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CHAPTER – 4

FOOD AND NUTRITION

4.1 Introduction

Few subjects are more important to public health than food. One of the major ways in which humans interact with their environment is through our food. The science of nutrition has developed through the study of the components of foods that are required to sustain life and to maintain health. Improper diet can cause disease if important nutrients are missing from the diet, and inappropriate dietary practices can increase the risk of certain diseases.

Food is any substance consumed to provide nutritional support for the body. It is usually of plant or animal origin, and contains essential nutrients, such as carbohydrates, fats, proteins, vitamins, or minerals. The substance is ingested by an organism and assimilated by the organism's cells in an effort to produce energy, maintain life, or stimulate growth.

4.2 Meaning and Definition

Food is made up of any substance, composed of carbohydrates, water, proteins and fats either eaten or drunk by any animal; including humans to give energy or help build up the body for growth.

4.3 Definition of Food

Food is one of those perplexing issues that seems to drive so much debate and controversy. Over the last 100 years society has been led to believe that apart from supplying basic energy, food has very little bearing on physical and mental health.
4.4 Definition of Nutrition

Nutrition is the process in which you consume food or nourishing liquids, digest and absorb them and use them for health and growth.

4.5 Protect Women's Health and Nutritional Status

Good health and adequate nutrition are important to women at all stages of their lives. Women need to protect their own health and nutritional status to be able to fulfill their productive and reproductive roles. In targeting appropriate development or safety net programs toward women, the focus should be on those that increase women's income-earning potential while reducing the energy or time intensity of their activities. Such efforts should also be supported by programs addressing girls' and women's specific health needs—especially in relation to puberty, pregnancy, and lactation. These include programs to relieve iron deficiency anemia, vitamin A and iodine deficiencies, general reproductive health care, and pre- and postnatal care. Lastly, women need to be empowered to seek health care for themselves and for those who depend on them for food and nutrition security.

4.6 Elements of Human Nutrition

Energy, most of the food consumed is used by the body to supply energy. The body is able to digest and absorb into the blood stream components of carbohydrates, fats, and protein that can be metabolized by the body to release energy. Energy is used to maintain body temperature, support metabolic processes, and to support physical activity. People are generally in a state of energy balance, that is, they consume as much energy as they use to support their bodies and daily living. They tend to gain weight if they are in positive energy balance, or lose weight if they take in less than they expend. Most excess energy is stored by the body as fat. Energy needs are usually expressed in
kilocalories, but in much of the world's scientific literature, energy expenditure is expressed in joules or kilojoules (1 kilocalorie equals 4.184 kilojoules).

The energy expended by the body when at rest is quite constant between individuals and can be estimated quite closely by prediction equations that take into account age, sex, and body weight. The resting metabolic weight of a 70-kilogram (154-lb.) man, for example, is estimated to be 1750 kilocalories per day, and for a 58-kilogram (128-lb.) woman, 1350 kilocalories per day. The total daily energy needs are related to the amount of physical activity expended in the course of everyday life. A person whose life style involves light amounts of activity may have a total energy expenditure of about one and one-half times their resting metabolic rate, while a person who is engaged in very intense physical activity may expend over twice as much energy as their resting metabolic rate in the course of twenty-four hours.

- **Protein**

  The principal structural components of body soft tissues are proteins, which are made by the body from amino acids. The amino acids along with the nucleic acids are the principle nitrogen-containing components of the body and of most foods. The enzymes that regulate most body processes are also proteins. The body can synthesize many of the amino acids needed for protein syntheses, but some amino acids must be obtained from the proteins in the diet. The dietary essential amino acids for humans are threonine, valine, leucine, isoleucine, methionine, lysine, histidine, and tryptophan. Two others can only be formed from essential amino acids: tyrosine from phenylalanine, and cystine from methionine. Human dietary protein requirements are quite modest. An adult man of average weight is estimated to need about sixty-three grams of protein per day, while an average woman is
estimated to need about fifty grams. The protein must supply the essential amino acids required by humans and sufficient total nitrogen to allow syntheses of the other amino acids required for protein synthesis.

