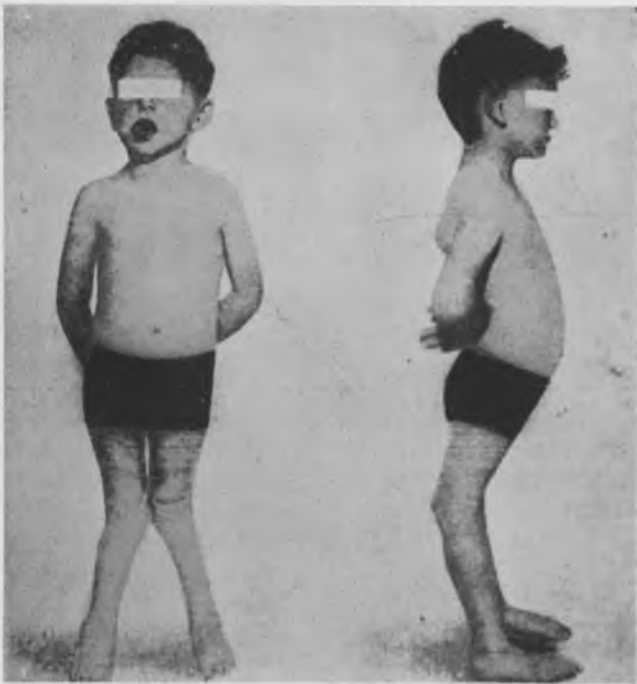
*A. A picture showing a child suffering from protein deficiency.*







**C.** *A picture showing a girl who has excess fat due to hormonal defects and over-eating.*



**D.** *A picture showing the consequences of calcium deficiency in little children.*



**E.** *A picture showing a three months old child suffering from Anemia due to Iron deficiency.*



**F.** *Pictures showing a woman suffering from overactive thyroid resulting in exophthalmic goiter caused by deficiency of Iodine (Gile, the Thyroid Gland). The pictures show the condition of the woman before and after the operation.*





**G.** *A photograph showing the result of vitamin A deficiency in a child suffering from Xerophthalmia.*



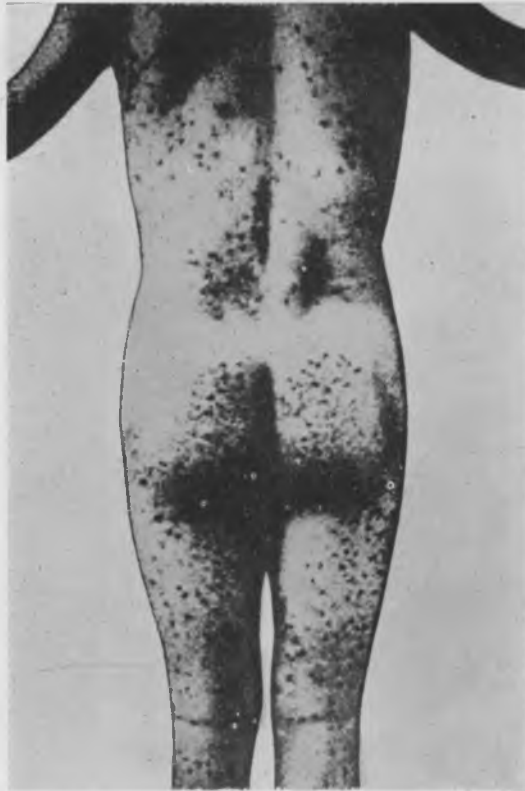
**H.** *A picture showing a child suffering from advanced rickets.*



**I.** *A picture showing a case of multiple vitamin deficiency leading to acute Glossitis.*



J. *A picture showing a case of Keratomalacid caused by vitamin A deficiency.*



**K.** *A picture showing a case of vitamin C deficiency in adults resulting in scurvy.*



**L.** *A picture showing two men suffering from Dry Beriberi (left) and Wet Beriberi (right) caused by Thiamine deficiency.*



m. The seven basic food groups. (U. S. Department of Agriculture)



TABLE OF FOOD VALUES

(Adapted from series No.42 of Nutritive Values developed by the Indian Council of Medical Research)

