FUNDAMENTALS OF COOKING

IX

NAVTTC

National Vocational & Technical Training Commission (NAVTTC)

Textbook of

Fundamentals of Cooking

Grade – IX

National Vocational and Technical Training commission

H-9, Islamabad

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PREFACE

This book has been written to meet the requirements of Matric Tech to train the students in the Fundamentals of cooking. Matric Tech in fundamentals of cooking has been introduced the first time in the history of Pakistan. The book covers 40% theoretical and 60% practical content. This book is designed to mirror the way that individuals cook in the kitchen today, with the best of food sources and flavors from the world. This book gathers information about food safety, workplace hygiene, and hazard analysis control point rules which are most important to become a professional cook and are basics of cooking. This book will guide how to store food at suitable temperatures. This book gathers all cuisines around the world. The fundamental of cooking includes the nutritional values of different cuisines. Complete with many plans and four-shading photos all through, this is the fundamental reference for any trying gourmet specialist, culinary student, or cooking expert. Food techniques and different cooking methods will help students to be a professional cook and will be beneficial in learning fundamentals of cooking. In this book everything is explained with details along with picture demonstrations and different activities.

Executive Director
National Vocational & Technical Training Commission
(NAVTTC)

Aims and Objectives

The specific objectives of developing these qualifications are as under:

- Provide students with a smooth transition to work.
- Develops job-readiness & enhance students' trade-specific employable skills and provide opportunities for the development of new skills.
- Provide students with the opportunity to obtain from Level II -IV technical training certification or equivalent in a given trade.
- To set high profile standard professions for the industry to generate standard outputs.
- To validate an individual skill, knowledge and understanding regarding relevant occupations.
- Provide flexible pathways and progressions in training and assessment field.

Table of Contents

Chapter 1: Hygiene and Personal Safety

Students learning outcomes:

After completing this chapter, you will be able to

- know about the importance of hygiene in food preparation industry.
- understand the merits of hygiene practices in kitchen
- understand the relationship between hygiene and health
- follow hygiene and safety at work
- know about the concepts of personal hygiene
- understand the basic rules of maintenance hygiene
- follow hand washing procedures and rules
- follow personal hygiene and chef's uniform for kitchen operations
- know basic principles and objectives of safety
- understand safety procedures
- handle kitchen tools safely
- recognize various (ppe) and their role in kitchen for maintaining safety
- follow personal protective equipment (PPE)

1.1 Introduction to Hygiene

Do you know about hygiene?

Hygiene refers to the set of practices associated with a personal health and safe food to avoid diseases like diarrhea & food poisoning.

Personal hygiene also portrays professionalism. In hospitality, It is extreme important to maintain high levels of personal hygiene, especially when you are working with food.

1.1.1 Importance of hygiene in food preparation industry

When handling food, wash your hands thoroughly and often. If you are sick or not feeling well do not go to food preparation area because you can contaminate food more easily.

Good personal hygiene is one of the best ways to protect you from getting ill. For Example,if someone eating unhygienic food, he/she can face serious illness like vomiting.

Do you know!

Contamination means presence of viruses and bacteria in food.

Following are the types of contamination:

1. Physical Contamination
2. Chemical Contamination
3. Biological Contamination
4. Food Allergens

1.1.2 Merits of different hygienic practices

Personal hygiene practices are the practices which can help you and the people around you prevent illness and it helps you to feel good about yourself and your appearance both.

In personal hygiene practices some practices which are involved are as follows

- Take daily shower
- Wash your hair regularly and shave whenever its required
- Avoid touching the hair during work
- Brush your hair before going to workplace
- Tie back long hair and cover it with hair net
- Avoid use of jewelry and makeup
- Keep your nails short and clean
- Use gloves while working

Good personal hygiene involves that you have to keep all parts external body clean and healthy. If the people who are working in the food industry have the poor personal hygiene their bodies provide the suitable environment for germs to grow, which can cause different types of infections and it will contaminated the food badly which can cause serious diseases for you and for your customers as well.

Merits of different hygienic practices

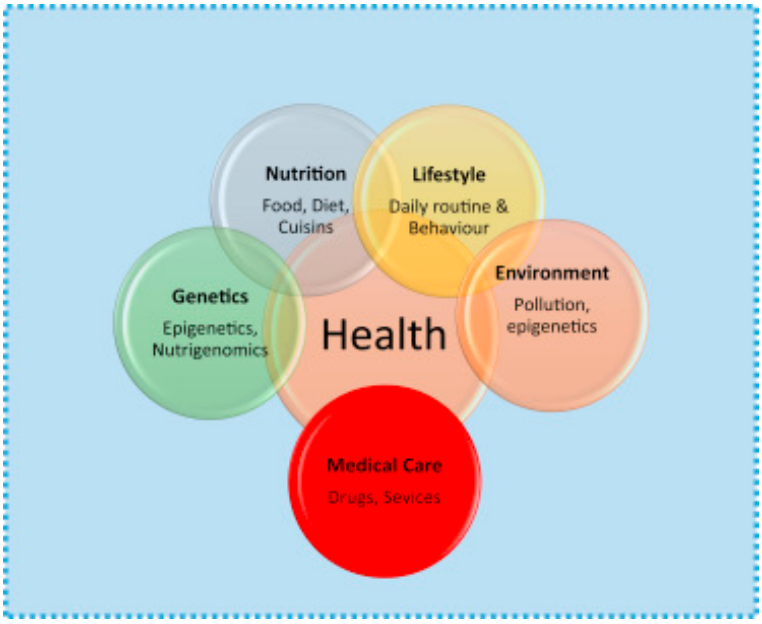
1.1.3 Relationship between hygiene and heath

Hygiene is a concept to cleanliness and healthy lifestyle. It is also related to personal as well as professional practices. If you maintain personal hygiene, you will maintain your health automatically. A healthy person can make your environment healthy.

A healthy person can make healthy food which will be free from any type of contamination. For example, Ahmad is perfectly healthy, he is baking a cake for his

customer, and he will do his job timely as well as hygienically. But if Ahmad is not healthy and suffering from skin infection, he will not perform his job correctly and cannot make healthy cake as well but he will also spread disease to others.

Hygiene is a practice of maintenance; maintain cleanliness for preserving health and the prevention of the spread of different diseases. Diseases like diarrhea, vomiting, skin infection, nausea etc. Food hygiene also increases the risk of spreading different diseases.