- **Fats**

  Fats are synthesized from carbohydrates, but the body is unable to make certain fatty acids, which are components of fats. These essential fatty acids, notably linoleic and linolenic acid, must be supplied by dietary fats. Fats that are solid at room temperature, such as butter or lard, usually contain high amounts of saturated fatty acids such as palmitic or stearic acid. Fats that are liquid at room temperature such as vegetable oils are higher in unsaturated fatty acids, which include oleic acid as well as the linoleic and linolenic acid. Fat is the most concentrated source of energy available to humans, supplying about nine kilocalories per gram of dietary fat, compared to four kilocalories per gram of carbohydrate and protein. Fat is also the principal storage form of energy in the body.

- **Vitamins**

  Vitamins are a diverse group of dietary essentials that have important functions in the body. The vitamins known to be required by humans are listed in Table 2. Many of them are components of co-enzymes, molecules that are required for some enzymes to carry out certain metabolic processes. Others, such as vitamin E and vitamin C, act as antioxidants, protecting body components from damage from oxygen needed by the body for metabolism. Some are more like hormones, such as vitamin D, which regulates the absorption of calcium from the intestine and the formation of bones. Vitamin D can actually be formed by the action of ultraviolet light from the sun on vitamin D.
precursors found in the skin, but since this synthesis may not be sufficient at times, humans need a dietary source of vitamin D. Vitamin A is a component of visual pigments in the eye that respond to light stimuli and are essential for sight.

- **Inorganic elements**

Humans also require several inorganic elements as components of the diet. The inorganic elements known to be required by humans are listed in Table 2. These elements may have a structural function, such as calcium and phosphorus, which are needed for bone synthesis, or they may have a catalytic function similar to some of the vitamins. They are required for the action of many enzymes in the body. Sodium and potassium are essential for fluid balance. Iodine is an essential component of thyroxin, the hormone produced by the thyroid gland. Some of the inorganic elements are required in extremely small quantities, only micrograms per day, while other elements may be needed in higher amounts. Soils vary in their content of some of the trace elements, and plants grown in some areas may be deficient in an essential element. This has been true for iodine, where a deficiency is still observed in many areas of the world, and selenium, where geoChartically based human deficiency disease has been observed.

4.7 Women and Nutrition in India

India is a country of rich natural resources and talented human resources and yet its dream of becoming self sufficient and considered a `developed country' rather than a `developing country' seems a distant reality due to the complexity of its problems.

Majority of Indian population lives in rural areas. (72% rural as compared to 28% urban population) where the pace of progress in
literacy, education, employment and technology is slow; urban areas get the maximum benefits of the progress.

The patriarchal system prevalent in India (except in one state) makes women the worst victims of poverty as their multifaceted responsibilities include that of a career, giver and a protector. Women are socialized to be self sacrificing from childhood onwards to give first and take only if somebody chooses to give or if there is something extra to give.

Indian social customs and traditions dictates differential attitudes, behaviour and practices related to their food entitlements - girl babies tend to be breast fed for shorter periods of time and as they get older receive smaller portions of food, particularly quality foods, e.g. milk, fruits and vegetables, than that of boys. From a very early age itself, girls are taught to deny themselves of their own needs. When serving food, women serve larger portions to their husbands and male children first only then do they feed their female children and they tend to ignore the importance of their own food requirements.

In the Indian context, due to the patriarchal set up. Women are also expected to follow several social and religious rituals, which limit their food intake without reducing her work load. In addition, Indian women are socialized to eat less, last, the least and leftovers. This gender discrimination begins in childhood itself, which is further compounded by food taboos, and religious beliefs.

- **Cooking Food "Are Women Decision Makers or Victims"**

In India it is commonly believed that since women generally cook the food at home they are the decision makers on what to cook and what to eat. In some families they are also called "Queen of the
kitchen”. However on deeper probing, we realize that while women are only doing the labor of cooking, the decision of what to cook is generally made by the choices of their husbands or families. This is amplified by the women who report that “when my husband is away, I feel tired to cook, and do not cook a full meal”. This clearly indicates that the food choices are male dominated and the women do not exercise their right of cooking food of her choice. This is true of women from all classes, caste and creed. In some Indian communities, the men also purchase the food thereby ensuring that whatever food is cooked at home is of their choice.

