BHARATH COLLEGE OF SCIENCE AND MANAGEMENT, THANJAVUR – 05.

DEPARTMENT OF HOTEL MANAGEMENT

NUTRITION AND FOOD SCIENCE
SUBJECT CODE – 16SCCHM4

Prepared by,
Mrs. R. Soukarthika,
Asst. prof,
Dept. of HM&CS,
BCSM,
Thanjavur – 05.

UNIT – I:

Nutrition:

- **Nutrition** is the science that interprets the interaction of nutrients and other substances in food in relation to maintenance, growth, reproduction, health and disease of an organism. It includes food intake, absorption, assimilation, biosynthesis, catabolism and excretion.
- The diet of an organism is what it eats, which is largely determined by the availability and palatability of foods. For humans, a healthy diet includes preparation of food and storage methods that preserve nutrients from oxidation, heat or leaching, and that reduce risk of food borne illness.
- In humans, an unhealthy diet can cause deficiency-related diseases such as blindness, anemia, scurvy, preterm birth, stillbirth and cretinism, or nutrient excess health-threatening conditions such as obesity and metabolic syndrome; and such common chronic systemic diseases as cardiovascular disease, diabetes, and osteoporosis.

Health:

- **Health** is the level of functional and metabolic efficiency of a living organism. In humans it is the ability of individuals or communities to adapt and self-manage when facing physical, mental, psychological and social changes with environment.
- The World Health Organization (WHO) defined health in its broader sense in its 1948 constitution as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."

The Relationship between Nutrition and Health:

Food is a basic and foundational part of our lives. But sometimes we act as if the link between a balanced diet and our health does not exist – rather, we should look at it as a strong one.

Study after study has shown that people who eat whole foods rich in nutrients enjoy their lives more, live longer, and are at a reduced risk of disease. By eating the right foods, reducing our intake of fat and sugar, and exercising portion control, we can also maintain a healthy body weight and avoid chronic diseases such as diabetes and heart disease.

Defining the Strong Relationship between Nutrition and Health:

Here are some of the better-researched relationships between what we eat and our health:

VITAMIN C:

Vitamin C is an important immune system booster, and may also help increase "good" HDL cholesterol levels and strengthen bones. Citrus fruits, such as oranges, lemons, and grapefruit, are high in Vitamin C, as are strawberries, avocados, and peppers.

POTASSIUM:

Potassium is important for proper nerve function, and potassium-rich foods can also lower your risk of high blood pressure, stroke, and heart disease. Bananas are famously high in potassium, but so are avocados, sweet potatoes, and some tomato varieties.

ANTI-OXIDANTS:

Anti-oxidants have been all the rage in health circles for some time, and for a good reason: They remove potentially damaging oxidizing agents in a living organism, cutting down on the free radicals that can harm healthy tissues. A range of fruits and vegetables, from apples and blueberries to carrots and peppers, contain anti-oxidants, as do nuts such as almonds and peanuts. (Here's a tip: Add citrus, mentioned above, to some green tea. One study found that citrus increases your body's ability to absorb the antioxidants in the tea by about 80 percent!) One kind of anti-oxidant you'll enjoy eating are flavonoids, which have been shown to reduce "bad" LDL cholesterol and increase "good" HDL levels. These are not only found throughout plants but also in cocoa powder, the main ingredient in dark chocolate.

FATTY ACIDS:

One nutrient the American diet is often lacking is Omega-3 fatty acids, found primarily in flaxseed oil, salmon, chia seeds, walnuts, soybeans, and spinach. Too bad we don't eat more of it, as studies have linked it with a reduced risk of depression, heart disease, and cancer.

GOOD NUTRITION CAN HELP:

- Reduce the risk of some diseases, including heart disease, diabetes, stroke, some cancers, and osteoporosis.
- Reduce high blood pressure.
- Lower high cholesterol.
- Improve your well-being.
- Improve your ability to fight off illness.
- Improve your ability to recover from illness or injury.

BALANCED DIET:

- A **diet** that contains the **proper** proportions of carbohydrates, fats, proteins, vitamins, minerals, and water necessary to maintain good health.
- A balanced diet is one which contains different types of foods in such quantities that the individual's need for the various nutrients is adequately met, and some amounts of nutrients are stored in the body to withstand short periods of low dietary intake.

CHARACTERISTICS OF A BALANCED DIET:

- A balanced diet contains both plant and animal foods and fulfills following requirements:
- It meets the nutritional requirements of an individual
- They includes foods from all the food groups
- It contains a variety of foods
- It consists of seasonal foods
- It is economical
- It suits the taste and meets the desires of the individual eating it

ROLE OF BALANCED DIET:

A balanced diet is important because your organs and tissues need proper nutrition to work effectively. Without good nutrition, your body is more prone to disease, infection, fatigue, and poor performance.

WHAT IS A BALANCED DIET?

A balanced diet is one that gives your body the nutrients it needs to function correctly. To get the proper nutrition from your diet, you should consume the majority of your daily calories in:

- fresh fruits
- fresh vegetables
- whole grains
- legumes
- nuts
- lean proteins

WHY A BALANCED DIET IS IMPORTANT:

A balanced diet is important because your organs and tissues need proper nutrition to work effectively. Without good nutrition, your body is more prone to disease, infection, fatigue, and poor performance. Children with a poor diet run the risk of growth and developmental problems and poor academic performance, and bad eating habits can persist for the rest of their lives. Learn more about healthy meal plans for kids.

Rising levels of obesity and diabetes in America are prime examples of the effects of a poor diet and a lack of exercise. The Center for Science in the Public Interest reports that 4 of the top 10 leading causes of death in the United States are directly influenced by diet. These are:

- heart disease
- cancer
- stroke
- diabetes

HOW TO ACHIEVE A BALANCED DIET:

At the core of a balanced diet are foods that are low in unnecessary fats and sugars and high in vitamins, minerals, and other nutrients. The following food groups are essential parts of a balanced diet.

FRUITS:

Besides being a great source of nutrition, fruits make tasty snacks. Choose fruits that are in season in your area. They're fresher and provide the most nutrients.

Fruits are high in sugar. This sugar is natural, though, so fruit can still be a better choice for you than other foods with added sugar. If you're watching your sugar intake or have a condition such as diabetes, you may want to opt for low-sugar fruits. Read on to learn about the 11 best low-sugar

fruits, from citrus to peaches. People who are watching their carbohydrate intake may reach for fruits such as melons and avocadoes.

VEGETABLES:

Vegetables are primary sources of essential vitamins and minerals. Dark, leafy greens generally contain the most nutrition and can be eaten at every meal. Eating a variety of vegetables will help you obtain the bountiful nutrients that all vegetables provide.
Examples of dark leafy greens include:

- spinach
- kale
- green beans
- broccoli
- collard greens
- Swiss chard

GRAINS:

According to the USDA, Americans consume refined white flour more than any other grain. Refined white flour has poor nutritional value because the hull of the grain, or outer shell, is removed during the refining process. The hull is where the majority of the grain's nutrition lies.
Whole grains, however, are prepared using the entire grain, including the hull. They provide much more nutrition. Try switching from white breads and pastas to whole-grain products.

PROTEINS:

Meats and beans are primary sources of protein, a nutrient that is essential for proper muscle and brain development. Lean, low-fat meats such as chicken, fish, and certain cuts of pork and beef are the best options. Removing the skin and trimming off any visible fat are easy ways to reduce the amount of fat and cholesterol in meats. The health and diet of the animal are important and influence the fatty acid profile of the meat, so grass-fed choices are ideal.

Nuts and beans are good sources of protein and contain many other health benefits, as well as fiber and other nutrients. Try to eat:

- lentils
- beans
- peas
- almonds
- sunflower seeds
- walnuts

Tofu, tempeh, and other soy-based products are excellent sources of protein and are healthy alternatives to meat.

DAIRY:

Dairy products provide calcium, vitamin D, and other essential nutrients. However, they're also major sources of fat, so it may be best to choose small portions of full-fat cheeses, and reduced-fat or fat-free milk and yogurt. Plant-based milks, such as those made from flaxseed, almonds, or soy are typically fortified with calcium and other nutrients, making them excellent alternatives to dairy from cows.

OILS:

Oils should be used sparingly. Opt for low-fat and low-sugar versions of products that contain oil, such as salad dressing and mayonnaise. Good oils, such as olive oil, can replace fattier vegetable oil in your diet. Avoid deep-fried foods because they contain many empty calories.

The USDA has an online checklist that can help you determine how much of each food group you should consume daily.

Besides adding certain foods to your diet, you should also reduce your consumption of certain substances to maintain a balanced diet and healthy weight. These include:

- alcohol
- refined grains
- solid fats
- saturated fats
- trans fats
- salt
- sugars

FIVE BASIC FOOD GROUPS:

MORE INFORMATION ON THE FIVE FOOD GROUPS:

- Vegetables and legumes/beans.
- Fruit.
- Grain (cereal) foods, mostly wholegrain and/or high cereal fibre varieties.
- Lean meats and poultry, fish, eggs, tofu, nuts and seeds and legumes/beans.
- Milk, yoghurt cheese and/or alternatives, mostly reduced fat.

FIVE MAIN FOOD GROUPS:

A BALANCED DIET IS MADE UP OF THE FIVE FOOD GROUPS:

- Carbohydrate. This group contains starchy foods such as pasta, rice, oats, potatoes, noodles, yam, green bananas, sweet potato, millet, couscous, breads, breakfast's cereals, barley and rye.
- Proteins. ...
- Milk and dairy products. ...
- Fruit and vegetables. ...
- Fats and sugars.

MACRONUTRIENTS:

The macronutrients are carbohydrates, fiber, fats, protein, and water. The macronutrients (excluding fiber and water) provide structural material (amino acids from which proteins are built, and lipids from which cell membranes and some signaling molecules are built) and energy. Some of the structural material can be used to generate energy internally, and in either case it is measured in Joules or kilocalories (often called "Calories" and written with a capital *C* to distinguish them from little 'c' calories). Carbohydrates and proteins provide 17 kJ approximately (4 kcal) of energy per gram, while fats provide 37 kJ (9 kcal) per gram, though the net energy from either depends on such factors as absorption and digestive effort, which vary substantially from instance to instance. Vitamins, minerals, fiber, and water do not provide energy, but are required for other reasons.

Molecules of carbohydrates and fats consist of carbon, hydrogen, and oxygen atoms. Carbohydrates range from simple monosaccharide (glucose, fructose and galactose) to complex polysaccharides (starch). Fats are triglycerides, made of assorted fatty acid monomers bound to a glycerol backbone. Some fatty acids, but not all, are essential in the diet: they cannot be synthesized in the body. Protein molecules contain nitrogen atoms in addition to carbon, oxygen,

and hydrogen. The fundamental components of protein are nitrogen-containing amino acids, some of which are essential in the sense that humans cannot make them internally. Some of

the amino acids are convertible (with the expenditure of energy) to glucose and can be used for energy production, just as ordinary glucose, in a process known as gluconeogenesis. By breaking down existing protein, the carbon skeleton of the various amino acids can be metabolized to intermediates in cellular respiration; the remaining ammonia is discarded primarily as urea in urine.

MICRONUTRIENTS:

The micronutrients are minerals, vitamins, and others. **Relationship between Food, Nutrition & Health Definitions:**

- Food – is one that nourishes the body.
- Food may also be defined as any substance eaten or drunk which meets the needs for energy, body building, regulation and protection of the body.
- Food is the material from which our bodies are made.
- Eating right kind of food in right amounts ensures good nutrition and health.

Nutrition:

- It is food at work in the body. It includes everything that happens from eating food to its usage in various functions of body.
- Nutrients are components of foods needed for body in adequate amounts for proper growth, reproduction and leading normal life.
- The science of nutrition deals with what nutrients we need, in what quantity, how to get them and how the body utilizes them.
- Adequate, optimum and good nutrition – indicates the right amount and proportion of nutrients for proper utilization for achieving highest level of physical and mental health.
- Nutritional status – state of the body as a result of foods consumed and their utilization by the body. Nutritional status can be good, fair and poor.

GOOD NUTRITIONAL STATUS:

It is characterized by an alert, good natured personality, a well developed body with normal weight for height, well developed and firm muscles, healthy skin, reddish pink colored eyelids and membranes of mouth, good layer of subcutaneous fat, clear eyes, smooth and glossy hair, good appetite and excellent general health which is recognized by stamina to work, regular meal time, sound sleep, normal elimination and resistance to disease.

Health:

It is defined by WHO is the 'state of complete physical, mental and social well being and not mere absence of disease or infirmity'.

MALNUTRITION:

It is undesirable kind of nutrition leading to ill health. It results from lack, excess or imbalance of nutrients in the diet. It includes both under and over nutrition. Under nutrition is a state of insufficient supply of essential nutrients.

Malnutrition can be primarily due to insufficient supply of one or more essential nutrients or it can be secondary, which means it results from an error in metabolism, interaction between nutrients or nutrients and drugs used for treatment.

FUNCTIONS OF FOOD:

They are three types namely, Physiological Function, Social Function and Psychological Function.

Physiological functions of food:

- First function of food is to provide energy. Body needs energy to sustain involuntary processes essential for continuing life. It is also required for various activities like professional, household and recreational activities, convert foods into utilizable nutrients required for growth and warmth.
- Another important function is body building. An infant at birth weighs 2.5-3.0 kgs and grows to 50-60 kgs during adulthood, which is possible only if right food in right amount is given from birth to adulthood. Food eaten also helps to maintain the structure of the body and helps in repair of worn out tissues.
- Food regulates the activities of the body including – heart beat, maintaining body temperature, muscle contraction, water balance, blood clotting and removal of waste products from the body.
- Food helps in improving the immune system and improves resistance power of the body.

SOCIAL FUNCTIONS OF FOOD:

- Food has always been the central part of our existence, social cultural and religious life
- Special foods are distributed during religious functions in homes, temples, churches etc.
- Feasts are given in different stages of life like birth, cradle ceremony, birthdays, marriages etc. many feasts call for feeding specific segment of people.

- Certain menus are associated with specific foods in each region.
- Food has been used as expression of love friendship and social acceptance

- ❖ Food is also used to express happiness like success in exams, job, marriages, birth of a baby etc.
- ❖ Food forgets together, meetings or functions should be planned in a proper manner to bring people together.

PSYCHOLOGICAL FUNCTIONS OF FOOD:

- ❖ In addition to physical and social needs, food must satisfy certain emotional needs.
- ❖ It includes a sense of security, love and attention.
- ❖ Familiar foods usually make us feel secure.
- ❖ Sharing of food is a token of friendship and acceptance.
- ❖ In a friendly gathering we try unfamiliar foods and thus enlarge our food experiences.
- ❖ Anticipating needs and fulfilling these are expressions of love and attention.
- ❖ These sentiments are the basis of the normal attachment to mother's cooking or home food.
- ❖ If the foods included are unfamiliar or not tasty, then even nutritionally balanced foods may not be satisfactory.
- ❖ With time and repeated experience unfamiliar and strange foods become familiar and one develops taste for those foods.
- ❖ Therefore these aspects are to be kept in mind while planning meals which are nutritionally adequate and also enjoyable.

MEAL PLANNING:

Meal planning is making a plan of meals with adequate nutrition for every member of the family within the available resources. The term 'available resources' means whatever the family has in terms of time, energy and money.

IMPORTANCE OF MEAL PLANNING:

Meal planning is important for meeting the nutritional requirements of the family members. It helps us to decide what to eat each day and in each meal. We can call it our 'daily food guide'. **Meal planning helps us to:**

(a) Fulfill the nutritional requirements of the family members

(b) It makes the food economical

(c) Cater to the food preferences of individual members

(d) Save energy, time and money

(e) Use leftover food

FACTORS AFFECTING MEAL PLANNING:

What guidelines do you keep in mind while planning meals? What all do you consider to make your meal planning effective? Yes, there are many factors such as

1. **Nutritional Adequacy:**

   This is the most important factor, which means that the nutritional requirements of all the family members are fulfilled. For example, you know a growing child needs more protein, a pregnant or lactating woman needs calcium, etc. While planning meals you will include food items from various food groups, that is, energy giving foods, body building foods and protective and regulating foods.

2. **Age:**

   People normally eat according to their age. You must have observed in your family that the diet of various members of different age groups differs in quantity. A new born baby drinks only milk, a small child's meal is also of very small quantity, an adolescent eats still more in amount and variety of foods. Similarly, you must have seen your grandfather eating less food and also that they prefer soft and easy to digest foods.

3. **Sex:**

   Sex is another factor which determines the dietary intake. Dietary requirement of adolescent and adult males are more than their female counterparts.