Relationship of health in different aspects

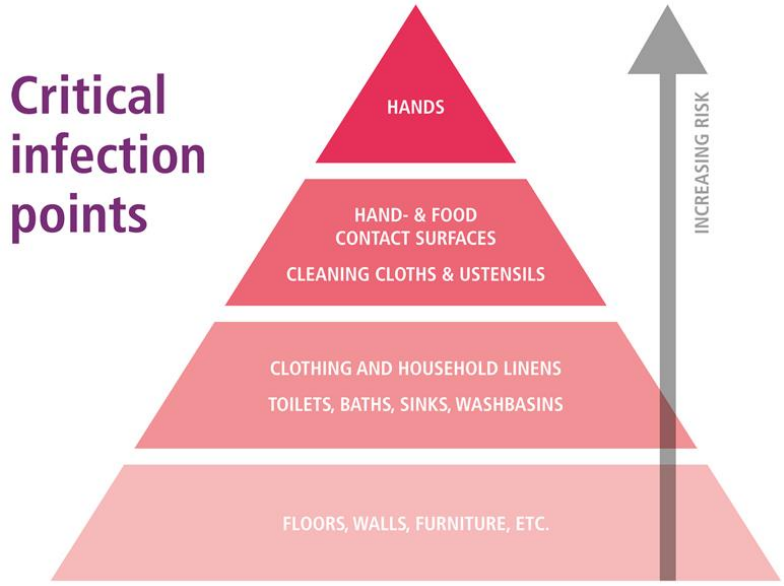
It is a practice of cleanliness for preserving health and prevention of spread of different diseases which are dangerous for health. The word hygiene is derived from a Greek language which means “An act of health”. Many times hygiene refers to the personal hygiene of a person which means maintain the cleanliness in your whole body. The common act of personal hygiene includes washing your hands, taking a bath, brushing your teeth, cutting of nails etc. As per as personal hygiene, food hygiene is very important and crucial.

The common food hygiene practices are

- Cleaning your food
- Using clean utensils
- Proper cooking of food
- Proper storing of food
- Reheating of food

- Serving of food
- Maintain temperatures

Food hygiene is also a cause of increase the risk of spreading many diseases which all are injurious to health. Unhealthy and dirty food may contain different type of microorganisms like viruses and bacteria in it. The food which contains harmful microorganisms can cause sickness and illness. Bad hygiene practices may allow germs and harmful microorganisms to enter our bodies and make us sick. We could also unknowingly spread the germs to the people, which can fall them ill. Some examples of different diseases which can spread easily because of the poor hygiene practices are diarrhea, influenza, hepatitis A, and even COVID-19.



Some critical Hygienic Practices

1.1.4 Hygiene safety at workplace

As a food handler, not only must you follow your organizations hygiene procedures diligently, you must keep alert to any activities that breach these standards. The following unsatisfactory hygienic practices are listed below:

Incorrect cleaning practices

I. Outdated practices that are not consistent
II. Contaminated food

III. Presence of vermin or pests
IV. Any airborne dust
V. Contaminated linens
VI. Dirty equipment and utensils
VII. Contaminated rubbish

Brain Teaser!

The average work station is 400 times unhygienic than a toilet seat.

Different Hygienic practices in Workplace Hygiene

1.2 Personal hygiene

Tell me in your words about your personal hygiene practices before you came to school on regular basis?

Personal hygiene is actually defined as the cleanliness of internal and external body. Personal hygiene is how you keep your body healthy. It includes taking shower, cleanliness and sanitization of your hands, keep your teeth cleanetc. Personal hygiene is very helpful and healthy practice for you and the environment around you.

Basic personal hygiene practices

Personal hygiene is how you care for your body at home, as well as at your workplace. This practice includes bathing, washing your hands, brushing your teeth's and many more.

Every single day you come in to contact with millions of outside germs and viruses. They can linger on your body, and in some cases they can make you sick badly.

Personal hygiene is very important practices which can help you at the people around you prevent illness and spread of diseases in food. This can also help you feel good about your presence and appearance of your organization.

Good personal hygiene can prevent food poisoning and make good food business sense. Customers like to see food handlers who strictly follow hygiene as well as practice safe food handling.

Personal hygiene tips for food handlers:

The following tips for the prevention of food poisoning for food workers are:

1. Wash, sanitize and dry hands before handling food.
2. Dry your hands after washing with disposable paper towel after the end of each task.
3. Never smoke or chew in food premises
4. Never cough or sneeze over food
5. Wear clean and sanitize personal protective equipment
6. Keep your personal items including mobiles away from food production areas
7. Keep finger nails short so they can clean easily
8. Avoid wearing jewelry or rings
9. Completely cover all cuts and wounds with bright color bandage
10. If you feel unwell, then don’t handle food.

Personal hygiene for Food handlers

How to create a personal hygiene routine?

If anyone wants to improve his/her personal hygiene, some strategies are there which can be very helpful

1. **Set reminders:**

   If you cannot remember to do things like shower, wash your hairs, clip your nails or brush your teeth, set a reminder on your phone.

2. **Use signs:**

   Put a little sign by the plate or bowl in kitchen to remind yourself to wash your hands before eating. These signs can help you and jog your memory and improve your habits.

Hygienic signs in commercial kitchens

3. Practice makes effect:

It takes time to learn a new habit start with a new habit at the beginning of the week and make it your priority. Practice it for a week or two when you feel comfortable with it at a new one. Overtime, you'll establish the habits you wish to have.

Hygiene is the practice related to health, medicine and cleanliness. It is as well related to personal as well as professional care practices. Personal hygiene practices refer to maintaining cleanliness of one's body and clothing.

Figure about concept of personal hygiene

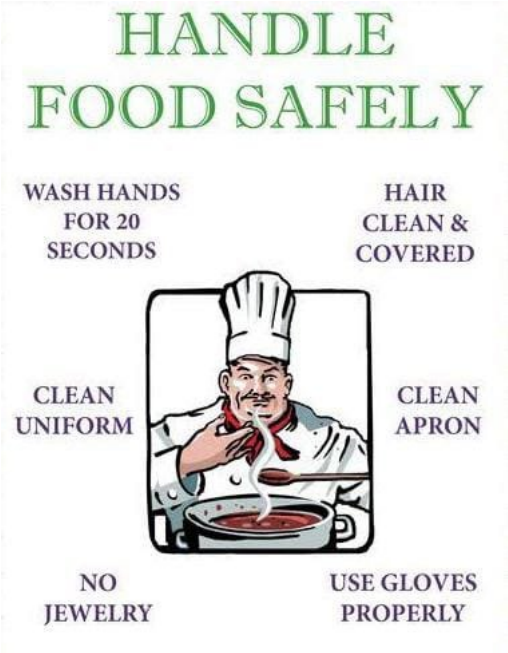
Activity:

Arrange the class in small groups and assign them the task to search about the basic concept of personal hygiene. Prepare a dish by using principles of personal hygiene.