- **Over work**

Over work has the severest consequence in women during the child-bearing years. Typically women work until late in their pregnancy depriving them of adequate food and rest, at a time when their nutritional requirements are the highest. This leads to a situation in which most women become anaemic, placing them at high risk of unsafe delivery. If the women do survive the childbirth, she has to immediately start her domestic and productive tasks, before she has adequate time to rest and recuperate. In addition several restrictions are put on women as a result of food taboos which grossly affect women's decision about food intake particularly during menstruation, pregnancy and lactation. Some existing food taboos and myths are given below.

<table>
<thead>
<tr>
<th>Taboos</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the mother eats more food during pregnancy the child gets crushed in the womb.</td>
<td>Lack of information regarding the anatomy of the human body, thereby restrict women to have adequate food leading to leading to poor nutritional/health status.</td>
</tr>
</tbody>
</table>
The pregnant woman would pass green stools if she eats green leafy vegetables. These get stuck inside the intestine of the child. Women are thus deprived of green leaves, which contribute to the content of iron, a vital component, in a vegetarian diet.

Eating peanuts makes the placenta rot and the child gets a white layer on her/his body. Protein needed for the formation of haemoglobin is thereby lost.

Consumption of banana and ghee causes the baby to stick in the uterus. The women are deprived of calcium and energy.

Curds, butter, milk, lemon and citrus fruits lead to Oedema and Arthritis. Women become deficient in vitamin C, which is essential for blood formation.

Non-vegetarian food is hot. Women are convinced to eat a vegetarian diet, which might be deficient in iron content.

Pregnant women should not eat pulses as they cause gastric trouble in the stomach. Thus women's diet remains deficient in protein.

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Table 4.1

### 4.8 Relation of Food to Health

Food is essential for human existence just like the air. We breathe or the water we drink. The food that we eat is utilized in the body and the assimilated substance is used for the growth and maintenance of tissues.

The health of a person depends on the types and quantity of food stuff he chooses to make his diet. Diet should be planned according to the primeiples of nutrition.
The effect of food on our body is explained in nutrition. Nutrition is defined as food at work in the body. Nutrients are defined as the constituents of food which help us to maintain our body functions to grow and to protect our organs. There are six major nutrients in our body. They are carbohydrates, proteins, lipids, vitamins and minerals. The human body requires 17 vitamins and 24 mineral elements for various day to day activities. The composition of human body is 60-70 percent water, 17 percent proteins, 14 percent fat, 6 percent minerals and 1 percent carbohydrates. In infants the percentage of water is more as compared to an adult. In women water content is slightly lower whereas fat content is more than in man. Fat deposition in the body increases with age.

4.9 Nutrition Problem

In the past four years much concern has been expressed about the nutritional status of segments of the population in the united states. As a result, in the late 1967, congress directed the department of Health, Education and welfare to conduct a National Nutrition survey.

The stages in nutrition planning are not always sequential, clear cut or well ordered. The absence of on overran framework means that objectives are unclear and projects get accepted through the pressures of Individuals and research institutes rather and implements programs to meet them.

The first stage in the planning sequence should be to identify the malnourished groups determine why they are malnourished. What the nutritional deficiencies are and their severity and alternative programmers relevant to the need of the malnourished.
Problem Identification

- Problem identification enables the planner to pinpoint the need, identify the type and cause of nutritional deficiencies.
- Locate the population groups which are affected and measure the severity of malnutrition.
- To access the problem, nutrition it's largely employ nutritional parameters and provide data on food expenditure.
- Planners typically identify population groups as malnourished on the basis of age physiological status.
- Traditionally the 'valmerable' groups are preschool children, pregnant women and lactating mothers but this classification is unsatisfactory since we cannot assume for example that all preschool children are suffering from protein calorie malnutrition.
- The amount of nutrient that diffuse into solution can be limited by the following steps :-
  1) Keep the surface area of the food small.
  2) This is easily achieved by leaving the food whole in large pieces.
  3) Decrease the amount of water to which the foods exposed.
  4) Steaming can greatly reduce solution losses while minimizing danger of scorching.
  5) Decrease the length of time the food is exposed to the water, vegetables that are cooked just tender vetain more nutriments, color and flavor than vegetables that are overcooked, pressure cooking, shortcuts cooking time.
  6) Avoid changing the water in which the food is cooked.
  7) Avoid soaking value, cut up vegetables or fruits in water for a period of time before cooking.
1. Malnutrition