Sr No	Name of foodstuffs	Nature of edible material	Edible portion %	Per 100 gms of Edible portion										
				Moisture	Protein	Fat	Minerals	Fibre	hydrates	Calories				
				1	2	3	4	5	6	7	8	9	10	11
1		3	4	5	6	7	8	9	10	11				

1	2	3	4	5	6	7	8	9	10	11
<u>CEREALS AND GRAINS</u>										
1.	Wheat flour (refined)	As purchased	100	13.5	11.0	0.9	0.6	0.3	73.9	348
2.	Wheat flour (atta) (Whole)	As purchased	100	12.2	12.1	1.7	2.7	1.9	69.4	341
3.	Wheat (Whole)	As purchased	100	12.8	11.8	1.5	1.5	1.2	71.2	346
4.	Suji	-	-	-	10.4	0.8	-	0.2	74.8	348
5.	Rice, Puffed	As purchased	100	14.7	7.5	0.1	3.8	0.3	73.6	325
6.	Rice, flakes	As purchased	100	12.2	6.6	1.2	2.0	0.7	77.3	346
7.	Rice (Raw, unmilled)	-	-	14.1	7.2	2.3	1.3	-	75.1	350
8.	Rice (Raw, milled)	As purchased	100	13.7	6.8	0.5	0.6	0.2	78.2	345
9.	Rice (Raw, hand-pounded)	-do-	100	13.3	7.5	1.0	0.9	0.6	76.7	346
10.	Rice, Parboiled	As purchased	100	13.3	6.4	0.4	0.7	0.2	79.0	345
11.	Ragi	As purchased	100	13.1	7.3	1.3	2.7	3.6	72.0	328
12.	Maize	Grain only	37	67.1	4.7	0.9	0.8	1.9	24.6	125

1	2	3	4	5	6	7	8	9	10	11
13.	Millet	Dehusked	79	11.2	12.3	4.3	3.3	8.0	60.9	331
14.	Barley	As purchased	100	12.5	11.5	1.3	1.2	3.9	69.6	336
15.	Bajra	Dehusked sample	84	12.4	11.6	5.0	2.3	1.2	67.5	361
<u>PULSES AND LEGUMES</u>										
16.	Bengal Gram (whole)	As purchased	100	9.8	17.1	5.3	3.0	3.9	60.9	360
17.	Bengal Gram (dehusked)	As purchased	100	10.7	22.5	5.2	2.5	1.0	58.1	369
18.	Bengal Gram Dhal	As purchased	100	9.9	20.8	5.6	2.7	1.2	59.8	372
19.	Black Gram Dhal	As purchased	100	10.9	24.0	1.4	3.2	0.9	59.6	347
20.	Green Gram Whole	As purchased	100	10.4	24.0	1.3	3.5	4.1	56.7	334
21.	Green Gram Dhal	As purchased	100	10.1	24.5	1.2	3.5	0.8	59.9	348
22.	Peas, dried	As purchased	100	16.0	19.7	1.1	2.2	4.5	56.5	315
23.	Rajmah	As purchased	-	12.0	22.9	1.3	3.2	-	60.6	346
24.	Rawan	As purchased	-	12.7	23.4	1.3	2.9	-	59.7	344
25.	Red Gram Dhal	As purchased	100	13.4	22.3	1.7	3.5	1.5	57.6	335

1	2	3	4	5	6	7	8	9	10	11
26.	Soya bean	as purchased	100	8.1	43.2	19.5	4.6	3.7	20.9	432
<u>LEAFY VEGETABLES</u>										
27.	amarnath, tender	Leaves and tender stalk	39	85.1	4.0	0.5	2.7	1.0	6.3	46
28.	Bamboo shoots	Tender portion	54	88.8	3.9	0.5	1.1		5.7	43
29.	Bathua leaves			89.6	3.7	0.4	2.6	0.8	2.9	30
30.	Beet greens	Tender leaves	51	86.4	3.4	0.8	2.2	0.7	6.5	46
31.	Brussels Sprouts	as purchased	100	85.5	4.7	0.5	1.0	1.2	7.1	52
32.	Cabbage	all except the hard core	88	91.9	1.8	0.1	0.6	1.0	4.6	27
33.	Carrot leaves	Leaves only	51	76.6	5.1	0.5	2.8	1.9	13.1	77
34.	Cauliflower			80.0	5.9	1.3	3.2	2.0	7.6	66
35.	Celery leaves	Tender leaves only	71	88.0	6.3	0.6	2.1	1.4	1.6	37
36.	Coriander leaves	Leaves & tender stalk	70	86.3	3.3	0.6	2.3	1.2	6.3	44
37.	Curry leaves	Leaves only	83	63.8	6.1	1.0	4.0	6.4	18.7	108
38.	Drumsticks	Leaves only	75	75.9	6.7	1.7	2.3	0.9	12.5	92
39.	Fenugreek	Leaves only	59	86.1	4.4	0.9	1.5	1.1	6.0	49