1.2.1 Basic rules of hygiene

Good personal hygienic rules are following:

I. Take shower on daily basis
II. Shave your beard (if required)
III. Keep your hairs clean
IV. Clean and sanitize your hands before and after every task
V. If you have long hairs, you should tie back your hairs and covered them with hair net
VI. Makeup and jewelry are not allowed in kitchen
VII. Your nails should be clean and short
VIII. Do not apply nail polish on your nails
IX. If you have any cuts, abrasions and open sores, keep it cover with bandage
X. Do not touching or scratch your body parts while you are working in kitchen.



Some basic rules of Personal Hygiene

1.2.2 Hand washing procedure and rules

Hands are the major conductor of diseases. They are constantly in contact with food, surfaces, our bodies and other people. Washing hands regularly is essential, equally important as the hand washing processes using the appropriate facilities:

Do you know!

Hands usually come in contact with around 10 million bacteria per day.

I. Wet your hands.
II. Latter hands with an antibacterial liquid soap
III. Scrub your hands properly between the fingers and wrist,up to the elbows and under nails
IV. Wash(rinse) your hands with a tap water
V. Dry your hands with the help of paper towel
VI. Use sanitizer
VII. Repeat this process throughout the day

Hand washing procedure

1.2.3Personal Hygiene and Chef Uniform for Kitchen operations

Uniforms are a basic part of a chef's life. It is specially designed for the protection as well as hygienic reasons for a chef. A chef uniform contains different parts such as chef hat, chef coat, pants, apron and shoes. Use all personal hygiene principles while wearing chef uniform as defined in previous topic 1.1.4

Important Note!

The four baselines of safety

1. Awareness of safety hazards
2. Stay informed
3. Attend complete training
4. Identify unsafe conditions

1.3 Personal Safety

Why personal safety is important during operations in kitchen?

Personal safety depends on our own awareness of potential hazards and risks.

1.3.1 Basic principles and objectives of safety

The major objective of workplace safety is to help and prevent workplace illness, injuries and any kind of mishaps according to the requirement of the workplace.

Another principle of workplace safety is removing and reducing current dangers to improve all types of working conditions.

For example Ali is working in kitchen without safety shoes, Hassan is cleaning the floor of kitchen with water and detergent, he did not place wet floor safety sign, that's why Ali

slipped because he didn't wear safety shoes. He had serious backbone injury because he neglects his personal safety.

1.3.2 Workplace Safety procedures

Safety procedures in workplace are the steps which include:

Slip, trip and fall

Key impacts that contribute to slip, trip and fall are following:

I. Personal issues such as staff not following SOP's, ignoring basic process and not applying attention to detail. Ignoring basic safety applications due to pressure or ignorance

II. Neglecting safety precautions includes incorrect work practices, ignoring PPE and not adhering to machinery SOP's.

Do You Know!

- PPE stands for Personal Protective Equipment
- SOP's means Standard Operating Procedures

III. Drugs and Alcohol as well mental instability can also because issuesbe aware of sign display by a person effected.

IV. Excessive speed during jobs also causes danger as the staff member is unable to pay enough attention to the job. Itcauses risk of injury.

Do you know!

Hazards are anything that has the potential to cause injury, death or illness in the workplace. It can arise within or outside from the workplace.

V. Design issues such as poor cleaning standards, badly design buildings, floors, surfaces are substantial contributors to slip, trip and falls.

VI. Distractions from the job such as loud music, fooling around and loosing are further contributors.

Manual handling:

Manual handling is a process of any transporting or supporting of a load including the lifting, putting down, pushing, pulling, carrying or moving any load by hand or bodily force.

The four basic key areas of manual handling are as follows

- Nature of the task
- Capabilities of the individual performed the task
- Characteristics of the load
- Layout of the environment

Common types of manual handling tasks

There are five common types of manual handling. Manual handling covers a wide range of different activities including lifting, pushing, pulling, folding, restraining, throwing and carrying. It includes repetitive tasks such as packing, typing, assembling, cleaning and sorting using different hand/tools.

Correct Manual handling

Manual handling includes

- How to lift a load
- How to put down the load
- How to push a load
- How to pull a load
- How to carry and move the load

Chemical handling:

Whenever handling chemicals, it is important to know about correct lifting procedures? Nature of chemical? How heavy is the chemical? How far does it need to be moved? Is it solid, liquid or hot?

Whenever carry chemicals, always use a trolley to shorten the distance, use correct equipment's, use PPE where needed (gloves and aprons). Liquid can splash over so either transfer into a close container.

Handle kitchen tools safely

Activity: Assign a task to the group of students to examine kitchen tools, equipment and their proper utilization.

Do you know?

Contaminated surfaces cause almost 80 % spreading of infections.

1.4 Personal Protective Equipment (PPE)/Uniform

1.4.1 Parts of uniform and their role in kitchen

Personal Protective Equipment/Uniform are the foundation of professional image of a chef. These are specially designed to maintain personal and workplace hygiene and safety. Uniform is made for special purposes and each item of it performs a special purpose.

I. **Chef cap or Toque Blanche** use for covering hairs. It also prevents sweat and bacteria from damaging the food.
II. **Chef coat** must be in light color and ample to allow for air circulation. It should not have external pockets and buttons. Use the protection of long sleeve. It can prevent contamination from arms.
III. **Pants** also provide protection and must be kept clean.

IV. **Aprons** are also protective and should not be used to wipe your hands. Use paper towel for this purpose.

V. **Safety shoes** need to be cleaned and polished to prevent food item from sticking. They also need to have non slips soles. Leather uses without laces are preferable.

	
Chef coat	Chef mask
	
Chef gloves	Chef safety shoes
	
Chef apron	Chef cap

Chef Uniform

1.4.2Follow PPE

Personal Protective Equipment (PPE) is an important component of the health and safety plan.PPE includes disposable gloves, goggles, mashed gloves, disposable aprons, and rubber boots. The Functions of PPE are varying from handling chemicals to contaminated bed linens or syringes left behind by a hotel guest.

Personal protective equipment is protective clothing, helmets, goggles, or other garments or equipment's design to protect the wearer's body from injury or infection. The hazards which can transfer by the personal protective equipment include physical, electrical, heat, chemicals, bio hazards and airborne particulate matter.

PPE is the equipment which can minimize exposure to hazards that can cause serious workplace injuries and illnesses. If the PPE does not fit properly, it can make the different between being safely covered or dangerously exposed.

PPE checklist for Food Handlers

Key Points

- Personal hygiene is actually defined as the cleanliness of internal and external body. The purpose of personal hygiene is to keep your body clean and healthy. It includes taking shower, cleanliness and sanitization of hands, keep your teeth and uniform clean.
- Hygiene refers to the safe practices associated with personal health and food safety to avoid the common diseases like diarrhea & food poisoning.
- Poorpersonal hygiene isa practice of neglecting the cleanliness practices relatingto your body. Inappropriate sanitization of your body causes poor personal hygiene.It can cause serious illness and diseases.
- Uniforms and Personal Protective Equipment are the foundation of professional image of a chef. It is specially designed for many reasons such as professional image, hygiene purposes.