4. **Physical Activity:**

   The kind of work a person does affect the kind and amount of food they need to take. Do you remember that RDA is different for people eng aged in different activities? A labourer not only eats more quantity but needs more energy because he is engaged in hard work. His body uses up more energy while performing hard work. So, if you have to plan for such a person you will include more energy giving foods in the diet.

5. **Economic Considerations:**

   Money available to the family to be spent on food is another major factor. Foods like milk, cheese, meat, fruits, nuts etc. are expensive. However, alternative sources like toned milk, seasonal fruits and vegetables are less costly and at the same time

nutritious. You can therefore plan a balanced diet to suit every budget.

BASIC PRINCIPLES OF MEAL PLANNING:

Preparation is a management principle whereby people get ready for a final product or for a successful experience. Preparation means "a substance especially prepared".Preparation is a proceeding or readiness for a future event as a goal and an acceptable accomplished final outcome. It is to make something (*e.g.*, child, food, procedures, and machines) acceptable before you give it to others.

THE 6 BASIC PRINCIPLES OF DIET PLANNING:

A good diet promotes positive change and helps you incorporate sensible eating into your daily lifestyle. When designing a practical eating regimen, diet planners often recommend the ABCDMV method -- the six basic principles of adequacy, balance, calorie control, density, moderation and variety.

1. ADEQUACY:

An adequate diet provides the human body with energy and nutrients for optimal growth, maintenance and repair of tissue, cells and organs. Water, carbohydrates, fats, proteins, vitamins and some minerals comprise the six nutrient classes relied upon for performance of essential functions and activities. These nutrients must be replaced through diet to keep the body working efficiently. An adequate diet includes foods containing proper amounts of these nutrients to prevent deficiencies, anemia, headaches, fatigue and general weakness.

2. BALANCE:

A balanced diet includes foods containing sufficient amounts of each class of nutrients. For example, while milk is a good source of calcium and fish provides necessary iron and protein, the two are not enough alone. Other essential vitamins, carbohydrates and fats are found in whole grains, vegetables and fruits. The U.S. Department of Agriculture provides a great blueprint for a balanced diet with its five food groups -- grains, proteins, vegetables, fruit and dairy. Consuming the proper amount of servings from each category ensures a well-proportioned diet.

3. CALORIE CONTROL:

Once you know what to eat, the next factor is how much. It is possible to eat healthy foods and still overindulge. Therefore, a reasonable calorie allowance must be established. The amount of energy the body receives from incoming food needs to match the amount of energy needed for the body to

sustain its biological and physiological activities. In other words, input needs to match output. An imbalance leads to weight loss or gain.

4. (NUTRITIONAL) DENSITY:

Eating well without overeating is often challenging. You must select foods that pack the most nutrients into the least amount of calories. For example, 1 ounce of cheese and 1 cup of fat-free milk contain the same amount of calcium. While both foods are adequate sources of calcium, the milk is more calcium-dense than the cheese because you get the same amount of calcium with one- half the calories and no fat. In another example, calorie allowance is not a useful tool by number alone. Although a bowl of grapes and a can of soda contain roughly the same number of calories, the grapes contain far more nutrients than the cola. Designing a nutritionally sound diet requires proper "budgeting" of calories and nutrients so that you eat less while supporting good health.

5. MODERATION:

Socrates once said "Everything in moderation; nothing in excess." Though over 2,500 years old, this adage still holds true. Those who place severe restrictions on what they can or cannot eat often find it difficult to stick to a pattern of sensible eating. Depriving yourself of foods rich in fat and sugar is not necessary. When eaten on occasion, these treats are not detrimental to your health and often provide enough enjoyment to keep one motivated to continue healthy eating practices.

6. VARIETY:

It's possible for a diet to have all the aforementioned characteristics, but still lack variety. While some people are creatures of habit and don't mind eating the same meals every day, most of us crave a wide array of choices and tastes. Good nutrition does not have to be boring. The USDA's food groups allow you to receive the proper nutrients while having a great selection of foods to pick and choose from. After all, variety is the spice of life.

ICMR:

The Indian Council of Medical Research (**ICMR**), the apex body in India for the

formulation, coordination and promotion of biomedical research, is one of the oldest and largest medical research bodies in the world.

- **Recommended Dietary Allowances** (RDA), the daily dietary intake level of a nutrient considered sufficient by the Food and Nutrition Board of the Institute of Medicine to meet the requirements of 97.5% of healthy individuals in each life-stage and sex group. The definition implies that the intake level would cause a harmful nutrient deficiency in just 2.5%. It is calculated based on the EAR and is usually approximately 20% higher than the EAR
  (See Calculating the RDA).
- Recommended Dietary Allowances (RDAs) are the levels of intake of essential nutrients that, on the basis of scientific knowledge, are judged by the Food and Nutrition Board to be adequate to meet the known nutrient needs of practically all healthy persons.
- **RDAs** apply to vitamins and minerals from food and daily supplements. The purpose of these guidelines is to inform you how much of a specific nutrient your body needs on a daily basis. It is **important** to meet your daily recommended dietary allowances so that your body gets everything it needs to function.

DIETARY ALLOWANCES RECOMMENDED BY INDIAN COUNCIL OF MEDICAL RESEARCH (ICMR)

FOR INDIAN POPULATION

Recommended Dietary Allowances (RDA) are estimates of intakes of nutrients which individuals in a population group need to consume to ensure that the physiological needs of all subjects in that population are met.

Following the recommendations of the League of Nations in 1937, an attempt to recommend dietary allowances for energy, protein, iron, calcium, vitamin A, thiamine, ascorbic acid and vitamin D for Indians was made in 1944 by the Nutrition Advisory Committee of the Indian Research Fund Association, now called Indian Council of Medical Research (ICMR).

Between 1950 and 1968, in the wake of recommendations for energy and protein requirements by the Food and Agricultural Organization (FAO) and based on the international data provided by the FAO/WHO expert groups and those available in India,

the recommendations for dietary requirements were revised.

Few years later, newer set of data generated by various researches and surveys conducted by renowned institutions like Avinashilingam Institute for Home science and Higher Education for Women - Deemed University, Coimbatore, National Institute of Nutrition, Hyderabad, ICMR and National Nutrition Monitoring Bureau (NNMB), created a necessity to revise RDAs further.

In 1988 an expert committee constituted by ICMR modified the reference body weight for Indian adults and RDAs in respect of energy, fat, vitamin D and vitamin A. Recommendations on safe intake of fat in terms of both visible and invisible dietary fats were made. For the first time, recommendations for certain trace elements, electrolytes (sodium and potassium), magnesium and phosphorus, vitamin K and vitamin E and dietary fibre were considered.

A number of approaches such as dietary intake of nutrients growth nutrient balance minimal loss of nutrients and nutrient turnover were utilized in arriving at the RDAs.

The RDA of an individual depends upon various factors which are as follows:

Age: Adults require more total calories than a child, whereas a growing child requires more calories per kg of body weight than an adult.

Sex: Males with high Basal Metabolic Rate (BMR) require more calories than females.

Activity: The type of activity also determines the energy requirements. The activities are classified as sedentary, moderate and heavy based on the occupation of an individual. List below gives the ICMR classification of activities based on occupation.

1. Sex : Male
2. Sedentary : Teacher, Tailor, Barber, Executive, Peon, Postman, retired personnel, priest
3. Moderate : Fisher man, Basket, maker, potter, Goldsmith, Agricultural labourer,carpenter, mason, rickshaw puller electrician, fitter, turner, cooli, weaver, driver
4. Heavy : Stone Cutter, Mine Worker, Wood cutter, Blacksmith
5. Sex : Female
6. Sedentary : Teacher, Tailor, Executive
7. Moderate : House wife, Nurse, Servant maid, cooli, Basket maker, weaver, Agricultural labourer, Beedimaker
8. Heavy : Wood Cutter

WHAT IS THE PURPOSE OF RDA?

Recommended dietary allowances, or RDAs for short, are guidelines put together by the Food and Nutrition Board of the National Academy of Sciences' Institute of Medicine.

RDAs apply to vitamins and minerals from food and daily supplements. The purpose of these guidelines is to inform you how much of a specific nutrient your body needs on a daily basis. It is important to

meet your daily recommended dietary allowances so that your body gets everything it needs to function.

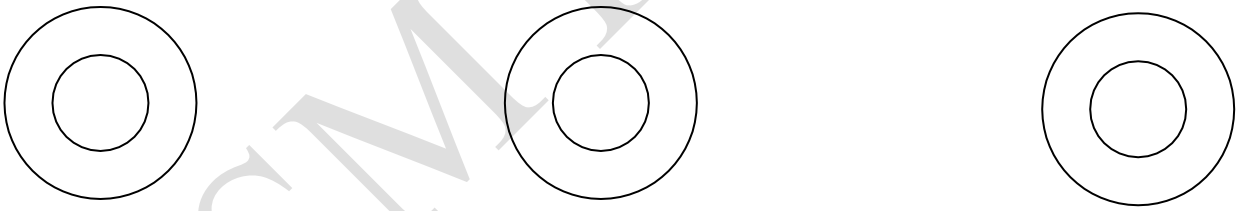
USES:

Recommended dietary allowances are on nutrition facts labels on all of the foods you eat. Food manufacturers are required to list the percent daily value of RDAs for certain nutrients, including vitamin A, vitamin C, calcium and iron. Some manufacturers may list other nutrients if they desire and enrich their products to boost nutritional value. Additionally, schools, prisons, hospitals and other institutions use recommended dietary allowances to create nutritious recipes and healthful meals.

PHYSIOLOGICAL STRESS:

Nutrient requirements are increased in conditions of physiological stress such as pregnancy and lactation.

The RDAs are given for various age groups such as adult man and adult woman (for various activities), pregnant and lactating women, infants, children (1-9 years), boys and girls (10-12 yrs) and adolescents.



UNIT – II

ASSESSMENT OF NUTRITIONAL STATUS:

Authropometic, Clinical, Biochemical and Dietary methods.

NUTRITIONAL STATUS:

- ✓ The condition of health of a person that is influenced by the intake and utilization of nutrients is called nutritional status.
- ✓ It is the current body status, of a person or a population group, related to their state of nourishment (the consumption and utilization of nutrients).

ASSESSMENT OF NUTRITIONAL STATUS:

- ✓ The process of determine the nutritional status of an individual or a group is known as nutritional assessment.
- ✓ Nutrition is assessed by two methods; direct and indirect.
- ✓ The direct methods deal with the individual and measure objective criteria, while indirect methods use community nutritional status/needs.
  - We need a nutritious diet for our well-being and good health.
  - When our body receives all the nutrients in appropriate amounts so as to meet the needs of the body, and then we are in the state of good nutrition.
  - We have a normal nutritional status.
  - However, when the nutrients provided in the diet are inadequate or not utilized properly, it results in a state of imbalance in the body. If this continues for sometime it may develop into a severe problem which may even prove fatal.

Normal nutritional status	**Balanced food intake**
	Normal utilisation of nutrients

When there is a lack of excess intake of one or more nutrients and/or faulty utilization of nutrients in our body, it leads to the state of imbalance in the body. This condition is known as malnutrition.

Malnutrition	**Imbalanced food intake**

	Faulty utilisation of nutrients

There are two types of malnutrition. The condition of health of a person that results due to the lack of one or more nutrients is called ***under nutrition***. However, when there is an excess intake of nutrients, it results in ***over nutrition***.

Malnutrition	
Undernutrition	**Overnutrition**

Thus the condition of malnutrition covers both the states of under nutrition and over nutrition. You must have seen people who eat energy rich foods in amounts more than what is required by their bodies become fat /obese. This is the result of over nutrition. This state of being obese is harmful as it may lead to serious health problems. But under nutrition is more common around us. In fact malnutrition has become a synonym of 'under nutrition'.

DIRECT METHODS OF NUTRITIONAL ASSESSMENT:

These are summarized as ABCD

- ✓ **A**nthropometric methods
- ✓ **B**iochemical methods
- ✓ **C**linical methods
- ✓ **D**ietary evaluation methods

1. ANTHROPOMETRIC METHODS:

- ❖ Anthropometry is the measurement of **body height, weight and proportions.**
- ❖ It is an essential component of clinical examination of infants, children and pregnant women.
- ❖ These measurements are compared to the reference data (standards) of the same age and sex group, in order to evaluate the nutritional status.
- ❖ It is used to evaluate both under and over nutrition.
- ❖ The measured values reflects the current nutritional status and don't differentiate between acute and chronic changes.

OTHER ANTHROPOMETRIC MEASUREMENTS:

- Mid-arm circumference
- Skin fold thickness

- Head circumference
- Head / chest ratio
- Hip / waist ratio

ANTHROPOMETRY FOR CHILDREN:

- Accurate measurement of height and weight is essential. The results can then be used to evaluate the physical growth of the child.
- For growth monitoring the data are plotted on growth charts over a period of time that is enough to calculate growth velocity, which can then be compared to international standards.

MEASUREMENTS FOR ADULTS:

HEIGHT:

- The subject stands erect and bare footed on a stadiometer with a movable head piece.
- The head piece is leveled with skull vault and height is recorded to the nearest 0.5 cm.

WEIGHT MEASUREMENT:

- Use a regularly calibrated electronic or balanced-beam scale. Spring scales are less reliable.
- Weight in light clothes, no shoes
- Read to the nearest 100 gm (0.1 kg)

USES:

- They are used in many fields. For example, athletes understand that body size, shape and composition of the human body.
- This method are used together these measurements, such as BMI, waist-to-hip ratio, skin-fold test and bioelectrical impedance.
- They are used to body mass index, or BMI, is a measurement of a person's weight-to-height ratio.

2. BIOCHEMICAL METHODS:

- The study of the chemical substances and vital processes occurring in living organisms; biological chemistry; physiological chemistry.

- The chemical composition of a particular living system or biological substance: viral biochemistry.
- Biochemical process involving the use of micro-organism, enzymes, vectors, or antibodies.

ADVANTAGES:

- It is useful in detecting early changes in body metabolism and nutrition before the appearance of overt clinical signs.
- It is precise, accurate and reproducible.
- Useful to validate data obtained from dietary methods eg. Comparing salt intake with 24-hour urinary excretion.

LIMITATION:

- Time consuming
- Expensive
- They cannot be applied on large scale.

3. CLINICAL METHODS:

- Clinical assessment is a way of diagnosing and planning treatment for a patient that involves evaluating someone in order to figure out what is wrong. They are many types of psychological assessments, all of which have their own strengths and weaknesses.
- One of the clinical methods of studying personality is through life history.
- A psychologist collects the information from the person himself.
- The task psychologist to collect information is very different from that of biographer or a police officer.

AIMS-OBJECTIVES:

Aim: the participants will have knowledge on the patient centered clinicalmethod.

Objectives: be able to

- State Levenstein's patient centered clinical method principles.
- Discuss the diagnostic process in family practice
- Describe the common errors done during a diagnostic process.
- Discuss how time can be used as a diagnostic tool in general practice.

USES:

- ❖ It is an essential feature of all nutritional surveys. It is the simplest and most practical method of ascertaining the nutritional status of a group of individuals.
- ❖ It utilizes a number of physical signs, (specific & non specific), that are known to be associated with malnutrition and deficiency of vitamins and micronutrients.
- ❖ Needs trained personnel and facilities

4. DIETARY ASSESSMENT METHODS:

Accurately assessing dietary intake is an important element of metabolic research. The **three most common methods** used to assess dietary intake are the following:

i) DIET RECORD:

Subjects record all food and beverages consumed over three consecutive days (two weekdays and one weekend day). The consumed items can be measured using a scale or other household items, such as measuring cups or spoons, or estimated using a portion-size guide. Trained staff must provide detailed instructions on how to record intake and the completed records need to be entered into a software program, such as Nutrition Data System for Research (NDSR), for analysis.

ii) 24-Hour Recall:

Subjects are asked to report all foods and beverages consumed in the past 24 hours. This can be done via telephone or face-to-face interview. Trained staff must conduct the interview to prompt for details, such as cooking methods and portion sizes. The data needs to be entered into a software program, such as NDSR, for analysis.

iii) Food Frequency Questionnaire (FFQ):

Subjects report how frequently certain food and beverage items were consumed over a specific period of time (typically 1 year). Most FFQ versions ask portion size questions of every food item, as well as general questions about common cooking practices (e.g. type of fat typically added while cooking). Most FFQs are available in paper or

electronic format and take about 1 hour to complete. Computerized software programs calculate nutrient intake by multiplying the reported frequency of each food by the amount of nutrient in a serving of that food. There are no data entry requirements for the study team. FFQs are usually validated for a period of 6

months or 1 year and repeat administration is not recommended for a period shorter than 6 months.