1	2	3	4	5	6	7	8	9	10	11
40.	Lettuce	Leaves only	66	93.4	2.1	0.3	1.2	0.5	2.5	21
41.	Mint	Tender leaves	45	84.9	4.8	0.6	1.9	2.0	5.8	48
42.	Onion tops			90.3	1.2	0.8	1.0	1.4	5.3	33
43.	Parsley	Young leaves	82	74.6	5.9	1.0	3.2	1.8	13.5	87
44.	Radish tops			90.3	2.7	0.6	2.1	0.9	3.4	30
45.	Spinach	Leaves only	87	92.1	2.0	0.7	1.7	0.6	2.9	26
<u>ROOTS AND TUBERS</u>										
46.	Beet root	all except central stub	85	87.7	1.7	0.1	0.8	0.9	8.8	43
47.	Carrot	all except the stalk	95	86.0	0.9	0.2	1.1	1.2	10.6	48
48.	Potatoes	whole including skin	100	74.7	1.6	0.1	0.6	0.4	22.6	97
49.	Onions			86.8	1.2		0.4	0.6	11.0	49
50.	Radish	all except small rootlets	99	94.4	0.7	0.1	0.6	0.8	3.4	17
51.	Sweet potatoes			68.5	1.2	0.3	1.0	0.8	28.2	120
52.	Tapioca	as purchased	100	12.0	1.3	0.3	2.0	1.8	82.6	338
53.	Turnip	all except hard core	65	91.6	0.5	0.2	0.6	0.9	6.2	29

1	2	3	4	5	6	7	8	9	10	11
54.	Yam			69.9	1.4	0.1	1.6	1.0	26.0	111
	<u>OTHER VEGETABLES</u>									
55.	Beans		59	58.3	7.4	1.0	1.6	1.9	29.8	158
56.	ishgourd	All except outer skin and seeds	67	96.5	0.4	0.1	0.3	0.8	1.9	10
57.	Brinjal	All except stalk & Calyx	91	92.7	1.4	0.3	0.3	1.3	4.0	24
58.	Cauliflower	All except stalk.	70	90.8	2.6	0.4	1.0	1.2	4.0	30
59.	Cucumber	All except the outer coat	83	96.3	0.4	0.1	0.3	0.4	2.5	13
60.	Ladies fingers	All except the tip and the stalk end	84	89.6	1.9	0.2	0.7	1.2	6.4	35
61.	Peas	Pods discarded	53	72.0	7.2	0.1	0.8	4.0	15.9	93
62.	Green tomatoes		98	93.1	1.9	0.1	0.6	0.7	3.6	23
	<u>NUTS AND OIL SEEDS</u>									
63.	Almonds			5.2	20.8	58.9	2.9	1.7	10.5	655
64.	Cashewnuts			5.9	21.2	46.9	2.4	1.3	22.3	596
65.	Coconut dry			4.3	6.8	62.3	1.6	6.6	18.4	662