Exercise

Mark to correct option.

1. Which one of the following is poor hygienic practice?
   a. Cutting nails
   b. Covering cuts and wounds
   c. Apply perfume
   d. Covering hairs with cap
2. In hand washing procedure, water should be
   a. Luke warm
   b. Cold
   c. Hot
   d. frozen
3. The proper time for washing hands with warm water is?
   a. 20 sec
   b. 10 sec
   c. 1 min
   d. 2 min
4. Which one of the following is not a part of PPE?
   a. Touque blanche
   b. Safety shoes
   c. Chef coat with pockets
   d. Gloves

Give short answers.

1. Enlist common merits of hygiene?
2. Describe hand washing procedure after completing the task?
3. What is the proper procedure to keep raw and cooked meat in the same refrigerator?
4. How a box of 50 Kg apples is correctly lifted?
5. Why steel workstation is considered safe for food production than a wooden workstation?
6. Why makeup and jewelry are not allowed in kitchen?

Answer the following question in detail.

1. Explain the procedure for shifting of materials from one place to another in a kitchen?
2. What are the causes of slip, trip and fall in kitchen?

Activities

1. Divide the class into small groups; give them a task to observe any 5 hazards in workplace.
2. Perform manual handling procedure under the supervision of teacher.
3. Arrange the class into small groups. Assign them a task to prepare chart on importance of Personal Protective Equipment (PPE).

Note for Teachers

- The teacher is required to give demonstration on hand washing procedure. He/she also guide them about different hand washers and sanitizers and their uses.
- The teacher is required to demonstrate the use of Personal Protective equipment and recognize various parts of it. It is also important to ensure that students are properly following the concept of personal hygiene.

Chapter 2: Workplace Safety and Environment

Students learning outcomes:

After completing this chapter, you will be able to

- learn the importance of safety at workplace
- recognize hazards in the workplace
- understanding of hazards and threads like gas and electrical hazards
- learn about the dangers posed by equipment
- understanding the operation of gas and electric appliances
- follow standard process for kitchen cleaning
- know about fire triangle and types of fire
- understand fire extinguish types
- follow the correct fire extinguish methods
- understand correct evacuation procedures
- identify fire hazards.

2.1 Workplace safety

What do you know about workplace safety?

Preventing injuries is a key objective of a safe workplace. Managing staff effectively also means to look after their welfare and as the saying goes.

"Prevention is better than a cure"

Workplace safety is basically the safety of your workstation and premises of workstation. Cleaning and sanitization both are two major aspects of workplace safety.

2.1.1 Importance of safety at workplace

A healthy and safe workplace not only protects people from any kind of disease or injury but it can also lower the risk of illness costs. It also reduces turnover and increase the productivity, quality of food and also raise the employee's morale.

Workplace safety refers to the limitation of elements that can cause harm, accidents and other negative outcomes in a workplace. It represents a culmination of policies behaviors and precautions that work to limit hazards, accidents and other kinds of harm in a working environment.

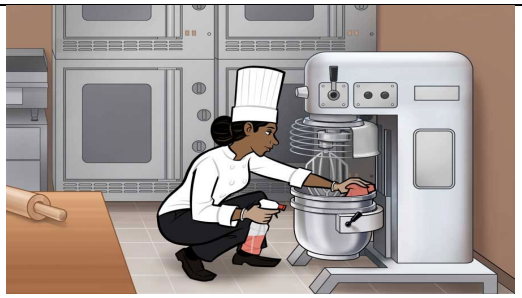
A safe and healthy workplace not only protects workers from injury and illness, it can also lower the chances of injuries or illnesses. It also reduce the absenteeism and turnover, it increase the productivity and quality. It also increases the self-confident of the employees. In simple words, safety is good for any business. Plus, protective workers are the right thing to do.

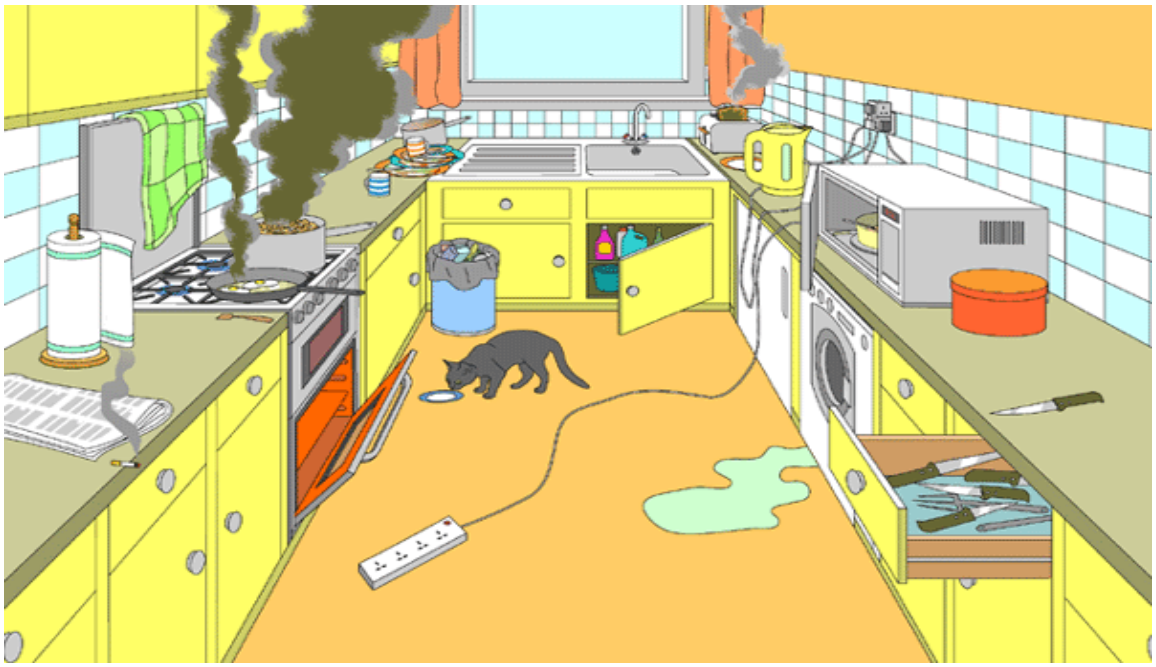
Workplace safety promotes the wellness of employees because a workplace environment which is free from injury and accidents attracts employees, because employees are more satisfied and productive in such an environment. A safe workplace environment is essential for both employees and employers alike.