There are advantages and disadvantages to each method as outlined below:

Method	Advantages	Disadvantages
Diet Record	• Intake is quantified • Does not require recall • Allows self-monitoring which can influence behavior change • Provides typical meal and food pattern information	• High subject burden • High staff cost and burden • Can alter eating behaviors • Requires literate population • Requires multiple records over several months to capture habitual intake
24-Hour Recall	• Intake is quantified • Less subject burden • Does not alter eating behaviors • Does not require literate population	• High staff cost and burden • Relies on subject recall • Requires multiple recalls over several months to capture habitual intake
Food Frequency Questionnaire	• Less subject burden • Less staff burden • Does not alter eating behaviors • Captures habitual intake	• Relies on subject recall • Not as quantifiably precise • Requires literate population • Does not provide meal pattern information • Cannot be used over short time periods

DIETARY ASSESSMENT PRINCIPLES:

ADEQUACY:

A diet that provides enough energy and nutrients to meet the needs according to the recommended dietary intakes/allowances (for healthy and active life)

BALANCE:

A diet that provides enough, but not too much of each type of food (adequacy of basic food groups)

VARIETY:

A diet that includes a wide selection of foods within each food group (dietary diversity/includes biodiversity – species, varieties, cultivars)

NUTRIENT DENSITY:

A diet includes foods that provide the most nutrients for the least number of calories (nutrient dense foods)

MODERATION:

A diet that limits intake of foods high in sugar and fat (nutrient intake goals/guidelines)

DIETARY ASSESSMENT:

Nutritional intake of human is assessed by five different methods. These are:

- 24hours dietary recall
- Food frequency questionnaire
- Dietary history since early life
- Food dairy technique
- Observed food consumption

CHOOSING AN APPROPRIATE METHOD:

The most important question to consider before implementing a dietary assessment tool is whether or not you are interested in habitual intake. A diet record completed over several days is more likely to generate accurate intake information than a single 24-hour recall. To choose between the two, consider how many days of intake are necessary, the literacy of your population and other population characteristics (e.g. will recall be an issue in an elderly population?)

If you are interested in capturing habitual intake, the next step is to consider the type of study you are conducting. Retrospective studies have no other option but to use a FFQ, while prospective studies can use any of these three methods. The study timeline, budget and population characteristics will help determine which of the three methods is more

appropriate.

UNIT – III

Nutritional Problems in the Community:

Importance of good nutrition, prevalence, etiology and measures to overcome malnutrition deficiency disorders-PEM, micro nutrient deficiencies (Vitamin A, Nutritional Anemia, IDD) over nutrition (obesity)- Prevalence, Causes, Complications and dietary guidelines. Food Adulteration-Definition, Adulterants in Different Foods, their ill effects and detection (house hold level techniques) Foods standards – BIS, Agmark and food laws.

IMPORTANCE OF GOOD NUTRITION:

- ✓ Eating a balanced diet is vital for good health and wellbeing.
- ✓ Food provides our bodies with the energy, protein, essential fats, vitamins and minerals to live, grow and function properly.
- ✓ We need a wide variety of different foods to provide the right amounts of nutrients for good health.
- ✓ Good nutrition is the key to good mental and physical health.
- ✓ Eating a balanced diet is an important part of good health for everyone.
- ✓ The kind and amount of food you eat affects the way you feel and how your body works.

Good nutrition is the key to your child's successful development. Use this helpful guide to recognize the **10 Signs of Good Nutrition** in your child.

1. APPROPRIATE HEIGHT & WEIGHT:

- ✓ The children's appropriate weight in relation to both age and height is a sign of good nutrition and their healthy growth.
- ✓ For a better assessment of this ratio, consult a pediatrician.
- ✓ Although genetics play an important role in your child's height, adequate high-quality protein in the diet is essential for optimal growth and development.

2. STRONG BONES:

- ✓ Strong bones are evidenced by your child's physique and a pediatrician's review.
- ✓ Strong bones and muscles allow your growing children to be better equipped to participate in physical activities, which in turn contribute to stronger bones and

muscles.

- ✓ The milk drink has both calcium and vitamin D, important nutrients that help build stronger, healthier bones

3. **HEALTHY SKIN:**

- ✓ Healthy skin is an important sign of good nutrition in children and vitamin A supports the maintenance and repair of your child's skin.

4. **GOOD VISION:**

- ✓ It is important to have your child's vision routinely evaluated when they visit the pediatrician's office.
- ✓ Take care of your child's vision by incorporating vitamin A into their diet, which supports good vision.

5. **MUSCLE DEVELOPMENT:**

- ✓ Muscle development is an important sign that your child is both well-nourished and is exercising properly.
- ✓ Although genetics play an important role in your child's height, adequate high-quality protein in the diet is essential for optimal growth and development.
- ✓ Proteins are the building blocks of the body that help tissue growth as well.

6. **STRONG TEETH:**

- ✓ Healthy and clean teeth are proof that your children's nutritional intake and habitual dental hygiene are good.
- ✓ Your child will eventually lose their milk or 'baby' teeth, which are then replaced by adult teeth.
- ✓ Calcium and vitamin D play important roles in supporting strong, healthy teeth.

7. **SHINY HAIR:**

- ✓ Shiny hair is a sign of a well-nourished child.
- ✓ Seafood such as tuna and salmon support shiny hair because they are a good source of omega 3 fatty acids. Foods that contain vitamin E and iron also support shiny hair.
- ✓ Good sources of vitamin E include nuts and seeds, and good sources of iron include lean meats and beans.

8. **HEALTHY NAILS:**

- ✓ Strong and healthy fingernails are a good indication that your child is getting the right amount of nutrients they need.

- ✓ Nails should appear uniform in color and free of discoloration.

- ✓ Health professionals recommend getting plenty of vitamins A and D, and calcium to support strong and healthy nails.

9. SLEEPING SOUNDLY:

- ✓ Sleeping well is a sign that your child is receiving good nutrition all through the day.
- ✓ It is essential for their growth and development, because many important physical and mental processes such as the release of growth hormones to stimulate the growth of bones, cartilages and tissues - takes place while they sleep.
- ✓ Children who get enough sleep will develop better memory, concentration and longer attention spans.
- ✓ They are also less prone to behavioral problems and moodiness.

10. BEING ACTIVE & ALERT:

- ✓ Attentiveness is one sign that your child is getting good nutrition through a healthy diet of nutrients essential for body and brain development.
- ✓ Intellectual development is in fact one of the most significant milestones of growth in early childhood.
- ✓ This stage requires the best nourishment possible - especially iron.

PREVALENCE:

- ❖ Prevalence in epidemiology is the proportion of a particular population found to be affected by a medical condition (typically a disease or a risk factor such as smoking or seat-belt use).
- ❖ It is arrived at by comparing the number of people found to have the condition with the total number of people studied.
- ❖ It is usually expressed as a fraction, as a percentage, or as the number of cases per 10,000 or 100,000 people.
- ❖ Prevalence estimates are used by epidemiologists, health care providers, government agencies, toxicologists, and insurers.
- ❖ Prevalence is contrasted with incidence, which is a measure of new cases arising in a population over a given period (month, year, etc.).
- ❖ The difference between prevalence and incidence can be summarized thus: prevalence

answers "How many people have this disease right now?" or "How many people have had this disease during this time period?" and incidence answers "How many people per year newly acquire this disease?"

- There are three category of prevalence **namely, Life time prevalence, Period prevalence and Point prevalence.**

1. LIFETIME PREVALENCE:

- Lifetime prevalence (LTP) is the proportion of individuals in a population that at some point in their life (up to the time of assessment) have experienced a "case", e.g., a disease; a traumatic event; or a behavior, such as committing a crime.
- Often, 12-month prevalence (or some other type of "period prevalence") is provided in conjunction with lifetime prevalence.
- Point prevalence is the prevalence of disorder at a specific point in time (a month or less).
- Lifetime morbid risk is "the proportion of a population that might become afflicted with a given disease at any point in their lifetime."

2. PERIOD PREVALENCE:

- Period prevalence is the proportion of the population with a given disease or condition over a specific period of time.
- It could describe how many people in a population had a cold over the cold season in 2006, for example.
- It is expressed as a percentage of the population and can be described by the following formula:
- **Period prevalence (ratio) = Number of cases that occurred in a given period ÷ Number of people in the population during this period**
- The relationship between incidence (rate), point prevalence (ratio) and period prevalence (ratio) is easily explained via an analogy with photography.
- Point prevalence is akin to a flashlight photograph: what is happening at this instant frozen in time.
- Period prevalence is analogous to a long exposure (seconds, rather than an instant) photograph: the number of events recorded in the photo whilst the camera shutter was open.
- In a movie each frame records an instant (point prevalence); by looking from frame to frame one notice new events (incident events) and can relate the number of such events to a period (number of frames); see incidence rate.

3. POINT PREVALENCE:

- Point prevalence is a measure of the proportion of people in a population who have a disease or condition at a particular time, such as a particular date.

- ❖ It is like a snap shot of the disease in time. It can be used for statistics on the occurrence of chronic diseases. This is in contrast to period prevalence which is a measure of the
  proportion of people in a population who have a disease or condition over a specific period of time, say a season, or a year.
- ❖ **Point prevalence can be described by the formula: Prevalence = Number of existing cases on a specific date ÷ Number of people in the population on this date**

ETIOLOGY:

- Etiology is the study of causation, or origination.
- The word is derived from the Greek aitiología, "giving a reason for the word is most commonly used in medical and philosophical theories.
- It is used to refer to the study of why things occur, or even the reasons behind the way that things act, and is used in philosophy, physics, psychology, government, geography, spatial analysis, medicine, theology, and biology in reference to the causes of various phenomena.
- An etiological myth is a myth intended to explain a name or create a mythic history for a place or family, an origin story.

MEDICINE:

- In medicine, etiology refers to the many factors coming together to cause an illness.
- It is normally the focus of epidemiological studies. The etiology of scurvy is a good example. With scurvy, sailors going to sea often lacked fresh vegetables.
- Without knowing the precise cause, Captain James Cook suspected scurvy was caused by the lack of vegetables in the diet.
- Based on his suspicion, he forced his crew to eat sauerkraut, a cabbage preparation, every day, and based upon the positive outcomes, he inferred that it prevented scurvy, without being able to say precisely how it might have worked.
- It was only about two centuries later, in 1926, that it was discovered that it was the lack of vitamin C in a sailor's diet that was the basic cause of scurvy.

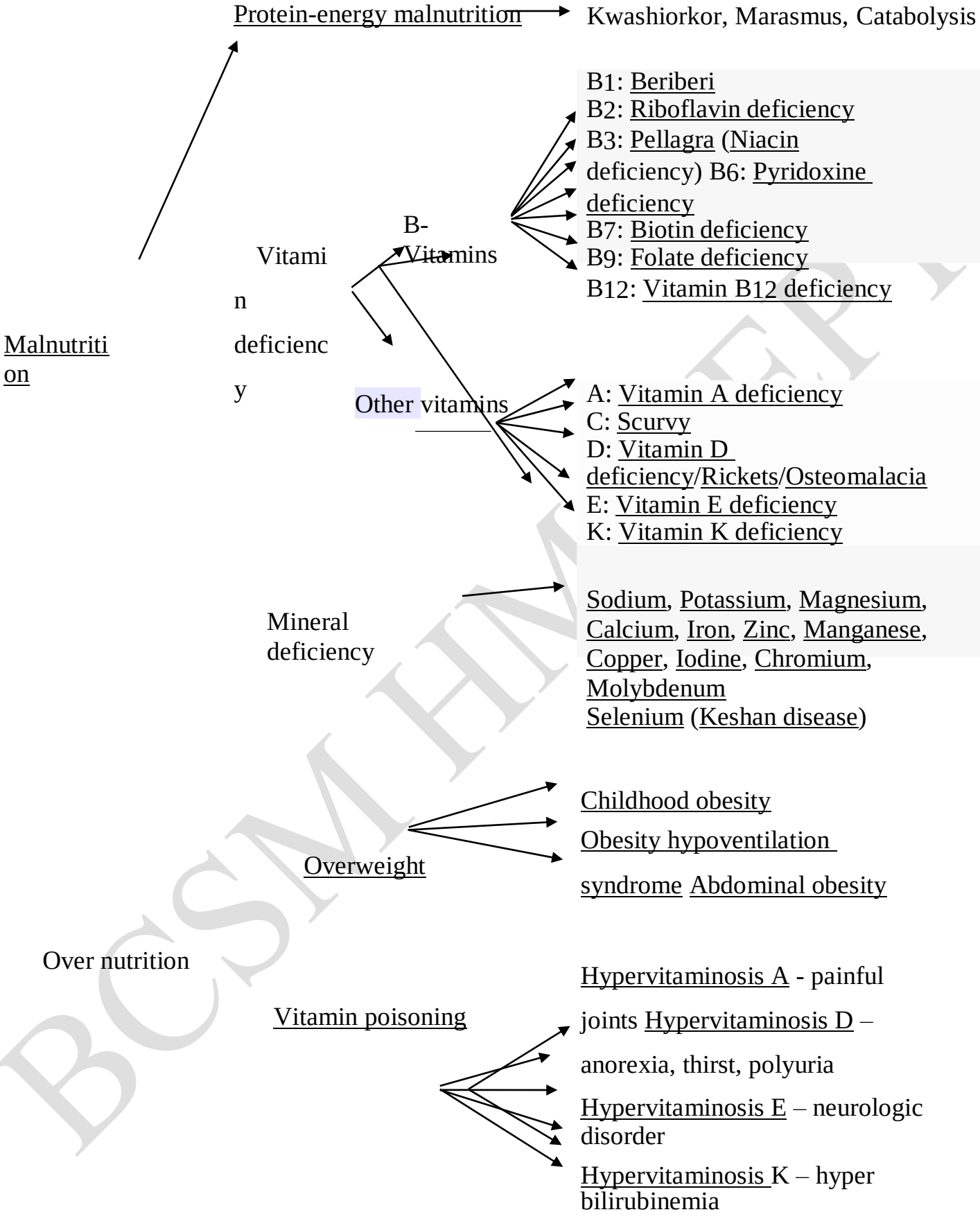
MALNUTRITION:

- **Malnutrition** is a condition that results from eating a diet in which nutrients are either not enough or are too much such that the diet causes health problems.
- It may involve calories, protein, carbohydrates, vitamins or minerals.

- Not enough nutrients are called **under nutrition** or **undernourishment** while too much is called over nutrition**.**
- Malnutrition is often used to specifically refer to under nutrition where an individual is not getting enough calories, protein, or micronutrients.
- If under nutrition occurs during pregnancy, or before two years of age, it may result in permanent problems with physical and mental development.
- Extreme undernourishment, known as starvation, may have symptoms that include: a short height, thin body, very poor energy levels, and swollen legs and abdomen.
- There are **two main types of under nutrition**:
  - ✓ Protein-energy malnutrition and
  - ✓ **Dietary deficiencies**.
- Protein-energy malnutrition has two severe forms: marasmus (a lack of protein and calories) and kwashiorkor (a lack of just protein).
- Common micronutrient deficiencies include: **a lack of** iron**,** iodine**, and** vitamin A.

PROTEIN-ENERGY MALNUTRITION:

- Under nutrition is sometimes used as a synonym of protein–energy malnutrition (PEM).
- They are including both micronutrient deficiencies and **protein energy malnutrition** in its definition.
- The term "severe malnutrition" or "severe under nutrition" is often used to refer specifically to PEM.
- PEM is often associated with micronutrient deficiency. Two forms of PEM are kwashiorkor and marasmus. PEM is one of the major nutritional problems in our country. It can occur at any age, but it mainly affects the young children. It results due to:
  - ✓ Lack of energy and proteins
  - ✓ Lack of proteins alone in the diet.



The body gets energy from carbohydrates and fats. When these are not present in adequate

amounts in the diet, the body cannot meet its energy needs. It then uses proteins for the supply of energy thereby resulting in deficiency of proteins in the body, hence PEM.

Low energy (carbohydrates and fats) intake

leads to

Deficiency of energy in the

body leads to

Use of proteins for giving energy because the availability of carbohydrates is low

leads to

Deficiency of proteins in the

body

Marasmus	**Kwashiorkar**
Causes: Deficiency of both energy and proteins	Deficiency of proteins alone
Age group: Before 12 months of age	Young children between 1-3 years of age
Signs and symptoms: Loose and wrinkled skin due to loss of fat beneath the skin Shrunken abdomen Hunger Diarrhoea (often)	Oedema/swelling due to water accumulation in the body especially on face, arms and legs Pot belly Loss of appetite Skin rash which tends to peel off Light coloured hair which are easy to pull Liver enlargement

KWASHIORKOR*:*

Kwashiorkor is mainly caused by inadequate protein intake. The main symptoms are edema, wasting, liver enlargement, hypoalbuminaemia, steatosis, and possibly depigmentation of skin and hair. Kwashiorkor is further identified by swelling of the belly,

which is deceiving of actual nutritional status. The term means ‘displaced child’ and is derived from a Ghana language of West Africa, means "the sickness the older one gets when the next baby is born," as this is when the older child is deprived of breast feeding and weaned to a diet composed largely of carbohydrates.