1	2	3	4	5	6	7	8	9	10	11
66.	Ground nut			7.9	26.7	40.1	1.9	3.1	20.3	549
67.	Pistachio nut			5.6	19.8	53.5	2.8	2.1	16.2	626
68.	Walnut		4.5	4.5	15.6	64.5	1.8	2.6	11.0	686
	<u>CONDIMENTS AND SPICES</u>									
69.	asafoetida		-	16.0	4.0	1.1	7.0	4.1	67.8	207
70.	Cardamom		-	20.0	10.2	2.2	5.4	20.1	42.1	229
71.	Chillies dry		-	10.0	15.9	6.2	6.1	30.2	31.6	246
72.	Cloves dry	As purchased	100	25.2	5.2	8.9	5.2	9.5	46.0	285
73.	Corriander		-	11.2	14.1	16.1	4.4	32.6	21.6	288
74.	Ginger fresh		-	80.9	2.3	0.9	1.2	2.4	12.3	67
75.	Nutmeg		-	14.3	7.5	36.4	1.7	11.6	28.5	472
76.	Pepper dry		95	13.2	11.5	6.8	4.4	14.9	49.2	304
77.	Turmeric		-	13.1	6.3	5.1	3.5	2.6	69.4	349
	<u>F R U I T S</u>									
78.	Apple	All except core & stalk	90	85.2	0.3	0.1	0.3	0.8	13.3	55

1	2	3	4	5	6	7	8	9	10	11
79.	Banana	Peel rejected	74	73.4	1.1	0.1	0.7	-	24.7	104
80.	Cherries	-	88	83.4	1.1	0.5	0.8	0.4	13.8	64
81.	Dates	Seeds rejected	86	15.3	2.5	0.4	2.1	3.9	75.8	317
82.	Figs	-	99	88.1	1.3	0.2	0.6	2.2	7.6	37
83.	Grapes	-	-	82.2	0.6	0.4	0.9	2.8	13.1	58
84.	Guava	As purchased	100	81.7	0.9	0.3	0.7	5.2	11.2	51
85.	Lemon	-	-	85.0	1.0	0.9	0.3	1.7	11.1	57
86.	Lime	-	-	84.6	1.5	1.0	0.7	1.3	10.9	59
87.	Musammi	-	71	88.4	0.8	0.3	0.7	0.5	9.3	43
88.	Malta	-	67	90.3	0.7	0.2	0.4	0.6	7.8	36
89.	Mango	-	85	86.1	0.6	0.1	0.3	1.1	11.8	51
90.	Melon white	-	80	92.8	0.6	0.1	0.6	0.5	5.4	25
91.	Orange	Peel and peels rejected	66	86.2	0.9	0.3	0.6	0.4	11.6	53
92.	Papaya, ripe	-	75	90.8	0.6	0.1	0.5	0.8	7.2	32
93.	Peaches	Flesh and skin	88	86.0	1.2	0.3	0.8	1.2	10.5	50



1	2	3	4	5	6	7	8	9	10	11
94.	Pears	-	85	86.0	0.2	0.1	0.3	1.0	12.4	51
95.	Pineapple		60	87.8	0.4	0.1	0.4	0.5	10.8	46
96.	Plums, red	All except seeds	93	86.3	0.7	0.4	0.5	0.4	11.7	53
97.	Pomegranate	-	68	78.0	1.6	0.1	0.7	5.1	14.5	65
98.	Prunes	-	85	35.3	0.3	0.3	1.7	2.0	60.4	246
99.	Raspberry	-	-	84.8	1.1	0.6	0.9	1.0	11.6	56
100.	Tomatoes		100	94.0	0.9	0.2	0.5	0.8	3.6	20
101.	Strawberry		96	87.8	0.7	0.2	0.4	1.1	9.8	44
<u>F.I S H E R</u>										
102.	Bhetki	-	-	82.0	13.7	1.1	1.2	-	2.0	73
103.	Chela	-	-	77.5	14.6	4.3	2.1	-	1.5	103
104.	Hilsa	Fleshy portion	-	53.7	21.8	19.4	2.2	-	2.9	273
105.	Indian herring	do	50	72.8	20.3	3.2	1.5	-	2.2	119
106.	Oil Sardine	Flesh only	70	76.5	19.6	2.0	1.8	-	0.1	97
107.	Lobster		-	77.3	20.5	0.9	1.4	-	0	90

