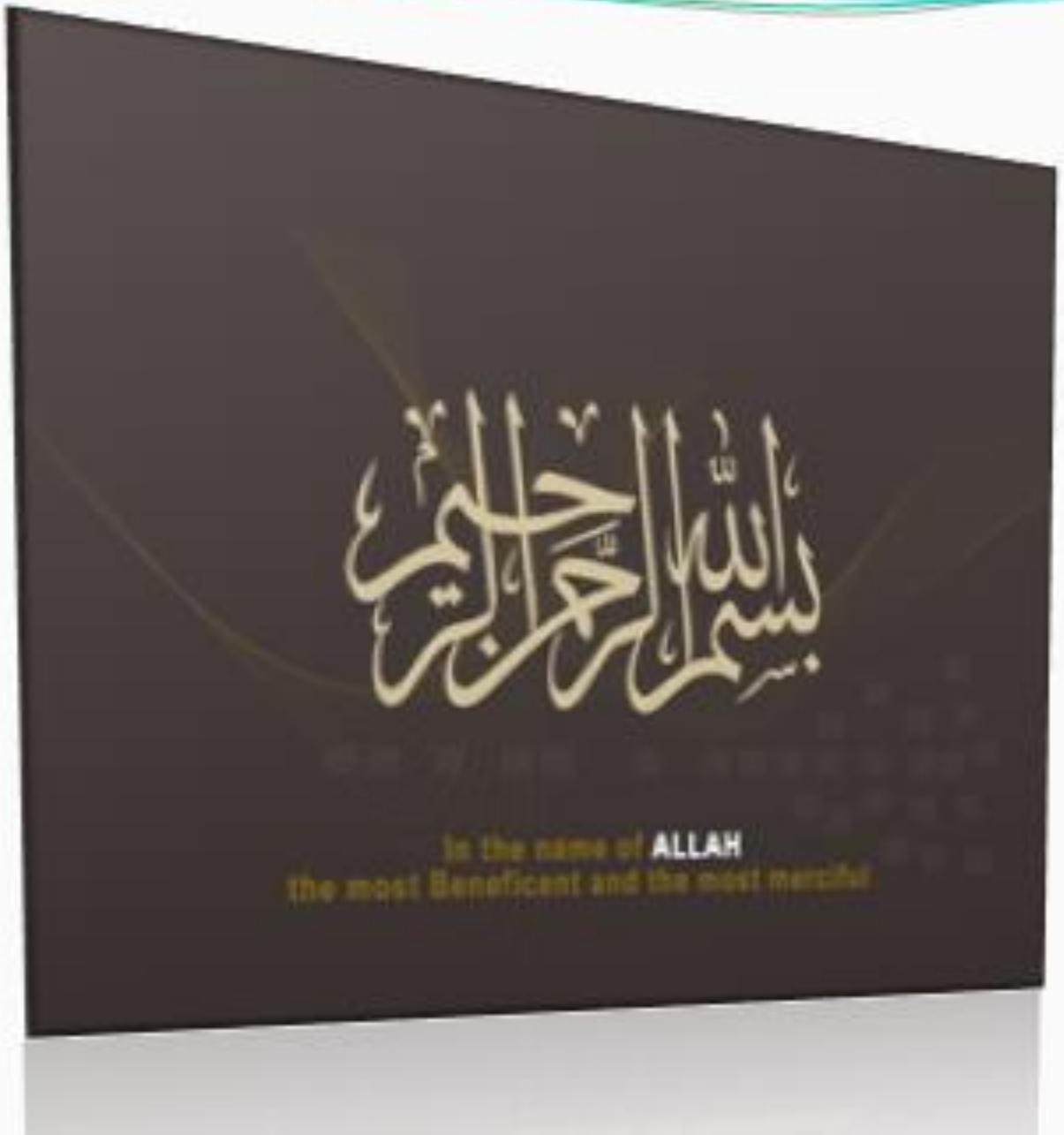
بسم الله الرحمن الرحيم
In the name of ALLAH
the most Beneficent and the most merciful

NUTRITION AND HEALTH-9

FOOD SAFETY

FOOD SAFETY/FOOD HYGIENE

- WHO has defined 'food Safety' as:

" all conditions and measures that are necessary during the production, processing, storage, distribution, preparation and presentation of food to ensure that it is safe, sound, wholesome and fit for human consumption"

FOOD SAFETY/FOOD HYGIENE

- Food is a potential source of infection and is liable to contamination by microorganisms, at any point during its journey from the producer to the consumer.