MARASMUS:

Marasmus ('to waste away') is caused by an inadequate intake of protein and energy. The main symptoms are severe wasting, leaving little or no edema, minimal subcutaneous fat, severe muscle wasting, and non-normal serum albumin levels. Marasmus can result from a sustained diet of inadequate energy and protein, and the metabolism adapts to prolong survival. It is traditionally seen in famine, significant food restriction, or more severe cases of anorexia. Conditions are characterized by extreme wasting of the muscles and a gaunt expression.

DIETARY DEFICIENCY:

- **Dietary deficiency or Micronutrient deficiency** is not enough of one or more of the micronutrients required for optimal plant or animal health.
- In humans and other animals they include both vitamin deficiencies and mineral deficiencies, whereas in plants the term refers to deficiencies of essential trace minerals.
- Micronutrient deficiencies affect more than two billion people of all ages in both developing and industrialized countries.
- They are the cause of some diseases, exacerbate others and are recognized as having an important impact on worldwide health.
- Important micronutrients include iron, cobalt, chromium, copper, iodine, manganese, selenium, zinc, molybdenum and vitamins A, B6, B12, B1, B2, B3, and C.

B1:Thiamine deficiency	Beriberi
B2: Riboflavin deficiency	Dark red tongue dermatitis and cheilosis
B3: Pantothenic acid deficiency	Muscle weakness, abdominal disorder
B6: Pyridoxine deficiency	Severe dermatitis

B7: Biotin deficiency	Nausea, muscular pain
B9: Folic acid deficiency	Megaloblastic anemia, diarrhea (deficiency of RBC)

B12 :Cyanogobalamine deficiency	Pernicious anemia
Vitamin - C	scurvy
Vitamin - A	Xerophthalmia, night blindness / nictalopia
Vitamin – D	Rickets
Vitamin – E	Neurologic disorder
Vitamin - K	Antihaemorrhagic vitamin, pancreatic disfunction

1. VITAMIN A DEFICIENCY:

- **Vitamin A deficiency** (**VAD**) or **hypovitaminosis A** is a lack of vitamin A in blood and tissues.
- The three forms of vitamin A include retinols**, beta-carotenes, and** carotenoids**.**
- The lack of vitamin A in the diet leads to vitamin A deficiency.

SIGNS AND SYMPTOMS:

- ✓ Eye changes begin with night blindness, that is, inability to see when it is dark. If it is not treated, it leads to complete blindness.
- ✓ Nyctalopia (night blindness) is one of the first signs of VAD.
- ✓ Xerophthalmia, keratomalacia, and complete blindness can also occur since vitamin A has a major role in phototransduction.
- ✓ Drying of the white portion of the eye.
- ✓ Increased rate of infections especially of the respiratory system.

2. NUTRITIONAL ANEMIA:

- **Nutritional anemia** refers to the low concentration of hemoglobin due to poor diet. According to the World Health Organization, a hemoglobin concentration below 7.5 mmol/L and 8. mmol/L for women and men, respectively, is considered to be **anemic**. Thus, **anemia** can be diagnosed with blood tests.

- Haemoglobin is the red pigment in the blood and it helps in carrying oxygen to different parts of the body. Haemoglobin level decreases when iron is deficient in the diet.
- In other words anemia is caused due to deficiency of iron.

- Anemia can also be caused when there is lack of folic acid and vitamin Bl2 in the diet.

SIGNS AND SYMPTOMS:

- ✓ General body weakness. The person complains of tiredness and breathlessness.
- ✓ Loss of appetite.
- ✓ Paleness of tongue, white portion of eye and nail beds.
- ✓ Feeling of being pricked with pins and needles on the fingers and toes.
- ✓ Brittle and spoon shaped nails.
- ✓ The capacity of a person to work decreases considerably.

3. IODINE DEFICIENCY DISORDERS: (IDD)

- A lack of sufficient **iodine** in the diet, which can lead to inadequate production of thyroid hormone (hypothyroidism) and enlargement of the thyroid gland (goiter).
- Iodine is an important component of thyroxine hormone.
- This hormone controls most of the metabolic processes of the body.
- Iodine deficiency is most commonly seen as goiter in adults and cretinism in young children.
- Iodine deficiency during pregnancy is harmful both for the mother and child.
- These are not the only problems of iodine deficiency disorders (IDD).

SIGNS AND SYMPTOMS:

IN ADULTS,

- The neck becomes swollen. This is called goitre.
- The person may become fat.
- The person feels tired and is unable to work properly.
- Skin changes may also occur.

IN YOUNG CHILDREN,

- Growth retardation
- Mental retardation
- Speech and hearing defects
- Disorders of nerves and muscles causing inability to control movements of limbs.

OVER NUTRITION:

- **Over nutrition** or **hyperalimentation** is a form of malnutrition in which the intake of nutrients is oversupplied. The amount of nutrients exceeds the amount required for normal growth, development, and metabolism.
- ***Obesity*** is defined as excess adipose tissue.
- It is a medical condition in which excess body fat has accumulated to the extent that it may have a negative effect on health.
- It is most commonly caused by a combination of excessive food intake, lack of physical activity, and genetic susceptibility.
- There are several different methods for determining excess adipose (fat) tissue; the most common being the Body Mass Index (BMI)
- BMI is defined as the subject's weight divided by the square of their height and is calculated as follows.

$$BMI=\frac{m}{h2}$$

BMI (kg/m^2)		classification
From	upto	Under weight
	18.5	Normal weight
18.5	25.0	Over weight
25.0	30.0	Class I obesity
30.0	35.0	Class II obesity
35.0	40.0	Class III obesity
40.0		

STRATEGIES TO PREVENT MALNUTRITION AND IMPROVE NUTRITION:

1. Nutritional planning
2. Direct nutrition and health interventions

There are two major approaches in addressing malnutrition.

Nutritional planning

Direct nutrition and health development

1. NUTRITIONAL PLANNING:

This involves political commitment by the government. A well planned and well executed long term project can accelerate the developmental process and the benefits can be rewarding and permanent.

Nutritional planning involves formulation of a nutrition policy and overall long term planning to improve production and supplies of food, ensure its equitable distribution and programs to increase the purchasing power of people. This may include, land reforms, proper guidance in agriculture to help farmers to get better yields from their lands, help in proper marketing of farm produce. To help increasing the capacity of people to buy nutritious food in adequate quantity, income generating activities for the weaker sections of the community, making available good quality food in affordable prices through proper public distribution system, etc are some of the plans for the government to implement.

2. DIRECT NUTRITION AND HEALTH INTERVENTIONS:

IMPROVED HEALTH CARE SYSTEM:

Infections like malaria, measles and diarrhea are prevalent in our society and they precipitate acute malnutrition among children and infants. A good health care system that provides immunization, oral rehydration, periodic deforming, early diagnosis and proper treatment of common illnesses can go a long way in preventing malnutrition in the society.

FOOD ADULTERATION:

- Adulteration is an addition of another substance such as mixing, substitution, abstraction, concealing the quality, putting up decomposed food for sale, misbranding or giving false labeling and addition of toxicants to food, which are having adverse effect on the health of the consumer, is called as food adulteration.
- These food item in order to increase the quantity of the food item in raw form or prepared form, which may result in the loss of actual quality of food item.
- These substances may be other available food items or non-food items.
- Among meat and meat products some of the items used to adulterate are water or ice,

carcasses, or carcasses of animals other than the animal meant to be consumed.

- **Adulteration** usually refers to mixing other matter of an inferior and sometimes harmful quality with food or drink intended to be sold. As a result of **adulteration**, food or drink becomes impure and unfit for human consumption.

FOOD COLORS:

Food adulteration is the process in which the quality of food is lowered either by the addition of inferior quality material or by extraction of valuable ingredient. It not only includes the intentional addition or substitution of the substances but biological and chemical contamination during the period of growth, storage, processing, transport and distribution of the food products, is also responsible for the lowering or degradation of the quality of food products. Adulterants are those substances which are used for making the food products unsafe for human consumption.

Food products are said to be adulterated if their quality is adversely affected by adding of any substance which is injurious to health or by abstracting a nutritious substance.

A FOOD ITEM IS SAID TO BE ADULTERATED IF:

- A substance which is added is injurious for human consumption.
- An inferior substance substitutes wholly or partly.
- A valuable ingredient has been abstracted from the food product, wholly or in part.

Various types of adulterants found in the food products are as follows:

1. Intentional adulterants; like coloring agents, starch, Pepperoil, injectable dyes and others.
2. Incidental adulterants; like pesticide residues, larvae in foods, droppings of rodents.
3. Metallic contaminants; like lead, arsenic, effluent from chemical industries etc.

TYPES OF FOOD ADULTERANTS:

Type	Substances Added
Intentional Adulterants	Addition of sand, marble chips, stones, mud, other filth, talc, chalk powder, water, mineral oil and harmful

	colour.
Incidental adulterants	Pesticide residues, droppings of rodents, larvae in foods.
Metallic contamination	Arsenic from pesticides, lead from water, mercury from effluent, tins from cans, etc...

Packaging Hazards	Polyethylene, polyvinyl chloride and allied compounds are used to produce flexible packaging material.

COMMON ADULTERANTS:

Food grains and grams	**:**	Marble pieces, sand particles, clay gilts, soap stone pieces.
Pulses	**:**	Kesari dhal – colours.
Wheat flow maida	**:**	Powdered lime – talcum powder
Turmeric powder (Haldi)	**:**	Metanil yellow
Pepper	**:**	Dry papaya seeds.
Chilli powder	**:**	Coloured saw dust.
Sweets	**:**	Colours not permitted.
Honey	**:**	Jaggery – sugar.
Tea	**:**	coloured tea leaves after removing the essence.

TYPES OF REACTION:

Allergic reaction arising due to food allergy are of two types namely, immediate reaction and delayed reaction.

SYMPTOMS:

Skin manifestations examples include cancer sores, purities, urinary diseases.

FOUR TYPES OF DIFFERENT FOOD ADULTERATION AND ITS HARMFUL EFFECTS:

Food adulteration is the addition or mixing of inferior, harmful, substandard, useless or unnecessary substances to foods. This spoils the nature and quality of food items and is considered food adulteration.

1. MILK ADULTERATION:

In India, which is the land of cows, large quantities of milk are adulterated. Milk adulteration involves adding water to milk and removing the beneficial fats from milk.

Often soya milk, starch, groundnut milk, and wheat flour are added to milk. This makes the milk less nutritious and it results in milk being useless for the consumer.

2. ADULTERATION OF FATS AND OILS:

It is easy to adulterate oils and fats. But it is difficult to detect such adulteration. Ghee is often mixed with hydrogenated oils and animal fats. Synthetic colours and flavours are added to other fats to make them appear like ghee.

3. FOOD GRAIN ADULTERATION:

Food grain adulteration involves mixing sand or crushed stones to increase the weight of food grains. Cereal grains and pulses are mixed with plastic beads that resemble grains in colour and size. Very often, water is also sprayed on grains to increase the weight.

4. OTHER ADULTERATIONS:

Chilli powder is often mixed with brick powder, while tea leaves are often mixed with used tea leaves. These adulterations are very harmful to the consumer and they should be addressed by consumer organizations and consumers seriously.

METHODS FOR DETECTION OF COMMON ADULTERANTS IN FOOD:

1. Milk and Milk Products
2. Oil and Fats
3. Sweetening Agents
4. Food grains and their products
5. Spices
6. Miscellaneous Products

1. MILK AND MILK PRODUCTS:

S.No	Food Article	Adulterant	Method for Detection
1	Milk	water	The presence of water can be by putting a drop of milk on a polished slanting surface. The drop of pure milk either or flows lowly leaving a white trail behind it, whereas milk adulterated water will flow immediately without leaving a mark

2		Starch	Add a few drops of tincture of Iodine or Iodine solution. Formation of blue colour indicates the presence of starch.
3		Urea	Take a teaspoon of milk in a test tube. Add ½ teaspoon of soybean or arhar powder. Mix up the contents thoroughly by shaking the test tube. After 5 minutes, dip a red litmus paper in it. Remove the paper after ½ a minute. A change in colour from red to blue indicates the presence of urea in the milk.
4		Vanaspati	Take 3 ml of milk in a test tube. Add 10 drops of hydrochloric acid. Mix up one teaspoonful of sugar. After 5 minutes, examine the mixture.The red colouration indicates the presence of vanaspati in the milk.
5		Detergent	Shake 5-10 ml. of sample with an equal amount of water lather indicates the presence of detergent.

2. OIL AND FATS:

S. No	**Food Article**	**Adulterant**	**Method for Detection**	**Remarks**

1	Ghee	Vanaspathy or Margarine	Take about one tea spoon full of melted sample of Ghee with equal quantity of concentrated Hydrochloric acid in a stoppered test tube and add to it a pinch of sugar. Shake for one minute and let it for five minutes. Appearance of crimson colour in lower (acid) of Vanaspati or Margarine.	The test is specific for sesame oilWhich is compulsorily added to Vanaspati and Margarine. Some coal tar colours also give a positive test. If the test is positive i.e. red colour develops only by adding strong Hydrochloric acid (without adding crystals of sugar) then the sample is adulterated with coal tar dye. If the crimson or red colour develops after adding and shaking with sugar, then alone Vanaspati or Margarine is present

2	Butter	Vanaspati or Margarine	Take about one teaspoon full of melted sample of butter with equal quantity of concentrated Hydrochloric acid in a stoppered test tube and add to it a pinch of sugar. Shake for one minute and let it for five minutes. Appearance of crimson colour in lower (acid) of Vanaspati or Margarine.	The test is specific for seasame oil which is compulsorily added to Vanaspati and Margarine. Some coal tar colours also give a positive test. If the test is positive i.e. red colour develops only by adding strong Hydrochloric acid (without adding crystals of sugar) then the sample is adulterated with coal tar dye. If the crimson or red colour develops after adding and shaking with sugar, then alone Vanaspati or Margarine is present

3. SWEETENING AGENTS:

S. No	Food Article	Adulterant	Method for Detection
1	Sugar	Chalk powder	Dissolve 10 gm of sample in a glass of water, allow settling, Chalk will settle down at the bottom.
2		Urea	Dissolve 10 gm of sample in a glass of water, allow settling, Chalk will settle down at the bottom.
3		Chalk powder	Dissolve 10 gm of sample in a glass of water, allow to settle,chalk will settle down at the bottom.

4		Yellow colour (Non -permitted)	Take 5 ml in a tests tube from the above solution and add a few drops of conc. HCl. A pink colour in lower acid layers shows the presence of non- permitted colour.

5	Honey	Sugar solution	A cotton wick dipped in pure honey when lighted with a match stick burns and shows the purity of honey. If adulterated, the presence of water will not allow the honey to burn, If it does; it will produce a cracking sound.
6	Jaggery	Washing soda	Add a few drops of solution HCl. Effervesence shows presence of washing soda.
7	Jaggery	Chalk powder	Dissolve a little amount sample in water in a test tube,chalk powder settles down.-Or- Add a few drops of conc HCl solution,effervescence indicates the presence of adulterant.

4. FOOD GRAINS AND THEIR PRODUCTS:

S. No	Food Article	Adulterant	Method for Detection	Remarks
1	Wheat, Rice, Maize, Jawar, Bajra, Chana, Barley etc.	Dust, pebble, Stone, Straw,weed seeds,damaged grain,weevilled grain, insects, hair and excreta of rodent	These may be examined visually to see foreign matter, damaged grains, discoloured grains, insect, rodent contamination etc.	Damaged/discoloured grains should be as low as possible since they may be affected by fungal toxins, argemone seeds, Dhatura seeds etc. In moderately excessive amount can result in risk to health, Discard the damaged undesirable grains before use

2	Maida	Resultant atta or cheap flour	When dough is prepared from resultant or left out atta, more water has to be used. The normal taste of chapattis prepared out of wheat is somewhat sweetish whereas those repaired out of adulterated wheat will taste insipid.	