1	2	3	4	5	6	7	8	9	10	11
108.	Mackerel	Flesh only	61	77.3	18.9	1.7	1.6	-	0.5	93
109.	Pomphret	-	68	78.4	17.0	1.3	1.5	-	1.8	87
110.	Prawns	-	-	77.9	20.8	0.3	1.4	-	0	86
111.	Romu	Flesh only	78	76.7	16.6	1.4	0.9	-	4.4	97
112.	Sardines	Flesh only	49	78.3	18.2	0.2	2.1	-	1.2	79
113.	Singhada	Flesh only	58	61.0	20.9	3.1	1.1	-	13.9	167
114.	Sole	All except viscera	100	78.0	19.5	4.7	3.1	-	-	120
115.	Bombay Duck	-	-	16.7	61.7	4.0	15.1	-	2.5	293
<u>OTHER FLESH FOODS</u>										
116.	Beef	-	-	74.3	22.6	2.6	1.0	-	-	114
117.	Duck	-	-	72.3	21.6	4.8	1.2	-	0.1	130
118.	Egg, ducks	-	-	71.0	13.5	13.7	1.0	-	0.8	181
119.	Eggs, hens	-	-	73.7	13.3	13.3	1.0	-	-	173
120.	Fowl	-	-	72.2	25.9	0.6	1.3	-	-	109
121.	Goat	-	-	74.2	21.4	3.6	1.1	-	-	118

1	2	3	4	5	6	7	8	9	10	11
122.	Liver	-	-	76.3	20.0	3.0	1.3	-	-	107
123.	Mutton	-	-	71.5	18.5	13.3	1.3	-	-	194
124.	Pork	-	-	77.4	18.7	4.4	1.0	-	-	114
<u>FATS AND EDIBLE OILS</u>										
125.	Butter	-	100	19.0	-	81.0	2.5	-	-	729
126.	Ghee	-	100	-	-	100	-	-	-	900
127.	Vegetable cooking oil	-	100	-	-	100	-	-	-	900
128.	Vanaspati (Hydrogenated oil)	-	100	-	-	100	-	-	-	900
<u>MILK AND MILK PRODUCTS</u>										
129.	Cow's milk	-	100	87.5	3.2	4.1	0.8	-	4.4	67
130.	Buffalo's milk	-	100	81.0	4.3	8.8	0.8	-	5.1	117
131.	Curds	-	100	89.1	3.1	4.0	0.8	-	3.0	60
132.	Cheese	-	100	40.3	24.1	25.1	4.2	-	6.3	348

TABLE OF FOOD VALUES

(Adapted from series No.42 of Nutritive Values developed by the Indian Council of Medical Research)

Sr. No.	Name of foodstuff	Nature of edible material	3	4	5	6	7	8	9	Per 100 gms of Edible portion		Calories
										Fibre	Carbohydrates	
1	2											11
<u>MISCELLANEOUS FOODSTUFFS</u>												
133.	Bread, white	-	-	-	7.8	0.7	-	0.2	-	51.9	245	
134.	Bread, brown	-	-	-	8.8	1.4	-	1.2	-	49.0	244	
135.	Cane Sugar	-	100	0.4	0.1	-	0.1	-	-	99.4	398	
136.	Honey	-	-	20.0	0.3	0	0.2	-	-	79.5	319	
137.	Jaggery	-	-	3.9	0.4	0.1	0.6	-	-	95.0	383	
138.	Sago	-	-	12.2	0.2	0.2	0.3	-	-	87.1	351	
139.	Yeast, dried (food)	-	-	7.8	35.7	1.8	8.4	-	-	46.3	344	
140.	Yeast, dried (Brewer's)	-	-	13.6	39.5	0.6	7.0	0.2	-	39.1	320	

TABLE OF FOOD VALUES      MINERALS AND VITAMINS

1	X	Serial No.
2	X	Name of the Food Stuff
3	X	Calcium, mg
4	X	Magnesium, mg
5	X	Oxalic acid, mg
6	X	Phosphorus, mg
7	X	Iron, mg
8	X	Vitamin A, I.U.
9	X	Thiamine, mg
10	X	Riboflavin, mg
11	X	Nicotinic acid mg.
12	X	Vitamin C. mg
13	X	Vitamin K.