FOOD SAFETY/FOOD HYGIENE

- Food hygiene implies hygiene in the production, handling, distribution and serving of all types of food.
- The primary aim of food hygiene is to prevent food poisoning and other food-borne diseases

MILK HYGIENE

- Milk is an efficient vehicle for a great variety of disease agents. The source of infection or contamination of milk may be:

1) The dairy animal
2) Human handler
3) The environment e.g. contaminated vessels, polluted water, flies, dust etc.

MILK HYGIENE

- MILK-BORNE DISEASES

1) Infections of animals that can be transmitted to man: Tuberculosis, Brucellosis, Streptococcal infections, Staphylococcal enterotoxin poisoning, salmonellosis, Q fever, Cow-pox, Foot & mouth disease, Anthrax, Leptospirosis, Tick-borne encephalitis

MILK HYGIENE

- (MILK-BORNE DISEASES)

2) Infections primary to man that can be transmitted through milk: Typhoid & paratyphoid fevers, Shigellosis, Cholera, Diphtheria, Tuberculosis, Viral hepatitis, Enteroviruses, Streptococcal infections, Staphylococcal food poisoning

MILK HYGIENE

- The safety and keeping quality of milk are related to its microbial content. The essentials in production of clean and safe milk are:

- Healthy and clean animal
- Sanitary premises for animals
- Sterile and covered vessels

MILK HYGIENE

- Safe water supply
- Healthy milk handlers
- Use of milking machines, where possible
- Immediate cooling of milk to below 10°C
- Cleanliness of all containers & equipment used for storage and transport

PASTEURIZATION OF MILK

- Pasteurization may be defined as the heating of milk to such temperatures and for such period of time as are required to destroy any pathogens that may be present while causing minimal changes in the composition, flavor and nutritive value

PASTEURIZATION OF MILK

- Pasteurization is a preventive measure of public health importance, and correspond in all respects to the modern principles of supplying safe milk.

PASTEURIZATION OF MILK

- It kills nearly 90% of bacteria in milk including tubercle bacillus, but it does not kill thermoduric bacteria and bacterial spores. In order to check the growth of microorganisms, such milk should be kept cool below 4°C until it reaches the consumer

PASTEURIZATION METHODS

- There are several methods of pasteurization e.g.

1) Holder (Vat) Method
2) HTST Method (High Temperature and Short Time Method)
3) UHT Method (Ultra High Temperature Method)

PASTEURIZATION METHODS

- Holder (Vat) Method: In this process milk is heated and kept at 63-66°C for at least 30 minutes, and then quickly cooled to 5°C. This method is recommended for small and rural communities. In larger cities it is going out of use

PASTEURIZATION METHODS

- HTST Method: In this process milk is rapidly heated to a temperature of nearly 72°C, is held at that temperature for not less than 15 seconds, and then is rapidly cooled to 4°C. This is now the most widely used method. Very large quantities of milk per hour can be pasteurized by this method

PASTEURIZATION METHODS

- UHT Method: In this process milk is rapidly heated, usually in two stages (second stage under pressure) to a temperature of 125°C for a few seconds only. It is then rapidly cooled to 4°C and bottled as quickly as possible

MEAT HYGIENE

- The term ‘meat’ includes various tissues of animal origin. The diseases which may be transmitted by eating unwholesome meat are:

MEAT HYGIENE

1) TAPE WORM INFESTATIONS:- Tinea solium, Tenea saginata, Trichinella spiralis and Fasciola hepatica
2) BACTERIAL INFECTIONS:- Anthrax, actinomycosis, tuberculosis and food poisoning

MEAT HYGIENE

- Animals intended for slaughter are subjected to proper antemortem and postmortem inspection by qualified veterinary staff.

MEAT HYGIENE

- The principal causes of antemortem rejection of animals are: emaciation, exhaustion, pregnancy, sheep-pox, foot-rot, actinomycosis, tuberculosis, brucellosis, febrile conditions, diarrhoea and other infections rendering meat unfit for human consumption

MEAT HYGIENE

- The main causes of postmortem rejection of animals are: cysticercus bovis, liver fluke, abscesses, hydatidosis, septicaemia, parasitic and nodular infections of liver and lungs, tuberculosis etc.