3	Maida / Rice	Boric Acid	Take a small amount of sample in a test tube, add some water and shake. Add a few drops of HCl. Dip a turmeric paper strip if it turns red, boric acid is present.	
4	Wheat, bajra and other grains	Ergot (a fungus containing poisonous substance)	(i) Purple black longer sized grains in Bajra show the presence of Ergots. (ii) Put some grains In a glass tumbler containing 20 per cent salt solution (20 gm common salt to 100 ml water)purple black longer size grain Ergot floats over the surface while sound grains settle down.	
5	Wheat, bajra and other grain	Dhatura	Dhatura seeds are flat with edges with blackish brown colour which can be separated out by close examination.	
6	Whea t flour	Excess bran	Sprinkle on water surface. Bran will float on the surface.	
7	Whea t flour	Chalk powder	Shake sample with dil.HCl Effervescence indicates chalk	Chalk powder is used as an adulterant due to its weight.

5. SPICES

S.No	Food Article	Adulterant	Method for Detection
1	Whole spices	Dirt, dust, straw, insect, damaged seeds, other seeds, rodent hair and excrete	These can be examined visually
2	Black pepper	Papaya seeds	Papaya seeds can be separated out from pepper as they are shrunken, oval in shape and greenish brown or brownish black in colour.
3		Light black pepper	Float the sample of black pepper in alcohol (rectified spirit). The black pepper berries sink while the papaya seeds and light black pepper float. (ii) Press the berries with the help of fingers light peppers will break easily while black berries of pepper will not break.
4		Coated with mineral oil	Black pepper coated with mineral oil gives Kerosene like smell.
5	Powdered spices	Added starch	Add a few drops of tincture of Iodine or Iodine solution. Indication of blue colour shows the presence of starch.
6	Powdered	Common Salt	Taste for addition of common salt.

	spices		

7	Turmeric powder	Coloured saw dust	Take a tea spoon full of turmeric powder in a test tube. Add a few drops of concentrated Hydrochloric acid. Instant appearance of pink colour which disappears on dilution with water shows the presence of turmeric If the colour persists, metanil yellow (an artificial colour) a not permitted coal tar colour is present.
8		Artificial colours	Sprinkle the chilli powder on a glass of water. Artificial colorants descend as coloured streaks.

6. MISCELLANEOUS PRODUCTS

S.No	Food Article	Adulterant	Method for Detection
1	Common salt	White powdered	Stir a spoonful of sample of salt in a glass of water. The presence of chalk will make solution white and other insoluble impurities will settle down.
2	Iodized salt	Common salt	Cut a piece of potato, add salt and wait minute and add two drops of lemon juice. If iodized salt blue colour will develop. In case of common salt, there will be no blue colour.
3		Iron fillings	By moving a magnet through the sample, iron filling can be separated.
4	Catachu powder	Chalk	Chalk gives effervescence (gives off bubbles) with concentrated Hydrochloric acid
5	Vinegar	Mineral Acid	Test with the Metanil yellow indicator paper, in case, the colour changes from yellow to pink,mineral acid is present

DISADVANTAGES OF FOOD ADULTERATION:

- Overpaying for substandard food.

- Adulterants are injurious to health and can result in death.
- Most of the nutrients of the food is lost.
- Polished and milled rice results in loss of iron and vitamin B.
- White flour can cause unhealthy weight loss and loss of nutrients.,

LEADS TO VARIOUS DISEASES:

Due to the consumption of **adulterated food**, we can get various chronic diseases like Liver Disorder, Diarrhoea, Stomach Disorder, Lahyrism Cancer, Vomiting, Dysentery, Cancer, Joint Pain, Heart Diseases, **and Food** Poisoning etc.

Symptoms like headache, gastro-intestinal disorders, muscular pain, drowsiness etc., appear, if adulterated food substances are used regularly.

PREVENT FOOD ADULTERATION:

- Food is one of the basic necessities for sustenance of life.
- Pure, fresh and healthy diet is most essential for the health of the people.
- It is no wonder to say that community health is national wealth.
- Adulteration of food-stuffs was so rampant, widespread and persistent that nothing short of a somewhat drastic remedy in the form of a comprehensive legislation became the need of the hour.
- To check this kind of anti-social evil a concerted and determined onslaught was launched by the Government by introduction of the Prevention of Food Adulteration Bill in the Parliament to herald an era of much needed hope and relief for the consumers at large.
- Development of stricter monitoring programs to screen all food products for safety is the only way to secure food supply and address the growing concern over food adulteration. Without access to healthy foods, a nutritious diet that is necessary for good health is out of reach.

PREVENTION OF FOOD ADULTERATION ACT, 1954:

- Fruit products order, 1955
- Meat food products order, 1973
- Vegetable oil products (Control) order, 1947
- Edible oils packing (Regulation) order, 1988
- Solvent extracted oil, De-Oiled Meal and Edible Flour (Control) order, 1967
- Milk and Milk Products Order, 1992 etc.

FOOD STANDARD:

- It is defined as a set of criteria that a food must meet if it is to be suitable for human consumption, such as source, composition, appearance, freshness, permissible additives, and maximum bacterial content.

- The standard helps organizations to identify and control food safety hazards. Due to the enhanced international trade in food products, international standards are needed to ensure the safety of global food supply chain.

MEANING AND IMPORTANCE OF STANDARDS AND STANDARDIZATION:

- A standard is a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose.
- Product standards and code of practice assist manufacturers to produce commodities that meet minimum specifications for quality and safety.
- Standardization is a process of ensuring uniformity in products and services by use of appropriate standards. The process ensures efficient utilization of resources through reduction of wastes.
- Food standards are documents containing requirements, specifications, guidelines or characteristics that can be used consistently to ensure that food materials, products, processes and services produced are fit for human consumption.
- In any country, food standards are established by regulatory authorities and enforced by governments, food companies and retailers.

IMPORTANCE OF FOOD STANDARDS:

- Safeguards the health of consumers.
- Ensure confidence of consumers in the food systems (from farm to table).
- Enable consumers to make informed decisions concerning the food they purchase.
- Used to differentiate different food products.
- Used to communicate product quality and safety to consumers.
- Used as a competitive strategy to enhance product marketing- (standards provide opportunities to companies/firms who use them to their competitive advantage).

BENEFITS OF ISO STANDARDS:

- They ensure that products and services are safe, reliable and of good quality.
- They are strategic tools for minimizing waste and errors,

- They increasing productivity and enhance customer satisfaction.
- They level playing fields for developing countries and facilitate free and fair trade.

- They breaking barriers to international trade which assists food companies access new markets,
- They help to harmonize technical specifications of products and services making industry more efficient.
- Conformity to the above international standards helps reassure consumers that products are safe, efficient and good for the environment.

BUREAU OF INDIAN STANDARDS (BIS):

- The Bureau of Indian Standards (BIS) is the national Standards Body of India working under the aegis of **Ministry of Consumer Affairs, Food & Public Distribution, and government of India.**
- It is established by the Bureau of Indian Standards Act, 1986.
- The Minister in charge of the Ministry or Department having administrative control of the BIS is the ex-officio President of the BIS.

BIS PURPOSE:

BEFORE INDEPENDENCE PERIOD:

- Scattered standardization activity
- Confined to a few Government purchasing organization

AFTER INDEPENDENCE:

- Economic development through resources thus needed the standardization for industries for competitive efficiency and quality production.
- The Indian Standards Institution gave the nation the standards it needed for nationalization, orderly industrial and commercial growth, quality production and competitive efficiency.

OBJECTIVES :(MAIN ACTIVITIES)

- Harmonious development of standardization, marking and quality certification
- To provide new thrust to standardization and quality control
- To evolve a national strategy for according recognition to standards and integrating

them with growth and development of production and exports

BUREAU OF INDIAN STANDARDS (BIS): (INDIAN STANDARDS INSTITUTION)

REGULATION:

- Prescribing of standards, formulation of standards, specification of foods, standards for limit of toxic compounds as applicable.
- Implementation of regulation by promotion through its voluntary and third party certification system, specifying of packaging and labeling requirements.

SPECIAL FEATURES:

General cover on hygienic conditions of manufacture, raw material quality and safety are given. Quality and safety oriented standards.

AGMARK:

ETYMOLOGY:

- The term agmark was coined by joining the words 'Ag' to mean agriculture and "mark" for a certification mark.
- This term was introduced originally in the bill presented in the parliament of India for the Agricultural Produce (Grading and Marking) Act.
- The entire system of Agmark, including the name, was created by **Archibald Macdonald Livingstone**.
- Agricultural and Marketing Advisor to the Government of India, from 1934 to 1941. He was supported by a staff of several hundred.
- This system was designed to benefit local growers throughout India.
- The absence of a certification as to quality, exposed to receiving less for their produce from dealers than its true worth.

AGMARK LABORATORY:

- The central AGMARK laboratory (CAL) in Nagpur and Regional AGMARK laboratories (RALs) in 11 nodal cities namely, Mumbai, New Delhi, Chennai, Kolkata, Kanpur, Kochi, Guntur, Amritssar, Jaipur, Rajkot, Bhopal.
- Each of the regional laboratories is equipped with and specializes in the testing of

products of regional significance.

- Hence the product range that could be tested varies across the centers.

FOOD LAWS:

- The notion of "food law" is defined in article 3 (1) of the regulation(EC) No 178/20002 of 28 January 2002 laying down the general principles and requirements of food law, established the European Food Safety Authority and laying down procedures in matters of food safety.
- Accordingly, the laws, regulations and administrative provisions governing food in general and food safety in particular, whether at community or national level, covers any stage of production, processing and distribution of food, and also of feed produced for, or fed to, food producing animals.

The **BIS hallmark** is a hallmarking system for gold as well as silver jewellery sold in India certifying the purity of the metal. It certifies that the piece of jewellery conforms to a set of standards laid by the Bureau of Indian Standards, the national standards organization of India.

Food safety refers to the conditions and practices that preserve the quality of **food** to prevent contamination and **food**-borne illnesses. The **Food Safety** and Inspection Service of the USDA educate consumers about the importance of **safe food** handling and how to reduce the risks associated with food borne illness.

FOOD BORNE DISEASES OR FOOD POISONING:

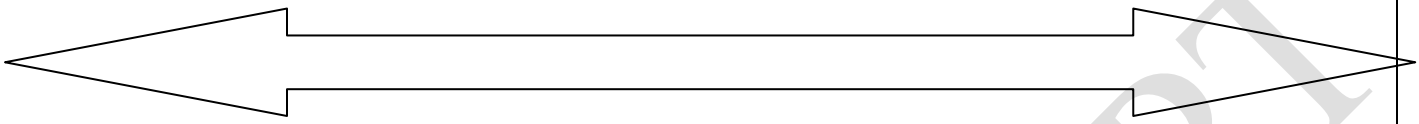
- **Bacterial intoxications**
- **Food borne infections**
- Other toxic infections
- Food borne diseases due to naturally occurring toxicants
- Epidemiology of food borne diseases
- Economic cost of food borne diseases

FOOD BORNE INTOXICATIONS OR FOOD POISONING IS CAUSED BY INGESTION:

- Of toxicants found as toxins of certain plants or animals.

- Toxin formed by microbes while they multiply in the foods or after entering the intestines.
- Poisonous substances that may be intentionally or incidentally added to foods during production, processing, transportation or storage.

- Toxicants or toxic substances in food are substances that are found in foods that can produce harmful effects on ingestion by humans and animals.



UNIT – IV

Nutrition programmes:

National nutrition policy, intervention programmes to combat malnutrition, ICDS programmes, Mid day meal programme. Role of international Organizations – UNICEF, FAO, WHO.

NUTRITION:

Nutrition is the science that interprets the interaction of nutrients and other substances in food in relation to maintenance, growth, reproduction, health and disease of an organism. It includes food intake, absorption, assimilation, biosynthesis, catabolism and excretion.

NUTRITION PROGRAMMES:

- In **community**-based **programs**, workers—often volunteers and part-time workers—interact with households to protect their health and **nutrition** and to facilitate access to treatment of sickness.
- Mothers and children are the primary focus, but others in the household should participate.
- Food and **Nutrition** Service, Find information on the **Food and Nutrition Service** (FNS), which administers the **Federal food and nutrition assistance programs** such as SNAP , WIC , and School Meals, provides better access to food, and promotes healthy eating through

nutrition education **programs**.

NATIONAL NUTRITION POLICY:

- The nutrition policy of 1993 outlines the nutritional status of India and the importance of such a document.
- At the time in 1993 there were already a number of mechanisms in place to address the issue of mal-nutrition and under-nutrition such as the Integrated Child Development Services (ICDS),
- Special Nutrition Programme, and Wheat Based Nutrition Programme etc.
- The policy outlines a few additional provisions to ensure proper nutrition of all populations.
- National Nutrition Policy (NNP) has been adopted by the Government in 1993.
- The National Nutrition Policy (NNP) identified key action in various areas having impact on nutrition such as agriculture, food production, food supply, education, information, health care, social justice, tribal welfare, urban development, rural development, labour, women and child development, people with special needs and monitoring and surveillance.
- The core strategy envisaged under NNP is to tackle the problem of nutrition through direct nutrition interventions for vulnerable groups as well as through various development policy instruments which will improve access and create conditions for improved nutrition.

The **direct short-term nutrition intervention** suggested by NNP includes:

- Nutrition interventions for specially vulnerable group such as children below 6 yrs, adolescent girls and pregnant and lactating women, expanding the safety nets, facilitating behaviour change among mothers, reaching the adolescent girls and ensuring better coverage of expectant women;
- Fortification of essential food items with appropriate nutrients;
- Popularization of low cost nutritious foods prepared from indigenous and locally available raw materials;
- Control of micronutrient deficiencies among vulnerable groups.

The **indirect long term nutrition interventions** leading to institutional and structural

changes including:

- (i) Food security for improved availability of food grains;
- (ii) Improvement of dietary patterns through production and demonstration;

- (iii) Policies for effecting income transfers so as to improve the entitlement package of the rural and urban poor improving the purchasing power and strengthening public distribution system;
- (iv) Land reforms measures for reducing vulnerabilities of landless and landed poor;
- (v) Strengthen health & family welfare programme;
- (vi) Imparting basis health and nutrition knowledge; (vii) Prevention of food adulteration;
- (viii) Improvement in nutrition surveillance;
- (ix) Monitoring of nutrition programmes;
- (x) Research into various aspects of nutrition;
- (xi) Equal remuneration for women;
- (xii) Communication through established media
- (xiii) Minimum wage administration to ensure its strict enforcement and timely revision and linking it with price rise through a suitable nutrition formula a special legislation for providing agricultural women labourers the minimum support, and at least 60 days leave by the employer in the last trimester of her pregnancy;
- (xiv) Community participation for generating awareness on NNP active participation of community members in management nutrition programmes & related interventions through beneficiaries committees, participation of women in food production & processing, promoting kitchen gardens, food preservation, preparation of weaning food, generating demand of nutrition services;
- (xv) Education and literacy;
- (xvi) Improvement in status of women.

OVERALL OBJECTIVE:

To reduce child and maternal mortality through nutritional interventions

SPECIFIC OBJECTIVE:

- Reduce general malnutrition among children and women, i.e. stunting, underweight, wasting, low BMI.
- Reduce iron deficiency anemia among children, children under age 2 year and pregnant women.

- Maintain and sustain iodine deficiency disorders and vitamin-A deficiency control activities.
- Improve maternal nutrition.
- Align with multi-sectoral nutrition initiative.
- Improve nutrition related behavior change and communication.

- Improve monitoring of nutrition related programs / activities.

THE IMPLEMENTATION STRATEGY INVOLVES,

- ✓ Setting up Inter Sectoral Coordination mechanism at Centre, State and district levels,
- ✓ Advocacy and sensitization of policy makers and programme managers,
- ✓ Intensifying micronutrient malnutrition control activities,
- ✓ Reaching nutrition information to people,
- ✓ Establishing nutrition monitoring and mapping at State, District and Community level, and
- ✓ Developing district-wise disaggregated data on nutrition.

NUTRITION-SENSITIVE INTERVENTIONS AND PROGRAMMES:

Interventions or programmes that address the underlying determinants of fetal and child nutrition and development-food security; adequate caregiving resource at the maternal, household and community levels; and access to health services and a safe and hygienic environment-and incorporate specific nutrition goals and actions

Nutrition-sensitive programmes can serve as delivery platforms for nutrition specific interventions, potentially increasing their scale, coverage and effectiveness.

EXAMPLE:

- Agriculture and food security
- Social safety nets
- Early child development
- Maternal mental health
- Women's empowerment
- Child protection
- Schooling
- Water, sanitation and hygiene
- Health and family planning services

NUTRITION-SPECIFIC INTERVENTIONS AND PROGRAMMES:

Interventions or programmes that address the immediate determinants of fetal and child nutrition and development-adequate food and nutrition intake, feeding care giving and parenting practices, and low burden of infectious diseases.