1	2	3	4	5	6	7	8	9	10	11	12	13
1	Wheat flour refined(Maida)	23	42	6	121	2.5	43	0.12	0.07	0.9	0	0
2	Wheat flour Atta	48	55	26	423	11.5	49	0.49	0.29	4.3	0	0
3	Whole Wheat	41	138	8	306	4.9	108	0.45	0.12	5.0	0	0
4	Suji	16			102	1.6	-	0.12	-	1.2	-	-
5	Rice puffed	23	82	0	150	6.6	0	0.21	0.12	4.1	0	0
6	Rice flakes	20	101	0	238	20.0	0	0.21	0.05	4.0	0	0
7	Rice Raw milled	10	48	3	160	3.1	0	0.06	0.06	1.9	0	0
8	Rice raw hand pounded	10			190	3.2	4	0.21	0.16	3.9	0	0
9	Maize	10	144	6	348	2.0	150	0.42	0.10	1.4	0	0
10	Millet	31	120	0	290	12.9	54	0.59	0.08	0.7	0	0
11	Barley	26	127	2	215	3.0	7	0.47	0.20	5.4	0	0
12	Bajra	42	125	21	296	13.3	220	0.33	0.16	3.2	0	0

PULSES AND LEGUMES

1	2	3	4	5	6	7	8	9	10	11	12	13
13	Bengal gram whole.	202	168	2	312	10.2	316	0.30	0.51	2.1	3	0.29
14	Bengal gram dhal	56	138	5	331	9.1	216	0.48	0.18	2.4	1	
15	Green gram whole	124	171	3	326	7.3	158	0.47	0.39	2.1	1	0.30
16	Green gram dhal	75	189	1	405	8.5	83	0.72	0.15	2.4	0	
17	Peas dried	75	125	0	298	5.1	66	0.47	0.38	1.9	0	0.15
18	Rajmah	260	-	-	410	5.8						
19	Rawan	80			430	4.3						
20	Soyabean	240			690	11.5	710	0.73	0.76	2.4		

LEAFY VEGETABLES

21	Bamboo sheets	20	32	2	65	0.1	0	0.08	0.19	0.2	5	
22	Beet greens	380	-	-	30	16.2	9770	0.26	0.56	3.3	70	
23	Brussel sprouts	43	26	4	82	1.8	210	0.05	0.16	0.4	72	

1	2	3	4	5	6	7	8	9	10	11	12	13
24	Cabbage	39	10	3	44	0.8	2,000	0.06	0.03	0.4	124	
25	Corriendie leaves	184	64	47	71	18.5	11,530	0.05	0.06	0.8	135	
26	Drumstick leaves	440	24	101	70	7.0	11,300	0.06	0.05	0.8	220	
27	Lettuce	50	30	-	28	2.4	1,650	0.09	0.13	0.5	10	
28	Mint	200	-	23	62	15.6	2,700	0.05	0.08	0.4	27	
29	Onion tops	78	-	-	14							
30	Parsley	390			175	17.9	3,200	0.04	0.18	0.5	281	
31	Spinach	73	84	658	21	10.9	9,300	0.03	0.07	0.5	28	
<u>ROOTS AND TUBERS</u>												
32	Beet root	200	9	40	55	1.0	0	0.04	0.09	0.4	88	
33	Carrot	80	14	5	50	2.2	3,150	0.04	0.02	0.6	3	
34	Onion	180	-	-	50	0.7	0	0.08	0.01	0.4	11	
35	Potato	10	20	20	40	0.7	40	0.10	0.01	1.2	17	
36	Radish	50	-	9	22	0.4	5	0.06	0.02	0.5	15	



I	Y	2	3	4	5	6	7	8	9	10	11	12	13
37	Sweet Potato	20	-	50	0.8	10	0.08	0.04	0.7	24			
38	Tapioca	50	17	40	0.9	-	0.05	0.10	0.3	25			
39	Turnip	30	-	40	0.4	0	0.04	0.04	0.5	43			
40	Yam	60	-	20	1.3	130	0.07	0	0.7				
<u>OTHER VEGETABLES</u>													
41	Ashgourd	30	-	20	0.6	0	0.06	0.01	0.4	1.			
42	Beans	50		160	2.6	57	0.34	0.19	0	27			
43	Brinjal	18	16	47	0.9	124	0.04	0.11	0.9	12			
44	Cauliflower	33	20	57	1.5	51	0.04	0.10	1.0	56			
45	Cucumber	10	11	25	1.5	0	0.03	0.01	0.2	7			
46	Drumsticks	30	24	110	5.3	184	0.05	0.07	0.2	120			
47	Ladies Finger	66	43	56	1.5	88	0.07	0.10	0.6	13			
48	Peas	20	34	139	1.5	139	0.25	0.01	0.8	9			