There are several important forms of malnutrition, when the body is not supplied with the correct amounts of certain nutrients. In developing countries the problem is usually due to a deficiency but in developed countries there are often cases who suffer from too much food and develop diseases as a result.

Malnutrition at its fundamental biologic level is inadequate supply of nutrients to the cell. A lack of essential nutrients at the cellular level, however, is the result of a complex web of factors psychological, personal, social cultural, economic, political and educational [each of these factors is more or less important cause of malnutrition at a given time and place, for a given individual.]

If these variables are only temporarily adverse, the malnutrition may be acute and may be alleviated rapidly, leasing no land standing results or harm to life. But if these variables are continuously adverse and unrelieved, malnutrition becomes chronic. Inseparable harm to life follows and eventually death ensues.

2. Lack of protein and energy food

Protein energy malnutrition (PEM) is the biggest problem in developing countries. It usually affects children in the first 4 years of life while they are growing rapidly. During this period they have a relatively greater need for protein and energy than adults, and yet they are usually fed on the same diet as their parents or they may, in fact, be given less of the foods, which are often reserved for father.

3. Kwashiorkor

In kwashiorkor there is lack of protein and also not enough energy is supplied, the child shows retarded growth, reomda, apathy,
hair changes, and loss of appetite. Kwashiorkor often starts with a slowing of the growth of the child at the time of weaning in the second year of life. The mother's supply of breast milk is withdrawn, and most of the protein and energy in the diet may come from a bulky of diluted staple which, if it is plantain or yam, would only contain 1 per cent protein. The acute phase of kwashiorkor, with swelling and skin rash, loss of appetite and apathy, can be precipitated or hastened by infections such as whooping cough, measles, tuberculosis, or by parasitic infections with malaria, hookworm, or roundworm. Sometimes an event in the family is a cause of the poor diet, for example death of the father or mother, or loss of a job, or movement to a new home, where the crops are not ready. Other causes are the local weaning customs, which might mean that a child is sent to a relative of the mother because she is pregnant again. Then he is not well cared for and becomes unhappy, and loses his appetite from being off his mother's breast.

4. Protein energy malnutrition

The most common form of malnutrition occurs when the child does not eat sufficient food for normal growth. Such a child is often thought to be normal but when measured is found to be well below average. If the under nutrition is acute, as in a bad harvest season, then the child will be thin (or wasted) for height-as is shown by weight for height measurements. If insufficient food is given to the child over a long period of time (chronic malnutrition) the child will be stunted as shown by low height (or length) for age. Many children are both stunted and underweight for their age. These forms of malnutrition are recognized by weighing and measuring infants and plotting their growth on a growth chart. Malnutrition is important as it is common, often unrecognized, and may be associated with more serious infections and
even death, e.g. from diarrhea, pneumonia, or measles. In many developing countries a third of the children in the first 3 to 4 years of life may suffer from mild PEM and so the following activities are needed:

- Regular weighing
- Supplementary feeding
- Preparation of cheap home weaning foods
- Prolonged breast-feeding
- Distribution of specific nutrients
- Applied nutrition programmes
- Better marketing of foods
- Nutritional education
- Nutritional rehabilitation
- Prevention of infections and early oral rehydration for diarrhea

5. **Marasmus**

This is another form of PEM in which there is a general lack of food and the baby does not get enough calories or protein. In adults it is usually just called starvation. In adults it often occurs in the first year of life, the body is very grossly underweight, and the baby looks like a little, shrunken old man. There are no hair changes and the baby is hungry. One cause of marasmus is death of the mother, with subsequent loss of milk and good care. Another is early weaning onto bottle-feeding—as this is expensive the milk feeds are diluted and they are often prepared unhygienically. The baby is therefore starved and also has diarrhea periodically.
Nutritional deficiency diseases

On a biologic level, nutritional deficiency disease may be classified as primary or secondary according to the availability of the nutrition.