EXAMPLES:

- Adolescent, preconception, and maternal health and nutrition
- Maternal dietary or micronutrient supplementation
- Promotion of optimum breastfeeding
- Complementary feeding and responsive feeding practices and stimulation dietary supplementation
- Diversification and micronutrient supplementation or fortification for children
- Treatment of severe acute malnutrition
- Disease prevention and management
- Nutrition in emergencies

NUTRITION PROGRAMMES IN INDIA:

Ministry of Rural Development

- Applied nutrition programme

Ministry of Social Welfare

- Integrated child development services scheme
- Balwadi nutrition programme
- Special nutrition programe

Ministry of Health and Family Welfare

- National nutritional anemia prophylaxis programme
- National prophylaxis programme for prevention of blindness due to vitamin-A deficiency
- National iodine deficiency disorder control programme

Ministry of Education

- Mid-day meal programme

INTEGRATED CHILD DEVELOPMENT SERVICES (ICDS):

Integrated Child Development Services (**ICDS**) is a programme which provides food, preschool education, and primary healthcare to children less than 6 years of age and their mothers.

The scheme was however launched in 1975 but Morarji Desai Government discontinued it in 1978 but however from Tenth five year plan the central government started focusing more on its objective and relaunched it.

Tenth five year plan also linked ICDS to *Anganwadi* centres established mainly in rural areas and staffed with frontline workers.

In addition to fighting malnutrition and ill health, the programme is also intended to combat gender inequality by providing girls the same resources as boys.

A 2005 study found that the ICDS programme was not particularly effective in reducing malnutrition, largely because of implementation problems and because the poorest states had received the least coverage and funding.

The widespread network of ICDS has an important role in combating malnutrition especially for children of weaker groups.

Integrated Child Development Services	
Country	India
Launched	2 October 1975; 42 years ago

GENERAL CHARACTERTICS (BACKGROUND):

- Majority of children in India have underprivileged childhoods starting from birth. The infant mortality rate of Indian children is 44 and the under-five mortality rate is 93 and 25% of newborn children are underweight among other nutritional, immunization and educational deficiencies of children in India. Figures for India are substantially worse than the *country average*.
- ICDS was launched in 1975 in accordance to the National Policy for Children in India.

- Over the years it has grown into one of the largest integrated family and community welfare schemes in the world.

- Given its effectiveness over the last few decades, Government of India has committed towards ensuring universal availability of the programme.

SCOPE OF SERVICES:

The following services are sponsored under ICDS to help achieve its objectives:

1. Immunization
2. Supplementary nutrition
3. Health checkup
4. Referral services
5. Pre-school education
6. Nutrition and Health information

IMPLEMENTATION:

- For nutritional purposes ICDS provides 500 kilocalories (with 12-15 grams of protein) every day to every child below 6 years of age. For adolescent girls it is up to 500 kilo calories with up to 25 grams of protein every day.
- The services of Immunization, Health Check-up and Referral Services delivered through Public Health Infrastructure under the Ministry of Health and Family Welfare.
- UNICEF has provided essential supplies for the ICDS scheme since 1975.
- World Bank has also assisted with the financial and technical support for the programme.
- The cost of ICDS programme averages $10–$22 per child a year. The scheme is Centrally sponsored with the state governments contributing up to ₹1.00 (1.5¢ US) per day per child.
- Furthermore, in 2008, the GOI adopted the World Health Organization standards for measuring and monitoring the child growth and development, both for the ICDS and the National Rural Health Mission (NRHM).
- These standards were developed by WHO through an intensive study of six developing countries since 1997.
- They are known as New WHO Child Growth Standard and measure of physical growth, nutritional status and motor development of children from birth to 5

years age.

ICDS:

- Launched on 2nd October 1975.
- ICDS Scheme represents one of the world's largest and most unique programmes for early childhood development.
- ICDS is the foremost symbol of India's commitment to her children.
- India's response to the challenge of
  - ✓ Providing pre – school education on one hand and
  - ✓ Breaking the vicious cycle of malnutrition, morbidity, reduced learning capacity and mortality, on the other.

OBJECTIVES:

The Integrated Child Development Services (ICDS) scheme was launched in 1975 with the following objectives:

- Improve the nutritional and health status of children in the age-group 0 – 6 years.
- Foundation for proper psychological, physical and social development of the child.
- Reduce the incidence of mortality, morbidity, malnutrition and school dropout.
- Co – ordination of departments to promote child development.
- Nutrition and health education to the mother.

Beneficiary and Services	
Beneficiary	**Services**
Pregnant women	Health check-ups, TT, supplementary nutrition, health education.
Nursing Mothers	Health check-ups, supplementary nutrition, health education.
Children less than 3 years	Health check-ups, supplementary nutrition, immunization, referral services.
Children less than 3 - 6 years	Health check-ups, supplementary nutrition, immunization, referral services, non formal education.
Adolescent girls (11 – 18 years)	Supplementary nutrition, health education.

MID DAY MEAL PROGRAMME:

- The **Midday Meal Scheme** is a school meal programme of the Government of India designed to improve the nutritional status of school-age children nationwide.

- The programme supplies free lunches on working days for children in primary and upper primary classes in government, government aided, local body, Education Guarantee Scheme, and alternate innovative education centres, *Madarsa* and *Maqtabs* supported under Sarva Shiksha Abhiyan, and National Child Labour Project schools run by the ministry of labour.
- Serving 120,000,000 children in over 1,265,000 schools and Education Guarantee Scheme centres, it is the largest such programme in the world.
- Under article 24, paragraph 2c of the Convention on the Rights of the Child, to which India a party is, India has committed to providing "adequate nutritious foods" for children.
- The programme has undergone many changes since its launch in 1995.
- The Midday Meal Scheme is covered by the National Food Security Act, 2013.
- The legal backing to the Indian school meal programme is similar to the legal backing provided in the US through the National School Lunch Act.

PRE-INDEPENDENCE AND POST-INDEPENDENCE INITIATIVES:

- The roots of the programme can be traced back to the pre-independence era, when a mid day meal programme was introduced in 1925 in Madras Corporation by the British administration. A mid day meal programme was introduced in the Union Territory of Puducherry by the French administration in 1930.
- Initiatives by state governments to children began with their launch of a mid day meal programme in primary schools in the 1962–63 school year. Tamil Nadu is a pioneer in introducing mid day meal programmes in India to increase the number of kids coming to school; Thiru K. Kamaraj, then Chief Minister of Tamil Nadu, introduced it first in Chennai and later extended it to all districts of Tamil Nadu.
- During 1982, July 1st onwards, the Chief Minister of Tamil Nadu, Thiru. M. G. Ramachandran upgraded the existing Mid-day meal scheme in the state to 'Nutritious food scheme' keeping in the mind that 68 lakh children suffer malnutrition.

- Gujarat was the second state to introduce an MDM scheme in 1984, but it was later discontinued.
- A midday meal scheme was introduced in Kerala in 1984, and was gradually expanded to include more schools and grades. By 1990–91, twelve states were funding the scheme to all or most of the students in their area: Goa, Gujarat, Kerala, Madhya Pradesh, Maharashtra,

Meghalaya, Mizoram, Nagaland, Sikkim, Tamil Nadu, Tripura and Uttar Pradesh, Karnataka, Orissa, and West Bengal received international aid to help with implementation of the programme, and in Andhra Pradesh and Rajasthan the programme was funded entirely using foreign aid.

- In Karnataka, Children's LoveCastles Trust started to provide mid-day meals in 1997. A total of eight schools were adopted and a food bank programme and an Angganwasi milk Programme were started. The food-bank programme was replaced by the State Government midday meal scheme.

ENTITLEMENTS:

The nutritional guidelines for the minimum amount of food and calorie content per child per day are:

ENTITLEMENT NORM PER CHILD PER DAY UNDER MDM:

Item	**Primary (class one to five)**	**Upper primary (class six to eight)**
Calories	450	700
Protein (in grams)	12	20
Rice / wheat (in grams)	100	150
Rice / wheat (in grams)	100	150
Dal (in grams)	20	30
Vegetables (in grams)	50	75
Oil and fat (in grams)	5	7.5

In the case of micronutrients (vitamin A, iron, and folate) tablets and de-worming medicines, the student is entitled to receive the amount provided for in the school health

programme of

the National Rural Health Mission.

MONITORING AND EVALUATION:

Committees to monitor the MDM Programme

Level	Committee	Frequency of meeting
National	The national level steering / monitoring committee Program Approval Board (PAB)	Quarterly
State	The state level steering / monitoring committee	Quarterly
District	The district level committee	Monthly
Municipal	The municipal committee	Monthly
Block	The Mandal level committee	Fortnightly
Village	Panchayat level sub-committee	Day-to-day functioning of the implementing of the scheme
School	School management and development committee or Parent Teacher Association.	Monthly and as when it is required

The government of India Review Missions on Mid Day Meal Scheme, comprising members from the central government, state governments, UNICEF, and the office of the Supreme Court commissioner was created in 2010 to review the programme and offer suggestions for improvement. The scheme is independently monitored twice a year.

UNICEF:

- Stands for United Nations International Children's Emergency Fund
- Created on December 11, 1946 by the UN General Assembly as a temporary organization
- Established in 1946 with headquarter at New York.
- South East Asia region covers India.
- Initial goal was to provide emergency food and healthcare to children in countries that had been devastated by World War II.

- Today, UNICEF believes that the survival, protection and development of children must be a global priority, and that every child has the right to health, education, equality and protection.

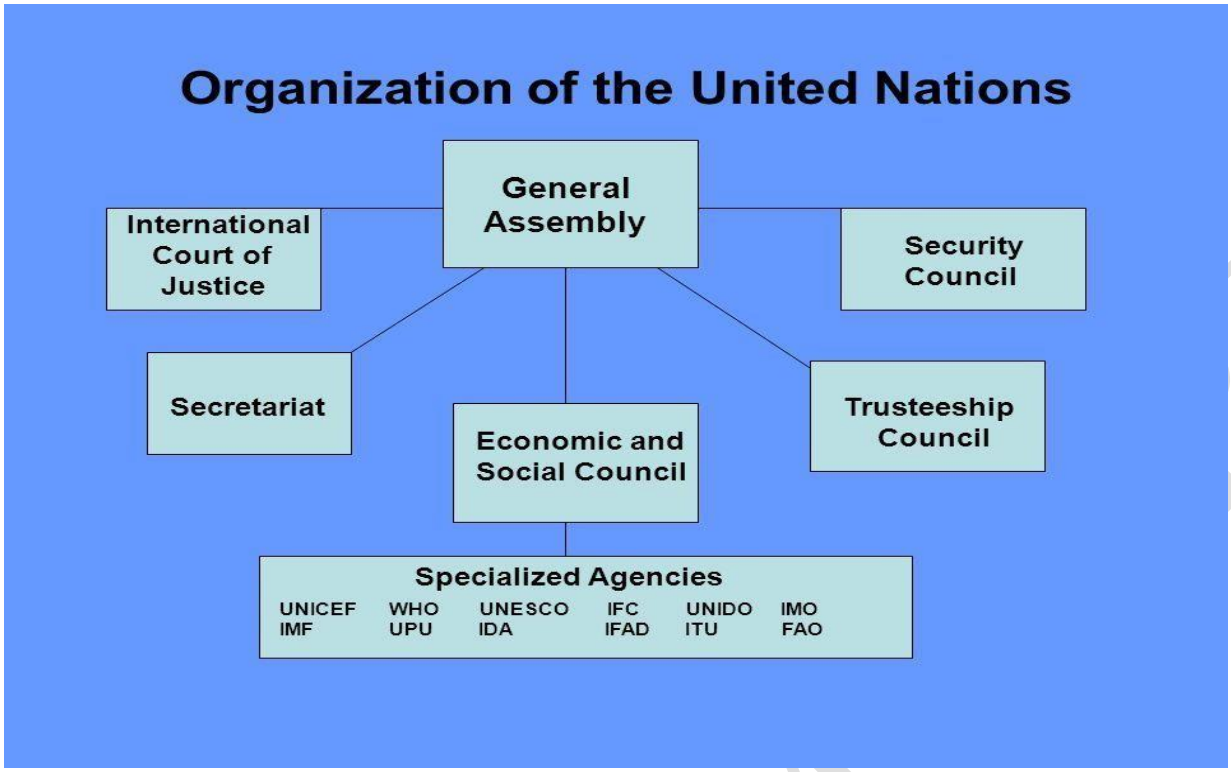
FUNCTIONS OF UNICEF:

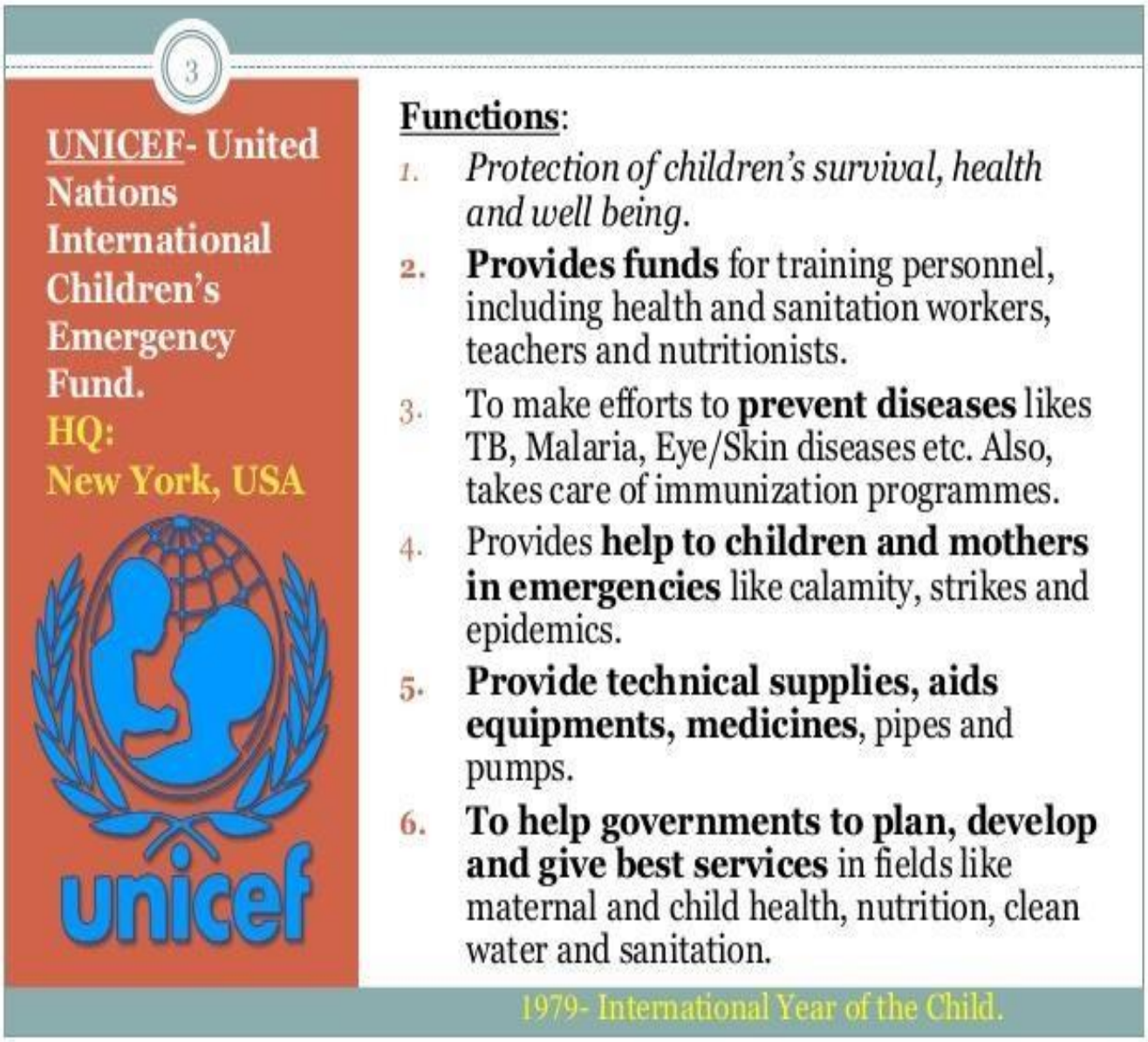
1. CHILD HEALTH:

- UNICEF has provided substantial aid for the production of vaccines and sera in many countries.
- UNICEF has supported India's BCG vaccination programme from its inception.
- UNICEF has also assisted environmental sanitation programmes emphasizing safe and sufficient water for drinking and household use in rural areas.
- The purpose is not only to reduce child illness and death, but to improve the quality of life in the villages.
- It also is focusing attention on providing primary health care to mothers and children, emphasis immunization, family planning, safe water and sanitation.