1	Y	2	Y	3	Y	4	Y	5	Y	6	Y	7	Y	8	Y	9	Y	10	Y	11	Y	12	Y	13
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49	Pumpkin	10	14	-	30	0.7	84	0.06	0.04	0.5	2
50	Green tomatoes	20	15	2	36	1.8	320	0.07	0.01	0.4	31

NUTS AND OIL SEEDS

51	Almonds	230	-	407	490	4.5	0	0.24	0.15	2.5	0
52	Cashewnuts	50	-	318	450	5.0	100	0.63	0.19	2.1	0
53	Coconut dry	400	-	-	210	2.7	0	0.08	0.06	0.6	7
54	Groundnut	50	-	-	390	1.6	63	0.90	0.30	14.1	0
55	Pista Chionuts	140	-	-	430	13.7	240	0.67	0.03	1.4	0
56	Walnut	100	-	-	380	4.8	10	0.45	0.12	1.6	0

CONDIMENTS AND SPICES ETC.

57	Asafoetida	690	-	-	50	22.2	8	0	0.04	0.3	0
58	Cardamom	130	-	-	160	5.0	0	0.22	0.17	0.8	0
59	Chillies Green	30	24	67	80	1.2	292	0.19	0.39	0.9	111
60	Flaves	740	-	-	100	4.9	422	0.08	0.13	0	0

1	2	3	4	5	6	7	8	9	10	11	12	13
61	Coriander	630	-	-	393	17.9	1,570	0.22	0.35	1.1	0	
62	Cumin seeds	1080	-	-	511	31.0	870	0.55	0.36	2.6	3	
63	Garlic dry	30	-	-	310	1.3	0	0.06	0.23	0.4	13	
64	Ginger fresh	20	-	-	60	2.6	67	0.06	0.03	0.6	6	
65	Nutmeg	120	-	-	240	4.6	0	0.33	0.01	1.4	0	
66	Tamarind	170	-	-	110	10.9	100	-	0.07	0.7	3	
67	Turmeric	150	-	-	282	18.6	50	0.03	0	2.3	0	

FRUITS AND FRUIT PRODUCTS

68	Apple	9	7	10	20	1.0	0	0.12	0.03	0.2	2	
69	Apricots fresh	20	-	-	25	2.2	3,600	0.04	0.13	0.6	6	
70	Banana	10	34	2	30	0.5	124	0.05	0.17	0.3	6	
71	Cherries red	24	-	-	25	1.3	0	0.08	0.08	0.3	7	
72	Gurrants black	130	-	-	110	8.5	35	0.03	0.14	0.4	1	

1	2	3	4	5	6	7	8	9	10	11	12	13
73	Dates dried	120	-	-	50	7.3	44	0.01	0.02	0.9	3	
74	Figs	60	-	-	30	1.2	270	0.06	0.05	0.6	5	
75	Grapes	20	-	5	23	1.3	5	0.04	0.01	0.1	1	
76	Grape fruit	20	-	-	20	0.2	-	0.12	0.02	0.3	31	
77	Guava	10	8	14	28	1.4	0	0.03	0.03	0.4	212	
78	Prune	10	-	-	18	-	-	-	-	-	-	
79	Jack fruit	20	27	27	41	0.5	292	0.03	0.13	0.4	7	
80	Lemon sour	100	-	-	20	0.7	0	-	-	0.1	26	
81	Lemon sweet	30	-	-	20	0.7	0	-	-	0	45	
82	Lemon	70	-	-	10	2.3	0	0.02	0.01	0.1	39	
83	Lime	90	-	-	20	0.3	26	-	-	-	-	
84	Musambi	40	-	-	30	0.3	0	-	-	0	50	
85	Malta	45	-	-	22	0.7	0	-	-	0	54	