2.1.2 Recognized hazards in the workplace

Some basic ways to identify the hazards in the workplace

1. Conduct regular work site inspections. Walkthrough the worksite and visually assess the type of equipment's, work practices and any potential hazards that could be harmful for workplace.
2. Interview workers and managers
3. Create a hazard map
4. Monitor, measuring and testing the working environment such as noise monitoring, electrical testing and atmospheric testing.
5. Analyzing proposed new or modified plants, materials, process of structure which is conducting hazards or risks.
6. Survey reviewing product information for example safety data sheets, operating manuals etc.

	
Ignoring wet floor sign	Cleaning machine during processing
	
Fire in frying pan	Slip because of non-slippery safety shoes



Activity: Arrange the class into 3 groups and look at the above picture and recognize any 5 hazards in kitchen?

2.1.3 Types of hazards and threats

The following are common types of hazards and threats:

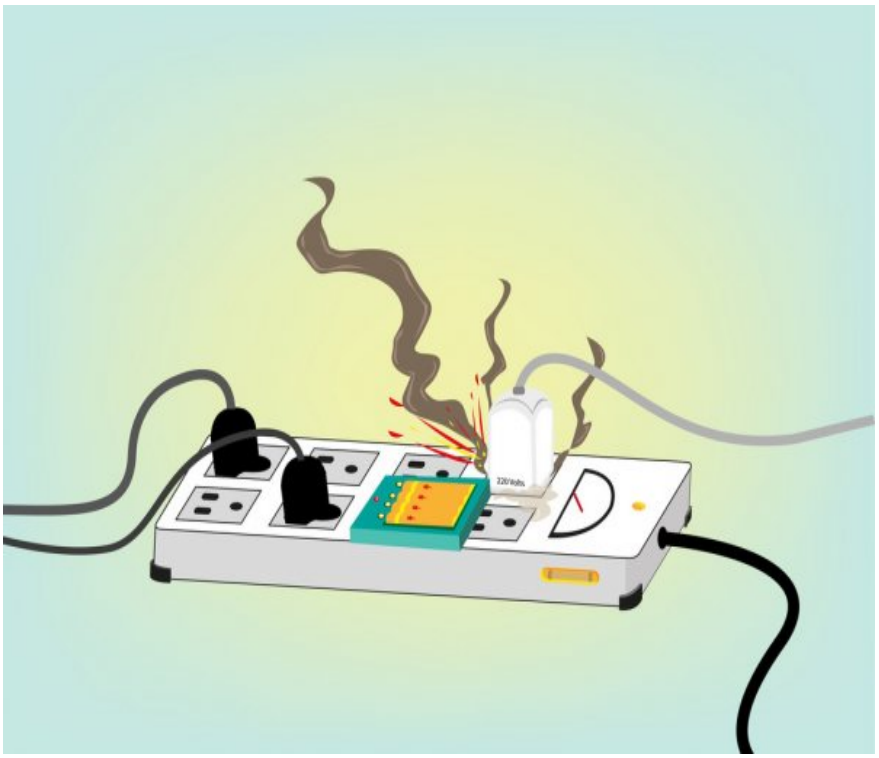
I. Gas and Electricity

Gas leakage is a major hazard in food industry. In all food industry there is a legal obligation for everyone to aware from this hazard. Gas leakage take place through different reasons such as damage pipes, connectors, old equipment without automatic shutoff, over heated or poorly maintained cylinders or appliances.

Attention!

- Follow the given instructions when using a tool or machine.
- Always be alert in your workplace.

Electrical faults easy broken or brittle leads leading to contact of wires, incorrect wiring, and overloading power points by plugging in too much equipment.



Electrical hazards

II. Environmental hazards

Environmental hazards are basically falling into these categories

1. Physical Hazard (occur naturally in the environment e.g., Heavy Rain Fall)
2. Chemical Hazards
3. Biological Hazards

The most reported environmental hazards are poor ventilation, allergy activators, vermin's, fire and burns.

Any chemical or liquid on the floor, congested spaces, and vermin's, damage kitchen utensils and equipment's, broken tiles, and are some common types of kitchen hazards.

Few examples of environmental hazards

III. Ergonomic Hazards

It includes movements that occur again and again, vibrations, high temperatures and bad postures that can take place due to improper working methods and poorly designed workstations, tools and other equipment's.

Some Common Examples of Ergonomic Hazards are:

- Improper adjustment of workstations and chairs
- Incorrect lifting
- Poor posture during work
- Using too much force, especially if it's done frequently
- Vibration

Ergonomic hazard

Ergonomic risk factors

2.2 Equipment Handling

Equipment handling can be classified into the following four major categories

1. Transport of equipment
2. Positioning of equipment
3. Assessment of Unit load formation for equipment
4. Storage of equipment

Material handling equipment is used for the moment, storage, and control, protection of materials, goods and products throughout the process of manufacturing distribution, consumption and disposal.

In any kitchen or workplace always use microwaves, pans and pots, toasters and other cooking appliances only with food inside and stay in the kitchen while operating with these appliances. Always keep gas and electric stoves and other appliances in the top working condition to avoid gas leaks and electrical shocks.

Procedure for using and handling of knife:

Store your knife safely in a butcher's blocks or drawers putting them away right after washing. Keep knife sharp for safe, smooth cutting and slice or cut food only on a cutting board, angling the blade away from yourself. Keep your cutlery clean but never toss a blade into a sink or wash basin.

Interesting information!	
Prevention of cuts& burns	
Do's	Don'ts
Keep your knife sharp	Don't use blunt knife
Use color coded cutting board for cutting	Don't use the same cutting board for cutting vegetables and meat.
Know the exact location of fire extinguisher	Don't use expired fire extinguisher
Be aware of hot pot handles	Don't use outdated/ damaged pots.
Perform careful cleaning of knife after completion of each task.	Don't put knife in a sink, under water
Ensure safe handling of knife	Don't try to catch a falling knife
Always keep hot fat at safe place	Don't left hot fat in the kitchen
Ensure presence of smoke detectors in kitchen	Don't smoke in kitchen

Activity:

Plan an industrial visit to observe handling of different tools, utensils and equipment.

Do you know?

- Approximately more than 320,000people, worldwide, had to visit hospital due to knife wound at one point.
- Infrastructure is a key risk factor which produces hazards.