MEAT HYGIENE

- The characteristics of good meat are that it should have neither pale pink nor a deep purple tint. It should be firm and elastic to touch and have an agreeable odour

MEAT HYGIENE

- SLAUGHTER HOUSES: These are the places where animals, whose flesh is intended for human consumption, are slaughtered. The hygiene of slaughter houses is of paramount importance to prevent the contamination of meat during the process of dressing.

MEAT HYGIENE

The following minimum standards for slaughter houses have been suggested:

1) **Location:** Preferably away from residential areas
2) **Structure:** Floors and walls upto 3 feet should be impervious and easy to clean
3) **Disposal of wastes:** Blood, offal etc. should be disposed off properly

MEAT HYGIENE

(SLAUGHTER HOUSES)

4. **Water supply:** It should be independent, adequate and continuous
5. **Examination of animals:** ante mortem and postmortem examination to be arranged. Animals or meat found unfit for human consumption should be destroyed.

MEAT HYGIENE

(SLAUGHTER HOUSES)

6) **Storage of meat:** Meat should be stored in fly-proof and rat-proof rooms; for overnight storage of meat, the temperature of the room shall be maintained below 5°C

7) **Transportation of meat:** Meat should be transported in fly-proof covered vans

FISH HYGIENE

- Fish deteriorates or loses its freshness because of autolysis which sets in after death and because of the bacteria with which these become infected

FISH HYGIENE

- The signs of fresh fish are:

1) It is in a state of stiffness
2) The gills are bright red
3) The eyes are clear and bright

FISH HYGIENE

- Fish is intermediate host of tape worm, which is communicable to man. Fish may carry and transmit various bacteria and viruses e.g. Salmonella species, Vibrio parahaemolyticus, Clostridium botulinum, Hepatitis A virus and other organisms. Consumption of certain type of fish may cause ‘fish poisoning’

EGG

- Although the majority of freshly laid eggs are sterile inside, the shells become contaminated by faecal matter from the hen. Microorganisms including pathogenic salmonella can penetrate a cracked shell and enter the egg

FRUITS AND VEGETABLES

- Fruits and vegetables constitute another important source for the spread of pathogenic organisms, protozoans and helminths. These infections are a serious menace to public health where sewage is used for growing vegetables

FRUITS AND VEGETABLES

- The vegetables which are consumed raw in the form of salads pose a problem in food sanitation. People should be educated to wash the vegetables before eating these raw. Vegetables which are cooked are free from this danger

FOOD HANDLERS

- Food sanitation rests directly upon the state of personal hygiene and habits of personnel working in the food establishments. Proper handling of foods, utensils and dishes together with emphasis upon the necessity for good personal hygiene are of great importance

FOOD HANDLERS

- The infections which are likely to be transmitted by food handlers are typhoid and paratyphoid fevers, diarrhoeas, dysenteries, enteroviruses, viral hepatitis, protozoal cysts, eggs of helminths, strepto and staphylococcal infections and salmonellosis

FOOD HANDLERS

- The first essential is to have complete medical examination carried out of all food handlers. Any person with H/O typhoid fever, diphtheria, chronic dysentery, tuberculosis or any other communicable disease should not be employed

FOOD HANDLERS

- Persons with wounds, otitis media or skin infections should not be permitted to handle food or utensils. The day to day health appraisal of the food handlers is also equally important; those who are ill should be excluded from food handling

FOOD HANDLERS

- Education of food handlers in matters of personal hygiene, food handling, utensils, dish washing, insect and rodent control is the best means of promoting food hygiene. Certain aspects of personal hygiene are required to be continually impressed upon them

FOOD HANDLERS

- Hands should be clean at all times. Hands should be scrubbed and washed with soap after visiting a lavatory and as often as necessary at other times. Finger nails should be trimmed and kept free from dirt
- Head coverings should be provided particularly in the case of females

FOOD HANDLERS

- Clean white overalls should be worn by all food handlers
- Coughing and sneezing in the vicinity of food, licking the fingers before picking an item of food and smoking on food premises are to be avoided

Food additives

- The concept of adding "non-food" substances to food products is not new. Pickling is an ancient culinary practice aimed at preserving food articles such as mango, lime, etc. for fairly long periods by the addition of salt and spices.