	1	2	3	4	5	6	7	8	9	10	11	12	13
86	Mango	10	27	26	20	0.3	4,800	0.04	0.05	0.05	0.3	13	
87	Melon musk	65	31	2	20	1.3	0	0.02	0.04	0.1	1		
88	Melon white	15	-	-	10	2.0	130	-	-	0.1	29		
89	Mulberry	60	-	-	20	2.6	174	0.01	0.18	0.8	13		
90	Orange	50	9	10	20	0.1	1,800	-	-	0	30		
91	Papayya	17	11	1	13	0.5	1,110	0.04	0.25	0.2	57		
92	Peaches	15	21	1	41	2.4	0	0.02	0.03	0.5	6		
93	Pears	6	7	4	10	1.0	14	0.02	0.03	0.2	0		
94	Pineapple	20	20	5	9	1.2	30	0.20	0.12	0.1	39		
95	Plums red	15	147	1	25	0.8	166	-	-	0.1	0		
96	Pomegranate	10	12	14	70	0.3	0	0.06	0.10	0.3	14		
97	Prunes	80	-	-	40	4.8	317	0.56	-	1.6	2		
98	Raspberry	40	-	-	110	2.3	2,080	-	-	0.8	30		
99	Strawberry	30	-	-	130	1.8	30	0.03	0.02	0.2	52		

I	Y	2	3	Y	4	Y	5	Y	6	Y	7	Y	8	Y	9	Y	10	Y	11	Y	12	Y	13
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100	Tomato Ripe	48	12	4	20	0.4	585	0.12	0.06	0.4	27
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FISH (FRESH AND SUN-DRIED)

101	Fish Bhetki	530	-	-	400	1.0	-	-	-	0.7	10
102	Chela	590	-	-	340	2.0	-	-	-	-	-
103	Hilsa	180	-	-	280	2.1	-	-	-	0.8	24
104	Indian Herring	429	-	-	305	9.3	-	-	-	-	-
105	Lobster	16	-	-	297	-	-	-	-	-	-
106	Mackerel	429	-	-	305	4.5	-	-	-	-	-
107	Oil Sardine	357	-	-	349	6.1	-	-	-	-	-
108	Panfrets	200	-	-	290	0.9	-	-	0.55	2.6	-
109	Prawn	90	-	-	240	0.8	0	0.01	0.10	48	-
110	Rohu	680	13	5	150	0.9	-	0.05	0.07	0.7	20
111	Sardines	90	-	-	360	2.5	-	-	-	2.6	-
112	Singhada	100	-	-	150	1.8	-	-	-	-	-

1	2	3	4	5	6	7	8	9	10	11	12	1
113	Sole	140			95	0.5	-	-	-	0.5	9	
114	Bombay duck	1389			240	19.1						
<u>OTHER FLESH FOOD</u>												
115	Beef	68	186		324	18.8	60	0.15	0.04	6.4	2	
116	Duck	4	-	-	235							
117	Egg, duck	70			260	3.0	1,200	0.12	0.28	0.2	-	
118	Egg, hen	60			220	2.1	1,200	0.10	0.18	0.1	0	
119	Fowl	25			245							
120	Goat	12			193							
121	Liver	17			297							
122	Mutton	150		7	150	2.5	31	0.18	0.27	6.8	-	
123	Pork	30			200	2.2	0	0.54	0.09	2.8	2	

TABLE OF FOOD VALUES - MINERALS AND VITAMINS

Serial No.	Name of the Foodstuff	1	2	3	4	5	6	7	8	9	10	11	12	13
		Calcium, Mg.	Magnesium, mg.	Oxalic acid, mg.	Phosphorus, mg.	Iron, mg.	Vitamin A, I.U.	Thiamine, mg.	Riboflavin, mg.	Nicotinic acid, mg.	Vitamin C, mg.	Vitamin K		

MILK AND MILK PRODUCTS

124	Cow's milk	120	2	90	0.2	174	0.05	0.19	0.1	2			
125	Buffalo's milk	210	130	0.2	160	0.04	0.10	0.1	1				
126	Curds	149	93	0.3	102	0.05	0.16	0.1	1				
127	Cheese	790	520	2.1	273	-	-	-	-				

MISCELLANEOUS FOODSTUFFS

128	Canesugar	12	-	1	-	-	-	-	-	4			
129	Honey	5	-	16	0.9	0	0	0.04	0.2	0			
130	Jaggery	80	-	40	11.4	0	0.02	-	1.0	0			
131	Yeast dried(food)	160	2090	21.5	-	3.20	-	27.0	-	-			
132	Yeast dried Brewers	440	1490	43.7	0	6.00	4.00	40.0	-	-			