2.2.1 Dangers posed by the equipment

Moving parts of different kitchen equipment, blades, exposed wires, nip points are some major hazards of working in the kitchen with different kitchen equipment

Different type of serious injuries can take place due to the negligence while using kitchen equipment such as Cuts, Bruises, fractures, Burns etc. Dangers posed by equipment and stock items are listed below

- **Improper storage:**
  Always keep in mind that heavy items are stored on the top shelf and liquid items are stored above eye height in a specific deep shaped bowl.
- **Contact:**
  Some equipment's and stock items can cause injury by slipping and squashing body parts. Hot equipment and stock items such as hot coffee pan can lead to burns.
- **Ejection:**
  Some equipment can have some parts that can eject e.g. draws of cabinets doors can open when carrying items, liquids that slops over the top.
- **Entanglement:**
  Equipment can cause injury ifthese equipment have cords or wires with it.

Activity

Students should go to their workplace areas and examine different types of kitchens equipment and enlist 5 hazards which may take place due to kitchen equipment.

2.2.2Operating procedures of gas and electrical appliances

Whenever you are working in a food preparation area, you had to understand that how to use gas and electrical appliances. You have to clean appliances on daily bases after completing your work. Check all the appliances (gas & electrical both) that there is no damage of wires, buttons and switches take place. You have to check sockets as well on daily basis. It can be very dangerous if any kind of damage is present in any appliance or equipment which is related to gas and electricity.

Important tips for gas and electrical appliances for kitchen safety:

- Don't leave electrical appliances running unattended e.g. dishwashers or washing machines.
- Don't wrap warm flexible wires around the equipment.
- Use appliances which are in a good condition such as kettles and toasters.
- Don't try to clean or repair any plugged in appliance.
- Clean your oven and grills after every usage because fat and grease is a major cause of fire.
- Don't overload your electrical appliances and check plug sockets regularly.
- Don't store any object on the top of any electrical appliance which can block ventilation.
- Clean and defrost your fridge and freezer at least after 2-3 months to ensure it does continue proper working.
- Use smoke detectors and fire alarms in the workplace to avoid any unpleasant accident.

2.2.3 Standard process for kitchen cleaning

The most practical process for cleaning is to "clean as you go". The clean as you go method is a method in which different opportunities takes place to clean continually throughout the working day and make every part of your kitchen clean and ready to

work to ensure that surfaces, equipment, wastes, and the premises of your workstation and kitchen are clean, hygienic and clutter free. Remove outer packaging of the food and throw it properly in a correct way in the bins before it is bought into the kitchen or store room. Packaging may have been in contact with the dirty surfaces and it can cause serious and dangerous contaminations.

The general cleaning procedure for a kitchen is then 6 stage cleaning method. The steps include:

1) Pre-clean- remove all the food debris, rubbish or dirt from the area.
2) Main clean- use separate equipment and water to clean food preparation benches and other areas.
3) Rinse – rinse with clean hot water to comply with health regulations.
4) Disinfect – sanitize all equipment
5) Rinse – again rinse all equipment with hot water
6) Dry – dry surface and equipment with paper towels before. use

Interesting Information!

A commercial toaster can toast 70 slices of bread.

A commercial juicer will make 250L OF juice

A commercial coffee maker will make 75 cups of filtered coffee.

Cleaning of oven in kitchen

2.3 Fire Safety and Hazards

What are the fire hazards in the workplace?

The hazards, which are present in the workplace, are

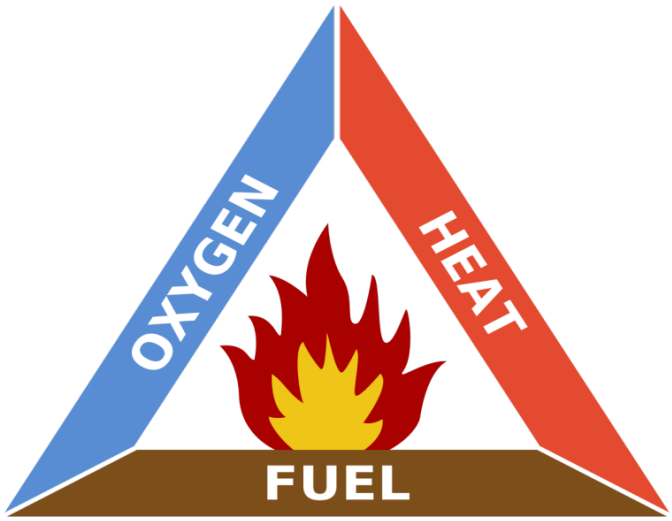
- water - reactive metals
- Combustible metal dust.
- Dip tanks using hazardous materials
- Heat treating operations
- Combustible and flammable liquids
- Pyrophoric materials (these substances are the substances that ignite instantly upon exposure to oxygen.

The following are the resources of fire hazards:

- Contents
- Identify the source of ignition
- Identify sources of fuel
- Identify sources of oxygen
- Look for possible sources of heat that could get hot enough to create a fire such as: Cigarettes, Match box, lighters etc.

Fire hazards present in kitchen:

- Cooking
- Arson
- Open flame (candle/incense).
- Improper handling and storage of flammable liquids
- Residential furnishing
- Electrical (wires, appliances and equipment's)



Sources of fire

2.3.1 Fire triangle and types of fire.

A fire triangle is a very simple and unique model which is used for understanding the main ingredients or factors due to which fire can take place

The following items help in spreading of fire

- Oxygen
- Heat
- Fuel

Types of Fire

Types/Classes of Fire are as following

- Class A - fires involving solid materials (wood, paper or textiles).
- Class B - fires involving flammable liquids (petrol, diesel or oils).
- Class C - fires involving gases. (CO2)
- Class D - fires involving metals. (iron)
- Class E - fires involving live electrical apparatus. (Short Circuit)

Types of fire Extinguisher	Class A- combustible material e.g. paper wood	Class B- Flammable materials e.g. paint & patrol	Class C- flammable gases	Class D- Flammable metals	Class E- electrical equipment
Water	✓	×	×	×	×
Foam	✓	✓	×	×	×
Dry powder	✓	✓	✓	✓	✓
CO2	✓	✓	×	×	✓
Wet chemical	✓	×	×	×	×

2.3.2Types of fire Extinguisher

All the fires can be extinguished by cooling, smothering, starving or by the interrupting in the combustion process of extinguish the fire. One of the most common methods of extinguishing a fire is by cooling with water. There are 3 main methods for extinguishing a fire

Foam type, powder type, Water type, Wet Chemical, CO2

- **Smothering (Cut-off the air supply):**

Smothering is a process in which oxygen can exclude from the surrounding atmosphere. The fire will be extinguished by this method. Smothering can be achieved by using sand, blanketing, and form application or by the use of any chemical extinguishers.

Important Note!

Smoother is used to extinguish fire B class.

Class B fire, when a class B fire sparks, extinguish it by smoothing the flames. We can extinguish the fire by eliminate the oxygen feeding the flames. Dry chemicals like ammonium phosphate or pressurized carbon di oxide are effective means to extinguish a class B fire.