2. CHILD NUTRITION:

- UNICEF gives high priority to improving child nutrition.
- Its aid for child nutrition such as low cost protein rich food mixtures
- The UNICEF has supplied equipment roe modern dairy plant in various part of India, viz, Maharashtra, Gujarat, Karnataka, Uttar Pradesh, West Bengal, Andhra Pradesh.


Organization of the United Nations
General Assembly
International Court of Justice
Security Council
Secretariat
Economic and Social Council
Trusteeship Council
Specialized Agencies
UNICEF
WHO
UNESCO
IFC
UNIDO
IMO
IMF
UPU
IDA
IFAD
ITU
FAO



UN OFFICES:

UNICEF – Un International Children's Emergency Fund

WHO – World Health Organization

FAO – Food and Agricultural Organization

UNIDO – UN Industrial Development Organization

ILO – International Labor Organization

UNESCO – UN Educational, Scientific and Cultural Organization

UNDP – UN Development Program

ICAO – international Civil Aviation Organization

ITU – International Telecommunications Union

UNICEF'S ROLE:

UNICEF began its mission in 1946 as a relief organization for children after World War II. Its mandate soon expanded to helping children whose lives were at risk in developing countries.

Almost 60 years later, UNICEF is more than 7,000 people in 157 countries and territories around the world. Nine of 10 staff members work closely with national and local governments and other partners around the world.

This work correlates closely with the Millennium Development Goals set by United Nations States in 2000 – and is central to meeting them. Of the 48 indicators of progress toward the Goals, UNICEF is chiefly responsible for progress in 13.

What is the main purpose of the Unicef?

According to its mission statement, '**UNICEF** is mandated by the United Nations General Assembly to advocate for the protection of children's rights, to help meet their basic needs, and to expand their opportunities to reach their full potential.'

How many countries are involved in the Unicef?

Most of UNICEF's work is in the field, with staff in over **190 countries** and territories. More than 200 country offices carry out UNICEF's mission through programs developed with host governments.

What is the aim of the Unicef?

UNICEF is mandated by the United Nations General Assembly to advocate for the **protection** of children's rights, to help meet their basic needs and to expand their **opportunities** to reach their full **potential**.

UNICEF began its mission in 1946 as a relief **organization** for children after World War II. Its mandate soon expanded to helping children whose lives were at risk in developing countries Of the 48 indicators of progress toward the Goals, **UNICEF** is chiefly

responsible for progress in 13.

YOUNG CHILD SURVIVAL AND DEVELOPMENT:

In support of Millennium Goal 4 – reducing child mortality – and Goal 6, malaria control, among others, UNICEF works toward comprehensive child health care in the earliest years, includes the antenatal period before birth.

Health programmes ideally include antenatal care of pregnant women and neonatal care in the first four weeks after birth, including promoting breastfeeding. UNICEF also shares advocacy, social mobilization, and research work in a supporting role to help other agencies provide emergency obstetrics.

UNICEF is also often first on the ground in declared emergencies to deliver these and other life- saving interventions, like fresh water and basic medical supplies.

Along with the World Health Organization (WHO), UNICEF supports local programmes that improve access to basic water and sanitation, which are in turn vital for health, development and education initiatives.

BASIC EDUCATION AND GENDER EQUALITY:

In support of MDG 2 and 3, UNICEF collaborates with countries, donor governments and other UN agencies to promote, fund and facilitate universal primary education and gender equality.

This includes improving children's developmental readiness for school, especially for excluded children and among disadvantaged groups, via community-sponsored childhood education and health initiatives.

Finally, UNICEF also delivers school supplies and tents in emergencies as part of its Back-to- School programme, helping children return to a more normal, safe environment and protecting their right to basic education.

HIV/AIDS AND CHILDREN:

This disease crisis brings poverty and social devastation along with death. To combat it – which helps reach MDG 6 -- UNICEF works with nations, non-profit organizations and religious groups, youth organizations and many other partners to organize gender-sensitive prevention education, skills and service campaigns aimed particularly at adolescents.

UNICEF also works via advocacy and community outreach to help governments, communities

and families support children orphaned by HIV/AIDS.

UNICEF also supports programmes that help prevent mother-to-child transmission of HIV/AIDS and that increase the number and proportion of women and children receiving antiretroviral drugs.

CHILD PROTECTION:

In support of Millennium Summit Declaration Section 6 – Protecting the Vulnerable UNICEF advances protective environments to help prevent and respond to violence, exploitation, abuse and discrimination, and for children made vulnerable by emergencies. Focus areas include raising government awareness of child protection rights and situation analysis, as well as promoting laws that punish child exploiters. Working through advocacy and its local offices worldwide, UNICEF helps strengthen the resources of schools, communities and families to care for marginalized children, including those orphaned by HIV/AIDS.

PROGRESS AND CHALLENGES:

World is behind schedule for meeting almost all of the Goals. And the consequences will be suffered most by children. Millions will die or sicken from preventable diseases. Millions will see their futures dim because their governments have not provided them with basic education. Experts agree, however, that meeting the Millennium Goals is achievable by 2015. Reaching them will require a stronger commitment and focus from all countries on realizing the rights of children, and therefore toward achieving global development and peace.

FAO:

- The Food and Agriculture Organization of the United is a specialized agency of the United Nations that leads international efforts to defeat hunger. Serving both developed and developing countries, FAO acts as a neutral forum where all nations meet as equals to negotiate arguments and debate policy.
- FAO is also a source of knowledge and information, and helps developing countries in transition modernize and improve agriculture, forestry and fisheries practices, ensuring good nutrition and food security for all.
- Its Latin motto, *fiat panis*, translates as "let there be bread". As of May 2017, FAO has 194 member states, along with the European Union (a "member organization"), and the Faroe Islands and Tokelau, which are associate members.
- The Food and Agriculture Organization of the United Nations (FAO) is a specialized

agency of the United Nations that leads international efforts to defeat hunger.

- It serves both developed and developing countries and acts as a neutral forum where all nations meet as equals.

- FAO is also a source of knowledge and information, and helps developing countries and countries in transition modernize and improve agriculture, forestry and fisheries practices, ensuring good nutrition and food security for all.
- DEFINITION of 'Food And Agriculture Organization - FAO' A United Nations agency that works on international efforts to defeat hunger by helping developing countries modernize and improve agriculture, forestry and fisheries practices.

MAIN OBJECTIVE OF THE FAO:

- Achieving FAO's goals to end hunger and poverty is a challenging and complex task. Today, thanks to major changes in how we do business, FAO is a fitter, flatter and more flexible organization, whose activities are driven by five strategic objectives.

THE FUNCTIONS OF FAO:

- The Organization collects analyses and disseminates information; advises governments on policy and planning; serves as an international forum for discussing food and agricultural issues, and approving international standards and agreements; and provides direct aid for development.
- It also intervenes in times of crisis when food production and distribution are disrupted by human or natural disasters such as war, drought and insect infestations.
- FAO plays a key role in supporting governments, producers, traders and other stakeholders to move towards the responsible use of antimicrobials in agriculture, thus helping reduce antimicrobial resistance in agricultural systems.

WHO:

The World Health Organization (WHO) is the body of the United Nations (UN) responsible for directing and coordinating health. As such WHO has come to play a vital role as an actor in the field of international public health and international public health policy.

What are the main functions of the World Health Organization? How effectively has it

performed these functions when dealing with maternal health?

- The World Health Organization (WHO) is the body of the United Nations (UN) responsible for directing and coordinating health. As such WHO has come to play a vital role as an actor in the field of international public health and international public health policy.

- Since its inception in 1947 WHO has been at the forefront of many breakthroughs in the field including, most notably, what has come to be described as one of the greatest humanitarian achievements of the 20th century, the elimination of Smallpox in 1979.
- However WHO's inability to control the spread of HIV/AIDS, particularly in Africa has cast doubt on its effectiveness.
- Though much of the media attention given to WHO concentrates on its role in controlling and ultimately eliminating infectious disease, WHO's mandate is far broader.
- The details of WHO's mandate will be examined in detail throughout this paper but put simply this mandate is to ensure the attainment of the highest possible level of all forms of health by all human beings.
- This paper will focus on the area of maternal health. Maternal health is an important indicator, alongside life expectancy, of development.
- This is reflected by the inclusion of maternal health in the Millennium Development Goals (MDGs) however the area of maternal health is often ignored by international relations (IR) scholars who tend to focus analysis of WHO on its role in dealing with infectious disease.
- This focus on infectious disease by IR scholars is understandable in light of globalization.
- Due to globalization and the related transport revolution of the 20th century it is now possible for infectious diseases to spread around the globe in a matter of days.
- The threat of infectious disease brings with it a number of traditional, hard security issues that put bluntly other health issues do not.
- However in light of the development of the human security paradigm from the late 1990s onwards it is now becoming increasingly apparent that IR scholars will need to expand their examination of the ways in which WHO functions beyond the realm of infectious disease.

THE ROLE OF "WHO" IN PUBLIC HEALTH:

- Providing leadership on matters critical to health and engaging in partnerships

where joint action is needed.

- Shaping the research agenda and stimulating the generation, translation and dissemination of valuable knowledge.
- Setting norms and standards and promoting and monitoring their implementation.
- Articulating ethical and evidence based policy options.

- Providing technical support
- Monitoring the health situation and assessing health trends.
- High – level advocacy and awareness rising on matters critical to health.

FUNCTIONS OF "WHO":

First Constitutional Function is to act as the directing and coordinating authority in all International health work.

- Prevention and control of specific diseases.
- Development of comprehensive health services.
- Family health.
- Environmental health.
- Health statistics.
- Biomedical research.
- Health literature and information.
- Cooperation with other organizations.

What are the main objectives of the WHO?

The main objectives of World Health Day 2005 are to: Raise awareness of the extent of illness, suffering and death among mothers and children, and its impact on health as well as social and economic development. Increase understanding that solutions exist.

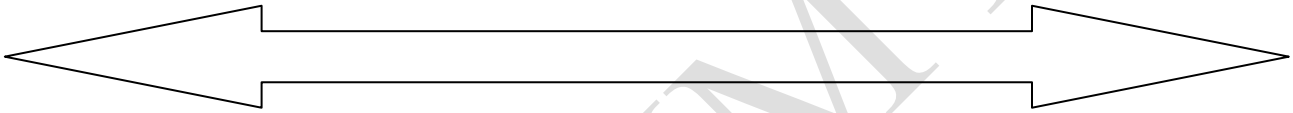
What is the purpose of the WHO?

The World Health Organization is a group that focuses on global health issues. This lesson will cover its start at the United Nations, its purpose and progress so far, and its challenges in today's world.

THE ROLE OF "WHO" IN IMPROVING SUSTAINABLE HD:

- WHO's programs also work to promote and improve sustainable HD by providing people with more opportunities, access to education, healthcare, food etc.
- People can earn an income and therefore have access to the above essential resources.

- All of which then improve SHD through:
  - An improved standard of living,
  - People being able to lead more productive lives,
  - People being able to participate in their community,
  - And people meeting their needs without compromising opportunities for future generations.



UNIT – V

PAMPLETS ON NUTRITION PREPARATION

Pamplets on Nutrition Education Definition, need, principles and methods of nutrition education.

NUTRITION EDUCATION:

It is any combination of educational strategies, accompanied by environmental supports, designed to facilitate voluntary adoption of food choices and other food- and nutrition-related behaviors conducive to health and well-being. Nutrition education is delivered through multiple venues and involves activities at the individual, community, and policy levels.

This definition has been adopted by the Society for Nutrition Education and Behavior and was authored by Dr. Isobel Contento. The work of nutrition educators takes place in colleges, universities and schools, government agencies, cooperative extension, communications and public relations firms, the food industry, voluntary and service organizations and with other reliable places of nutrition and health education information. Nutrition education is a mechanism to enhance awareness, as a means to self-efficacy, surrounding the trigger of healthy behaviors.

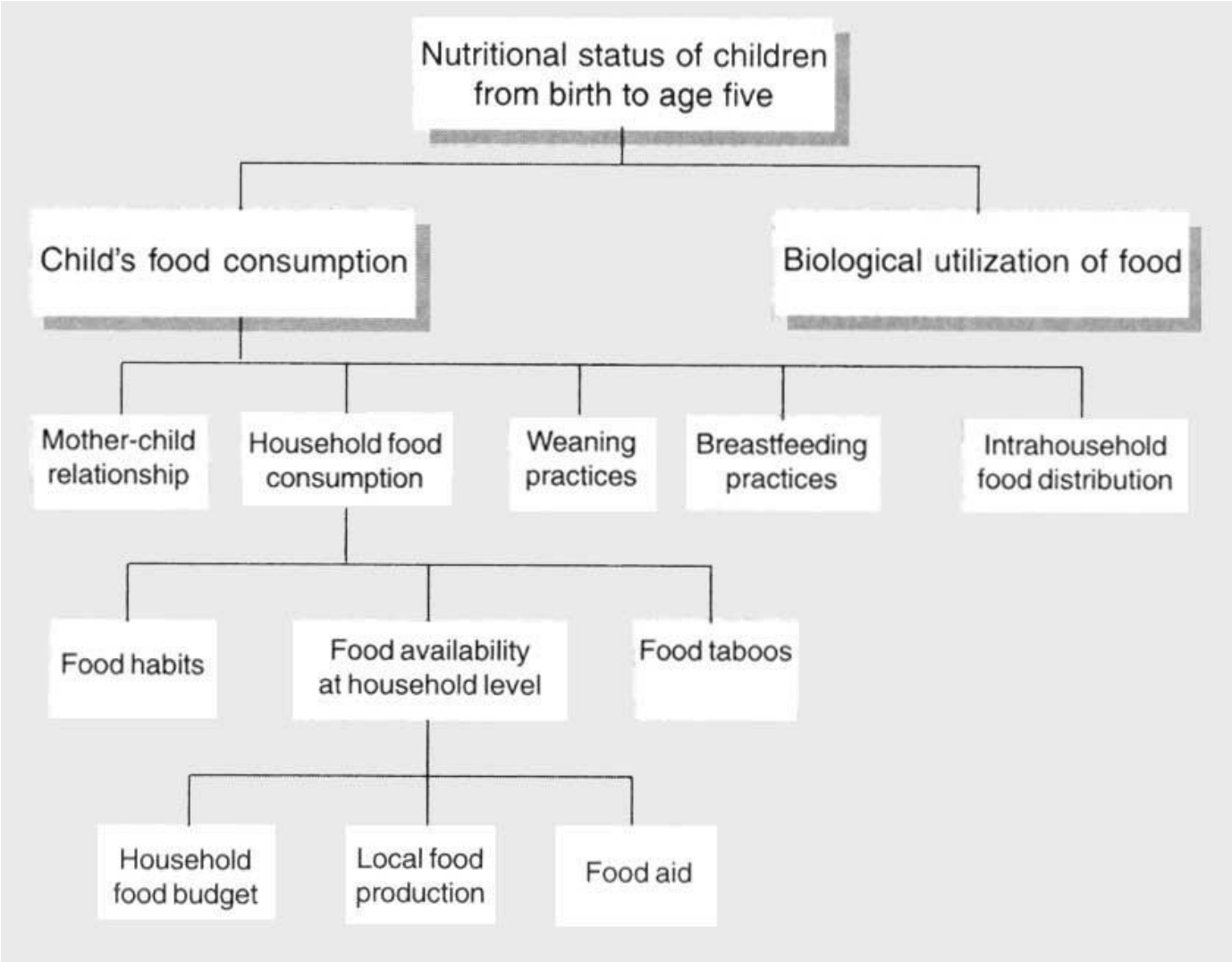
CHARACTERISTICS OF SUCCESSFUL NUTRITION EDUCATION INTERVENTIONS:

- Intensive interventions with multiple components of nutrition education.
- Tailored intervention (s) to an individual rather than just nutrition education by self.
- Formal rather than informal nutrition education format.
- Combination of education activities reinforced in multiple venues.
- Connection to community environment factors that influence obesity.

PROVIDING NUTRITION EDUCATION:

- One form of nutrition intervention (as defined by the Academy)
- Help client support care by self-managing their diet.

- Enable client to make better food choices (make decisions)
- Positive lifestyle and behaviour changes
- Extensive client involvement



AIMS OF NUTRITION EDUCATION:

To increase people's ability to know the following facts:

The relationship between the body growth, qualities of and appearance, and the types of food they eat.