Primary deficiency disease

A primary deficiency disease is a disease that results directly from dietary lack of a specific essential nutrient. For example, a scurvy results if the diet is deficient in vitamin C, beriberi results in the diet is deficient in the main.

Secondary deficiency disease

A secondary deficiency disease is a disease that results from the inability of the body to use a specific nutrient properly. Such inability may result from either or two general types of failure.

- Failure to absorb the nutrient from the alimentary tract into the blood.
- Failure to metabolize the nutrient normally after it has been absorbed. For example, the malab sorption syndrome is characterized by failure of absorption of fats through the intestinal wall, so that fat is lost in the stool. Phenylketonari is the inability of the body to metabolize the essential amino acid phenyl nine, so that phenylalanine is lost in the urine secondary deficiency disease.

The ecology of malnutrition

The word "Ecology" from a Greek word oikos meaning "house" just as there are many factors and forces within a family's house that interact to influence its members, so there is an even vaster complex of
interrelated forces house in a biologic system that produces disease. Many factors work together to produce malnutrition.

A disease caused by malnutrition may exist in many varieties, many degrees, and many combinations. Often have been complicated by the presence of other disease such as tuberculosis, intestinal parasites or skin sepsis. A synergism is, in fact, know to exist between malnutrition and infection.

Each compounds the other and together they cause more serious illness than either would bring alone. For example, a common infection disease of childhood such as measles which would otherwise be mild in a severely malnourished child may cause death.

Infectious diarrhea is a common complication of kwashiorkor and may be the irreversible factor that causes death. Some of the many related cause of malnutrition can be caused under the three factors that are classically cited by the epidemiologist as the trial of the variables that influences disease.

- **Effecting factors of malnutrition**

  - **Personal Factors**

    Ignorance of food needs food values, carelessness lack of education, emotional problems, indolence, poor habits and anoxeria influence the kind and amount of food consumed.

  - **Environment**

    Many environment factors influence malnutrition. Some are close at hand and may be controlled by the individual. Many more far-reaching ones are too enormous too powerful, and too remote in their source to be influenced by a single person. Mass action and extensive
are needed to deal with those problems. The following are some of the environmental problems.

- **Sanitation**
  
  Food contamination causes food loss and produces disease thus compounding malnutrition.

- **Culture**
  
  Traditional food habit and customs may hinder nutrition.

- **Social Factors**
  
  Interrelated social problems such as those created by poverty, racial discrimination, inadequate housing, and family disintegration may contribute to lack of food and to malnutrition.

- **Psychological Factors**
  
  An example of the many psychological problems that may contribute to malnutrition is maternal deprivation, which may lead to actual or fall rejection of a child and inadequate feeling.

- **Economic and political structure**
  
  The economic and political system of a region controls the power structure; governs administrative policy, and controls channels of food supply and form.

- **Agriculture**
  
  GeoCharty, climate, food technology, and method of agriculture influence food supply. What food can and will be produced is determined by the natural resources and their degree of development.
Nutrition is the study of the use of foods by the body for the processes of growth, repair, and work.

Food provides the body with materials which are seeded for the following:

1. For the production of heat.
2. For the regulation of body processes.
3. For growth, repair, and reproduction.
4. In the reaction of the body against disease.
5. To provide the minerals required by the body for cells, body fluids, and bones.
6. To keep a proper water balance.

Everywhere in the world the foods eaten by various communities differ a great deal, but all these different foods are actually made up of the same.

4.10 Deficiency diseases due to inadequate intakes of vitamins occur in many areas

In many countries and often in specific areas within a country: severe manifestations of vitamin malnutrition are found in the third world food survey conducted by F.A.O.

Vitamin A deficiency was reported to be a public health problem in Indonesia, mainland China, Burma, and other ports of the Far East, in parts of Latin America, and in the semiarid zones of Africa.

The disease is common and is major cause of death among infants two to five months old in Burma, Thailand, Vietnam, The South mainland of China, East-Pakistan.