Food additives

- Modern science of food technology has revolutionized food processing with the introduction of chemical additives to increase the shelf-life of food, improve its taste, and

to change its texture or colour.

Food additives

- Majority of the processed foods such as bread, biscuits, cakes, sweets, confectionary, jams, jellies, soft drinks, ice creams, ketchup and refined oils contain food additives.

Food additives

- Food additives are defined as non-nutritious substances which are added intentionally to food, generally in small quantity, to improve its appearance, flavour, texture or storage properties

Food additives

- Food additives may be classified into two categories :
- Additives of the first category include
  - colouring agents (e.g., saffron, turmeric),
  - flavouring agents (e.g., vanilla essence),

Food additives

- sweeteners (e.g., saccharin),
- preservatives (e.g., sorbic acid, sodium benzoate),
- acidity imparting agents (e.g., citric acid, acetic acid), etc.

Food additives

- Additives of the second category are, strictly speaking,
  - contaminants incidental through packing,
  - processing steps,
  - farming practices (insecticides) or other environmental conditions

Food additives

- Any food that contains food additives that are not permitted is considered to be adulterated;
- if the permissible limit exceeds then also the food is considered adulterated.

Food additives

- The nature and quantity of the additive shall be clearly printed on the label to be affixed to the container. Whenever, any extraneous colouring matter has been added to any article of food, the words "Artificially Coloured" shall be written on the label.

Food additives

- At the international level, in 1963, a joint FAO/WHO programme on food standards was established, with the FAO/WHO Codex Alimentarius Commission as its principal organ. Protection of the health of consumers is the primary aim of the Commission.

Food additives

- The ultimate effects of food additives on man is an important problem of public health and is therefore of great concern to the public and the health administrators.

Food fortification

- WHO has defined "food fortification" as "the process whereby nutrients are added to foods (in relatively small quantities) to maintain or improve the quality of the diet of a group, a community, or a population."

Food fortification

- Fortification of food is a public health measure aimed at reinforcing the usual dietary intake of nutrients with additional supplies to prevent/control some nutritional disorders.

Food fortification

- Programmes of demonstrated effectiveness of fortification of food or water are :
  - fluoridation of water as a preventive of dental caries;
  - iodization of salt for combating the problem of endemic goitre, and

Food fortification

- food fortification (e.g., Vanaspati, milk) with vitamins A and D.

Food fortification

- In order to qualify as suitable for fortification, the vehicle and the nutrient must fulfil certain criteria
  - (a) the vehicle fortified must be consumed consistently as part of the regular daily diet by the relevant sections of the population or total population

Food fortification

- (b) the amount of nutrient added must provide an effective supplement for low consumers of the vehicle, without contributing a hazardous excess to high consumers;

Food fortification

- © the addition of the nutrient should not cause it to undergo any noticeable change in taste, smell, appearance, or consistency; and
- (d) the cost of fortification must not raise the price of the food beyond the reach of the population in greatest need.

Adulteration of foods

- Adulteration of foods is an age-old problem. It consists of a large number of practices, e.g.,
  - mixing,
  - substitution,
  - concealing the quality,

Adulteration of foods

- putting up decomposed foods for sale,
- misbranding or giving false labels and
- addition of toxicants.

Adulteration of foods

- Adulteration results in two disadvantages for the consumer :

➢ first, he is paying more money for a foodstuff of lower quality;

➢ secondly, some forms of adulteration are injurious to health, even resulting in death, as for example,

Adulteration of foods

- adulteration of mustard oil with argemone oil causing epidemic dropsy
- or adulteration of edible oils with trycresyn phosphate (TCP) resulting in paralysis and death.

Adulteration of foods

- Dals
- Coal tar dyes, khasari dal
- Haldi (Turmeric) powder
- Lead chromate powder
- Dhania powder
- Starch, cow dung or horse dung powder

Adulteration of foods

- Black pepper
  - Dried seeds of papaya
- Chili powder
  - Saw dust, brick powder
- Coffee powder Date husk, , tamarind husk, chicory

Adulteration of foods

- Tea dust/leaves
  - Blackgram husk, tamarind seeds powder, saw dust, used tea dust
- Butter
  - Starch, animal fat

Adulteration of foods

- Ice cream
  - Cellulose, starch, non permitted colours
- Milk
  - Extraction of fat, addition of starch, water
- Ghee
  - Vanaspati