- **Cooling (Through cooling agent such as Water):**

  In the cooling water is used to extinguish the fire. Water provides the heat absorbing (cooling) effect on the burning material extinguish the fire. When water is evaporated it cause energy and this energy is taken away from the fire.

Important Note!

Do you know that which type of fire do you cool to extinguish it?

Class A fire extinguishers are usually water-based.

- **Starving (by removing the flammable material e.g. Fuel)**

  Starving is a method of extinguish the fire by removing the fuel from the surroundings of fire. It is a process of depriving the fire of fuel for example combustible materials. It involves flammable gases such as natural gas, petroleum gas, butane, hydrogen, acetylene or propane. These gases are highly combustible and may cause fires and explosions on a large scale.

Important Note!

Which type of fire is extinguished bystarving? Starving procedure is used for**Class C** fire extinguishers.

2.3.3 Correct fire extinguisher methods

All the fires can be extinguished by cooling, smothering, starving or by the interrupting in the combustion process of extinguish the fire. One of the most common methods of extinguishing a fire is by cooling with water. Correct fire extinguisher methods are explained in the previous topic 2.3.2.

2.3.4 Correct evacuation processes

Correct fire evacuation processes include some important steps which are as follows.

I. Activate the fire alarm
II. Call fire fighters immediately and gave them all the information regarding to the workplace.
III. Take injured persons to the medical emergency of your organization
IV. Exit the organization following emergency map

2.3.5Identify fire hazards

Hazard Report Form Date: _____ Hazard Report Number: _____ Reported By: Name: Position: _____ Reported To: Name: Position: _____ Site location: _____ Subject: Incident Near Miss Workplace Hazard Hazardous Work Practice Description of Hazard:

_____
_____
_____
_____
_____
_____

_____
_____
_____
_____
_____ What needs to be done?
_____
_____
_____
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_____
_____
_____
_____
_____
_____
_____
_____ Signatures: _____ Dated:
_____ Copy Given to: Executive Chef:
_____ (Signature) General Manager:
_____(Signature)

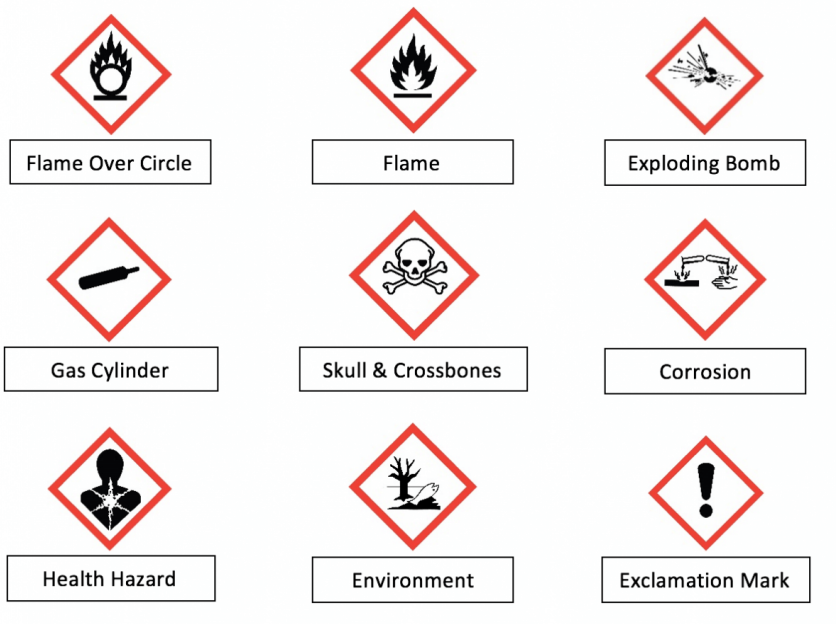
Identify any fire hazard is an actual aim of the fire risk assessment. Eliminate or reduce the risk of fire hazards that is reasonable. If a fire starts, it is very important to make sure that the safety of people in the workplace is assured. Steps of identify the fire hazards are

1. Step 1. Identify the fire hazards
2. Step 1. Identify fire hazards. Identify the sources of ignition. Identify sources of fuel. Identify sources of oxygen. It is very important to identify the sources of heat that could get hot enough to create a fire such as cigarettes, matches, lighters, wires etc.

Some common examples of fire hazards are

- Arson
- Cooking
- Smoking materials
- Open flame (candles/ incense)
- Electrical appliances

- Wiring and equipment
- Residential furnishing
- Accumulation of combustible materials
- Improper handling and storage of combustible/flammable liquids
- Use of halogen lamps
- Space heaters
- Hot work hazards(cutting and welding)



Fire hazards

Key Points

- Workplace safety is basically the safety of your premises of workstation. Cleaning and sanitization both are two major aspects of workplace safety.
- Hazards is anything which having potential to cause harm. It includes physical, chemical, ergonomic, biological and psychological hazards.
- Moving parts of different kitchen equipment, blades, exposed wires, nip points are some major hazards of working in the kitchen with different kitchen equipment. Different type of serious injuries can take place due to the negligence while using kitchen equipment such as Cuts, Bruises, fractures, Burns etc.

- Fires are based on variety of flammable materials. Commonly gas and electricity, wood and paper fires. These are classifying as solid fire, liquid fire, gas fire, metal fire and electrical fire.

- There are three main method of fire extinguisher:
    - Soothing
    - Cooling
    - starving

Exercise

Mark the correct option

1. Which is the first step to take if a frying pan catches fire?
   a. Turn of the flame
   b. Cover the pan
   c. Call the emergency squad
   d. Put water on pan
2. Specially designed gloves are used for
   a. Heavy lifting
   b. Cold product
   c. Hot product
   d. Cooking
3. Which of the following is the safe way to lift heavy weight?
   a. Use your body to push the weight
   b. Ask someone for help
   c. Put it on your back
   d. Use trolley
4. Which is the first step to extinguishing the fire?
   a. Call the doctor
   b. Call the police
   c. Press the fire alarm
   d. Call the manager

Give short answers

1. Describe the organizational hazards?
2. Define OH&S?
3. What is the safe procedure for lifting/handling of equipment?
4. Write the four benefits of Risk Assessment?
5. Write different methods for fire extinguisher?

Answer the following question in detail.

1. Explain the dangers posed by handling or shifting of equipment in a workplace?
2. Define a hazard? Explain the types of hazards?
3. Describe correct evacuation procedures?

Activity:

Arrange the class into 5 groups, plan an industrial visit, each group observe and identify different hazards in the workplace

Note for Teachers.