And in some parts of India in recent years the incidence of beriberi has been reduced in areas where government regulations
require only partial milling or enrichment of rice or where the practice of not washing parboiled rice before cooking is common on the other hand the occurrence of thiamin deficiency disease has increased in some parts of the world because of the introduction of machine milling which has led to availability and consumption of highly polished rice.

1. Work simplification and calorie intake may be problems:
   Work simplification and calorie intake may be problems for the crippled person. The individual who has rheumatic fever, arthritis, epilepsy cleft palate impaired vision or a heart condition also may have nutrition problems.

2. The stress of fight into space poses nutritional problems:
   However, little is understood about the physiological response to nutrient intake during periods of weightlessness. It is thought that reduction of gravitational force may result in metabolic responses similar to those observed in patients at bed rest. These include excessive losses of calcium, phosphorus, sodium and potassium and possibly of other electrolytes.

3. Endemic goiter and nutritional anemia are problems in some areas. According to the reports of studies by F.A.O. WHO and INCAP, endemic goiter is a significant problem in many parts of the world the disease is more common in female's ages 12 to 18 years and in male's ages 9 to 13 years than in adults.

   Nutritional anemia is widespread in those parts of the world where diets are marginal in protein, iron, folic acid and less frequently in vitamin B_{12} Darby and associates in investigation carried out in the Jordanian sector of Jerusalem in Egypt, reported an association between vitamin E nutriture and the occurrence of macrocytic anemia in malnourished infants.
Nutritional anemia is of species concern during periods of growth and reproduction and may result either in high maternal and infant mortality or in a chronic condition with many insidious side effects. Anemia commonly found in tropical areas of often associated with malaria and with parasitic infections and with zinc deficiency.

❖ **Substances or Nutrients:**

1. Proteins or body-building material.
2. Fats and starches used especially for energy.
4. Vitamins that are used in many processes in the body and are necessary in small quantities for health.
5. Water.
6. Roughage.

### 4.11 Nutrients and Common Foods

**Protein**

Protein is necessary for the growth and repair of all body cells. There are two kinds:

1. Animal protein which comes from meat, fish, cheese, eggs, and milk, including, of course, human milk.
2. Vegetable protein which comes from peas, beans, nuts, lentils, gram, some constituents of cereals (for example millet, maize, rice, oatmeal and sorghum), and dark green leaves.

### 4.12 The importance of measuring growth

The growth of a child is related to the nutrition of the child and so measurements of growth are one of the indications of nutritional status. Growth and development are shown by increases in weight and
in height. If nutrition is good these process at a normal rate which is much the same for children all over the world. A shortage of food or an illness is reflected very quickly by a failure to gain weight or by weight loss. Growth in height is set back less quickly but if there is a chronic shortage of food or chronic illness (or repeated series of illnesses) then height will also be retarded and the child will be short for his age. The different patterns of malnutrition can be shown in a diagram. Nutrition surveys look at height and weight in relation to age and of weight for height and weight in relation to age in order to get a picture of the nutrition of children in a community.

4.13 Food Requirements

The body is composed of a large number of cells which have a very active chemical life. To provide them with the material for all this, the food coming into the body has to be broken down and used up in many ways. All this activity requires oxygen and energy from food or fuel. The fuel, however, is not all the same; some fuels produce more heat than others—for example, fats will burn up more rapidly and produce more heat. Fats produce more heat. Fats produce more heat for the same weight of food than any other food substance, and add to the food value of the diet quicker than other foods.

- The needs for energy from food are affected by:
  1. The kind of work person does.
  2. The age of the person, and his activity and state of growth.
  3. Climate—more food is needed in a very cold climate.
  4. Size—the need for food is in proportion to the body surface.
  5. Pregnancy—food here is required for the growth of the fetus.
4.14 The following suggestions minimize nutrient loss during storage

1) Avoid bruising soft fresh produce such as berries and peaches.
2) Store perishable items at the recommended temperature, usually in the refrigerator or freezer.
3) Store perishable items at the recommended temperature usually in the refrigerator or freezer.
4) Store foods, except fresh meals in containers that allow little in containers that allow little room for air or wrap them in moisture vapor-proof material.
5) Package green vegetables in such a way that they stay crisp. Keep them slightly moist not weef. (washed letture keep wet if wrapped loosely in a clean and enclosed in a plastic bag.
6) Store less perishable items (such as canned foods dry cereals, cooking oils) in a cool dry place.
7) If foods are not stored in opaque or colored glass containers. Store away from the light.
8) Plan for fast turnover of food on the shelf as in the refrigerator to avoid long storage times. Use leftovers as soon as possible.