Increased diversification in the food they eat, and enjoy its

taste. Planning and preparing of meals rich in nutrients.

The natural resoures of food.

Assessment of their nutritional behaviors and beliefs.

Appreciating the importance of the standard of living and improving programs.

PRINCIPLES OF NUTRITION EDUCATION:

Nutrition education is an instructional method that promotes healthy behavior by imparting information, which individuals can use to make informed decisions about food, dietary habits, and health.

DEVELOPING A NUTRITION EDUCATION PLAN:

The plan describes the needs of the target population, goals and objectives for the intervention activities, the programme format, the lesson plans (e.g. handouts, videos, etc), the nutrition messages to be imparted to the target population, the marketing plan, any partnerships that will support the programme development or delivery, and the evaluation of instruments.

The table below shows activities related to developing a nutrition education plan Target group

Activity	Individuals	Communities	Systems
Assess needs			
Set goals & objectives			
Specify the format			
Develop a lesson plan			
Specify nutritional messages			
Choose programme identifiers			
Develop a marketing plan			
Specify partnership			
Conduct an evaluation research			

- Information can be obtained by reviewing the data obtained during the community needs assessment and by conducting formative evaluation research.
- The format might consist of three didactic lectures, six lectures and two cooking demonstrations, or it might involve three individual counselling sessions and 10 group sessions.

The programme will consist of 90 minutes sessions which participants will have an opportunity to set target dietary goals, try new behaviours, and assess their success. The sessions will be organised as follows (e.g. based on risks of cardio - vascular disease):

1. Getting started
2. Looking for fat in all the right places
3. Cooking meat the low-fat way
4. Dairy goes low-fat
5. Focus on fruits & vegetables
6. Reading food labels
7. Grocery shopping make easy
8. Reading restaurant menus.

If format calls for individual counseling, facility must have private rooms for this activity. If the format calls for the formation of small groups, conference rooms or classrooms for teaching groups should be provided.
If there cooking demonstrations are included, in the format, you should have counters, sinks, electrical outlets, and other equipment.

DEVELOP LESSON PLANS:

The community nutritionist considers the instructional method: group sessions, one-to-one counselling, best suited for teaching. A programme consisting mainly of group sessions is more likely to fit within the budget, because group sessions tend to be less costly than individual counselling. The community nutritionist should decide whether to develop your own nutrition education material, use existing materials, or do both. To save time, you should review existing programmes and their nutrition education materials to determine whether they can be used with or adapted for a particular population.

Case – study: An example of lesson plans for two sessions of the "heart works for women" programme.

Session	Title	Session objectives	Instructional materials	Learning activities	Nutrition message
1.	Getting started	At the end of the session, participants will be able to: • Describe the programme's two goals & four objectives • Describe five major risk factors for CHD	• Information form • Description of course goals, and objectives • Handout of risk factors for heart disease • Handout "Recipe for summer salsa and baked sweet potato chips • Brochure "Get the facts about heart health"	• CHD & nutrition knowledge pre-test • Handout "Am I ready to change ?" • Taste test of summer salsa and baked chips	• Diets high in fat & saturated fat raise blood total cholesterol • High blood cholesterol levels are a risk factor for CHD • Low – fat cooking is easy

2.	Looking for fat in all the right places	• Define four types of dietary fats • Describe major food sources of dietary fat • Describe the major sources of fat in the typical target population's diet	• Handout: "Definitions of fats" • Handout: "Dietary fats chart" • Handout" Goal sheet"	• Dietary fats quiz • Completion of goal sheet: reducing fat intake.	Choose low-fat foods more often than high-fat foods.

SPECIFY THE NUTRITION MESSAGES:

- Messages should be specified for each lesson plan
- Messages should convey a simple, easy – to – understand concept related to the lesson goals and objectives

CHOOSE PROGRAMME IDENTIFIERS:

These include: name, logo, an action figure or a tag line (which is a short, simple message that conveys a key intervention message and is used on promotional materials, e.g. "Good food for good health"

DEVELOP A MARKETING PLAN:

"If you don't exist in the media, for all practical purposes you don't exist (Schorr, quoted by Boyle and Morris (1999 p. 268). Thus, the community nutritionist should also use the media to make known what she/ he intends to do in and with the target population.

SPECIFY PARTNERSHIPS:

The nutritionist should network with national food companies to obtain complementary nutrition education materials for the course. Form partnerships with grocery stores, retail establishments, government agencies, nongovernmental organisations, etc…to control the cost and increase the reach of the programme.

CONDUCT A FORMATIVE EVALUATION:

For example, invite members of target population to review materials to be used in the programme for reading level and understanding. The target population helps determine whether the materials are appropriate & useful.

DESIGNING NUTRITION AND HEALTH MESSAGES:

How can nutrition messages be formulated to influence consumer behaviour is the

important question. The following are general ideas for designing messages:

- Present information in a novel or unusual fashion. E.g. putting a logo (on T-shirts, golfshirts, jackets), pens, and magnetic memo boards. No matter what the medium, the message, the message reaches consumers in unexpected ways.
- Use a language that says to consumers: "listen to this, it is important"
- Ask questions such as "how many listeners know the number of women who die from heart attacks every year?" if we use the example of CHDs
- Think about the target population & consider the style & format of messages that will get their attention – children, teenagers, or adults.

Summary on effective communications from the American Dietary Guidelines Alliance:

- Give it to me straight – use simple, straightforward language. Don't use scientific jargon
- Make it simple & fun – make it clear that eating healthful diets and being physically active are not time consuming, complicated chores. Emphasise on improving habits, not trying to achieve perfection.
- Explain "what is in it for me" – make the benefits of healthy lifestyle clear. Use out comes to motivate consumers for change.
- Stop changing your minds – be consistent in making recommendations

IMPLEMENTING THE PROGRAMME:

The goal of this phase of the planning process is to deliver as faithfully as possible the programme laid out in the nutrition education plan. A record should be made of any unexpected problems so that a strategy for preventing them can be developed for future programmes.

ENHANCE PROGRAMME PARTICIPATION:

Participation refers to the number of people who take part in a health promotion activity and these are steps to follow:

1. Understand the target population & their needs and interests
2. Use evaluation research to improve the programme design
    - Make the activity enjoyable and relevant to the target population's needs.

- Remove barriers to participation
- Remember, people participate in health promotion activities for different reasons:

- To have fun
- Be with friends or family
- Learn something new
- Be challenged
- Fulfill a goal, or
- Seek support

Find ways to help the target population see the immediate benefits of participating.

3. Use incentives e.g. T-shirts, cookbooks
4. Build ownership of the programme among participants by using slogans, action figures, and logos to enhance the programme's identity.
5. Finally, promote, promote, promote, i.e. make the programme highly visible for the target population.

CONDUCTING A SUMMATIVE EVALUATION:

This is a research conducted at the end of a programme that helps determine whether the programme was effective and how it might be improved on:

- Instructional materials
- Programme activities
- Physical arrangements (location, room temperatures, parking space, etc…)
- Registration procedures,

Participants are asked to rate these programme elements. The data obtained from a summative evaluation is used to improve the programme's delivery and effectiveness & make the programme an inviting place for learning.

MARKETING NUTRITON FOR HEALTH PROMOTION & DISEASE PREVENTION:

Marketing is the process by which individuals and groups get what they need and want by creating and exchanging products and values with others. In line with the community nutrition and assessment, we carry out social marketing, which is more or

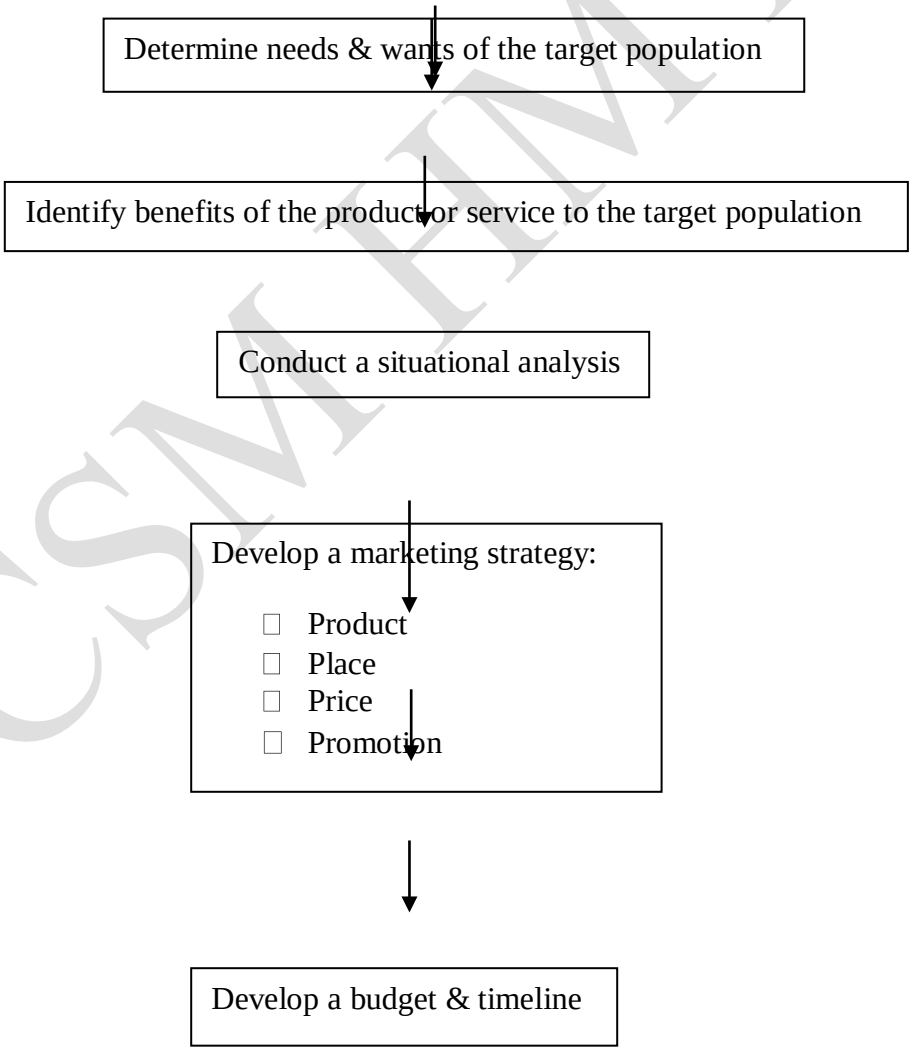
less like the commercial marketing defined above.

The social marketing consists of the design, implementation, and management of programmes that seek to increase the acceptability of a social idea or practice among a target population.

The purpose of marketing is to find a problem, need or want (through marketing research) and to fashion a solution to it, which should be outlined in the marketing plan.

MARKETING PLAN:

It describes precisely how and in what form the nutrition & health messages will be delivered to the target population. The chart below shows steps in a developing marketing plan.

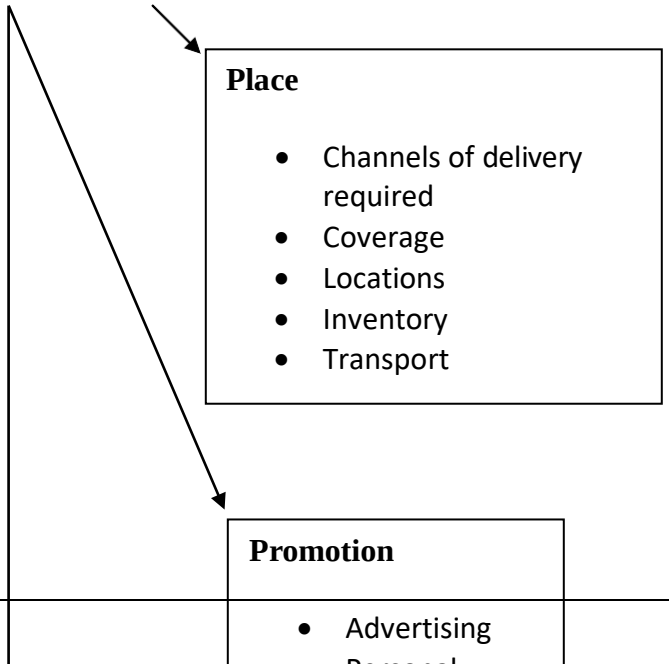


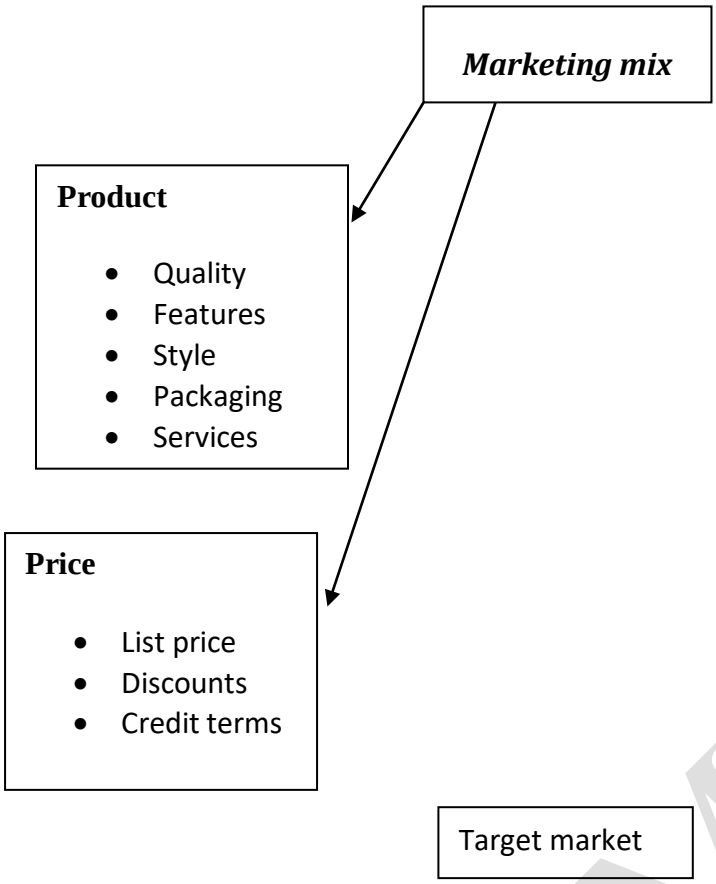
Implement the marketing strategy

Evaluate the marketing plan- use SWOT: Strengths, weaknesses, opportunities, and threats

Determine the needs & wants of target population:

- Some ideas about needs & wants can be gleaned from the community needs assessment and from focus group session held earlier in the programme planning process. Asking questions of the target population can collect additional information.
- Specify the benefits of the product or service to the target population or service to the target population. People want intangible things when they buy a product or service: safety, security, happiness, attractiveness, and fun.
- Conduct a situational analysis – analyse your potential market – select a target market, which will be the primary, distinct customer group for your product, programme, or service (Target market = one particular market segment pinpointed as a primary customer group).
- Develop a marketing strategy for ensuring a good fit between the goals and resources of the organisation and the needs and wants of the target population. The marketing strategy specifies a target market and four distinct elements traditionally known as the four Ps: product, place, price, & promotion, which are referred to as the marketing mix (refers to a universal elements of marketing that are often called the "four Ps" – product encompasses the range of services offered; price encompasses the monetary and intangible value of the product; place refers to where the product is available; promotion is persuasive communication aimed at target users.)




Marketing mix
Product
Quality
Features
Style
Packaging
Services
Price
List price
Discounts
Credit terms
Target market

Please note:

- Advertising means any paid form of non-personal presentation & promotion of ideas, goods, or services by an identified sponsor
- Promotion has four general objectives: to inform & educate consumers about the existence of a product or service and its capabilities; to remind present & formers users of the product's continuing existence; persuade prospective purchasers that the product is worth buying; to inform consumers about where and how to abstain & use the product (accessibility, location, and time).
- The four most common promotional tools are advertising, sales promotion; communication / personal selling, and publicity.
    - Sales promotions are short-term incentives to encourage purchases or sales of a product or service.
    - Personal selling / communication involves oral presentation in c conversation with one or more prospective purchasers for the purpose of making sales or building goodwill
    - Publicity refers to nonpersonal stimulation of demand for a product, service or business unit by planting commercial significant news about it in a published medium or obtaining favourable presentation of it on radio, television, or stage that is not paid for by the sponsor.

An example of a marketing mix can be "heartworks for women" programme to prevent coronary heart diseases among women.

Product	Place	Price	Promotion

"Heartworks for women" programme	• Worksites • Universities/ colleges • Local private health and fitness clubs	Each course will cost $ 1 million / participant	• Flyers, brochures, posters • Internet • Campus, company bulletin boards • Press releases • Newspapers • Mother / daughter walk.