Measures to conserve the nutritive value of food during preparation include the following:-

1) Prepare fresh produce as close to time of use as is practical.
2) Use a very sharp knife for cutting fresh produce.
3) Avoid seeking cutup fruits and vegetables, especially if they are the major source of any water soluble nutrients.
4) When appropriate, scrub vegetables instead of poring them and lease them whole instead of cutting them up.

5) If poring is desired pore as thinly as possible. If practical (as for beef) and potatoes peel after cooking.

6) Use clean fresh vegetable parings for making stock for soup.

7) Use the liquid from canned fruits as an ingredient in homemade fruits punch.

8) Save time, fuel and nutrients by eating raw fruits and vegetable often.

9) Avoid reheating leftover cooked vegetable by using them in salads.

In order to maximize nutrient retention during cooking, use the following measures.

1) Cooked for the shortest time possible, just until tender.

2) If cooking any type of vegetable in water make sure it is poling rapidly before vegetable is added.

3) Cook vegetables in the smallest amount of water practical for the type of plan, but take care not to scorch them. A small volume of water is especially helpful to reduce nutrient loss when cooking vegetables that are cut in small pieces. Cover the pan tightly to minimize the amount of water needed.

4) Steam or pressure cook clean whole, unpeeled vegetables.

5) Plan the meal so that vegetables can be served as soon as they are cooked.

6) Hear canned vegetables in the liquid in which they are packed.
7) Use cooking vegetables and drippings from sauces, soup, and stock or for cooking grains such as rice small amounts of cooking liquid can be saved and stored in the freezer.

8) Do not add baking soda when cooking vegetable. Stay brightly coloured.

9) Avoid brewing grains (such as granoba or rice) to a dark colour if the food makes up a large fraction of the diet.

A numbers of steps can be taken to minimize opportunities for bacteria to multiply to dangerous levels:-

1) Buy perishable foods lasts at the supermarket. Get them home and into the refrigerator promptly.

2) Make sure your refrigerator maintains a temperature of less than 7°C. (45°F.). Many refrigerators checked in recent study did not.

3) Avoid allowing perishable foods to stand at room temperature [or at any temperature within the danger zoon] during food preparation.

4) Do not allow food that will support growth to pathogenic bacteria to remain in the range at 15°C to 60°C. (60°F to 14°F) for more than two hours.

5) Quickly chill foods that require refrigeration. Refrigerate a roast or other perishable cooked while it is still hot. Just be sure that the hot food is not in contact with a cold food in the refrigerator. If practical, spread container of food in to a larger containers of water before refrigerating it. (This saves fuel.)

6) If you insist on stuffing poultry stuff immediately before roasting remove the stuffing before refrigerating leftovers.
7) When taking food on a picnic or when packing a lunch, use insulated containers to keep hot foods hot and cold foods cold. Preheat or precook them for extra safety. Use ice to be sure that salads, and other highly perishable food, stay cold.

4.15 Conclusion

The health status and the level of personal hygiene of the food handlers in the eating establishments were found to be unsatisfactory. The cooks and suppliers who handled food were not maintaining a satisfactory personal hygiene, thereby increasing the risk of food contamination considerably. Food hygiene can be best promoted by educating the food handlers; to inculcate the practices of good personal hygiene.

Although most of the workers in the organized sectors are covered under the Employee’s state Insurance scheme and are entitled to medical and other benefits, it is not the case with the unorganized sectors, and small food establishments. Daily inspections of the workers with regard to their health and hygiene, Periodic medical examination along with necessary treatment such as de-worming should be done. Training in hygiene and sanitation for all employees working in food establishments is an essential step towards ensuring food safety.