- Demonstrate Health and Safety Rules. The teacher is required to demonstrate the students' rules for health and safety about conservancy& general provision, medical appliances, First aid, precautions against fires, firefighting& Equipment.
- Mock Exercise on SOPs of Health and Safety. The teacher is required to plan mock exercise on Safety and Health Rules in case of fire, wearing of PPEs, Report general provisions for health and safety in the campus.
- The teacher is required to give demonstration/ instructions to the students for proper use of fire extinguishers for different kinds of fire. He should also demonstrate the fire safety equipment.

Chapter 3: Food Safety and Hygiene

Students learning outcomes

After completing this chapter, you will be able to

- understand food safety points and procedures
- define food hygiene
- understand food poisoning & contamination
- know about food labeling
- understand storage instruction
- identify danger zone
- understand the methods of food preservation
- understand heat treatment procedure
- know food contamination
- classify reasons/ factors of food contamination
- follow standard procedures to avoid contamination
- understand risks and hazards associated with garbage and wastage
- know sop's for waste management
- comprehend garbage handling and safe disposal

3.1 Food Safety Procedure

What do you know about Food Safety?

Food safety system is a system to safe the food and control of different food hazards at every stage of food preparation, production and storage of food that prevent food borne illness. Food safety is also known as Food Hygiene.

3.1.1 Food Safety Procedures and points

Food safety procedures prevent spread of food borne illnesses. It helps to maintain a clean, physical appearance of industry. Food safety procedures produce more streamlined processes and less wastage.

Food hygiene is most important in food industry. Good food safety procedures help to maintain minimum waste. For example, if tomato is stored correctly in refrigerator, it will last longer and less will be wasted.

The four steps of food safety procedures are as following

1. Clean
2. Separate
3. Cook
4. Chill

Basic food safety rules

Some basic food safety rules which are very important for the safe and hygienic food are as follows.

1. Practice safe selection of food items
2. Keep the edible things clean
3. Change of dish towels, dish clothes and sponges regularly.
4. Produce fresh products before eating
5. Avoid cross contamination
6. Minimize danger zone
7. Store, cook and serve food at their specific temperatures
8. Keep hot, cold cooked, uncooked, wrap and unwrap food separately.
9. Keep dairy and meat separately in different stations.
10. Thaw frozen food safely
11. Handle and store leftovers with care
12. Transport your food safely at correct temperatures

Basic food safety rules

3.1.2 Food hygiene

Food hygiene is a basic aspect of food safety. It includes the processes that directly refer to the food. It includes storing, preparation, cooking and serving. It is the methodology which describe that how to handle prepare and store the food in such ways that prevent food-borne illness.

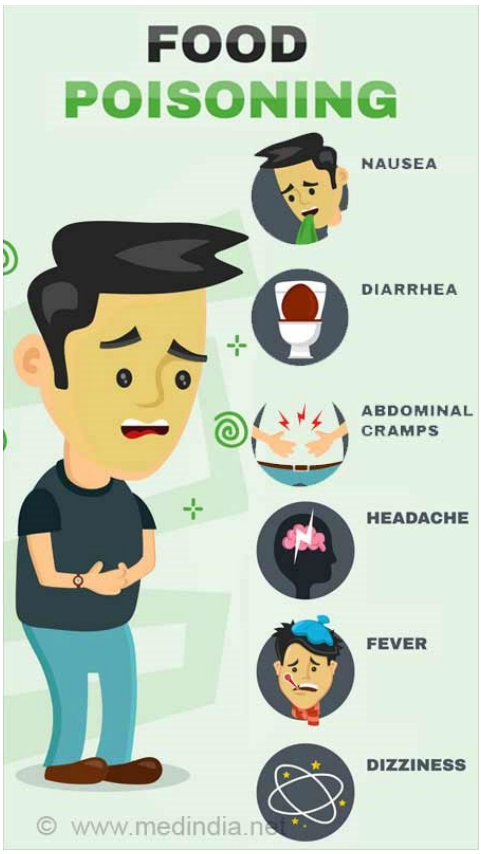
Important steps for food safety

Food hygiene is also defined as food safety. It includes handling, preparation and storing food that best reduce the risk of food borne diseases. The principle of food hygiene is to prevent food from contaminated and cause food poisoning.

Aspects of unsafe food

3.1.3Food poisoning & contaminations

Food poisoning is defined as consumption of contaminated food by a person, which results in health problems. Common indicators of food poisoning are diarrhea and vomiting.



For example, Aqsa purchased burger from a stall; food is contaminated with dust, sweat. She consumed burger and fell ill badly with vomiting and diarrhea. She was affected with consumption of contaminated burger which results in food poisoning.

Do you know!

Contaminated food is a food in which already bacteria, viruses(biological), dust particles, wood particles (physical)substance and toxins (chemical) are present.

Contamination is defined as the presence of bacteria, viruses and toxins materials in food. Contamination is of three types

1. Physical contamination is a type of contamination in which some physical contaminant adds in food e.g., hair, dust, wood, glass chards etc.
   Physical contamination can prevent through rule of WPRS (Wash peel Rewash). It means wash food before preparation, then peel and lastly rewash in water or sanitizer.

2. Biological contamination is a type of contamination in which food become contaminated by microorganisms like bacteria, viruses and fungus.
3. Chemical contamination is a type of contamination which includes some chemical add as contaminant in food like dishwashing soap, pest spray etc.
4. Food allergens are the type of contamination in which some specific ingredient causes allergies to particular people.

Contaminating agents

3.2Food Storage conditions

Different foods are store in different temperatures. Storage is divided into 2 types.

1. Dry storage:

Dry storage is a type of storage in which dry ingredients are stored at ambient temperatures. In dry storage, we store dry ingredients such as cereals, flours, rice, dry pastas, fruits, vegetables, tined products and canned products. A good part of dry storage is that they do not require a specific temperature like refrigerator and frozen foods.

2. Wet storage:

Wet storage is a type of storage in which we can store food for less than 60 days. Wet storage is a temporary storage. It takes place in blast chillers and freezers. It is a storage of shell stock from growing areas in the approved classification in containers or floats in natural bodies of seawater (near shore sights) or intense containing natural or synthetic seawater (on shore system).

Wet Storage of vegetables in fridge

Wet storage of frozen food in freezer

3.2.1 Food Labeling

Food labeling is a method of any written, printed or graphic matter that is present on the label, accompanies the food, or is displayed near the food. The purpose of food labeling is making the food safe, promoting its sale or disposal. The food labeling system is an important communication tool that provides all information about any product's compositions, nutritional profile and quantity of contents to the consumers. It is easy to understand each and every aspect which is required for the customer satisfaction. When labeling food product four methods are used:

Do you know?

Common food allergens are milk, eggs and nuts (fats and proteins).

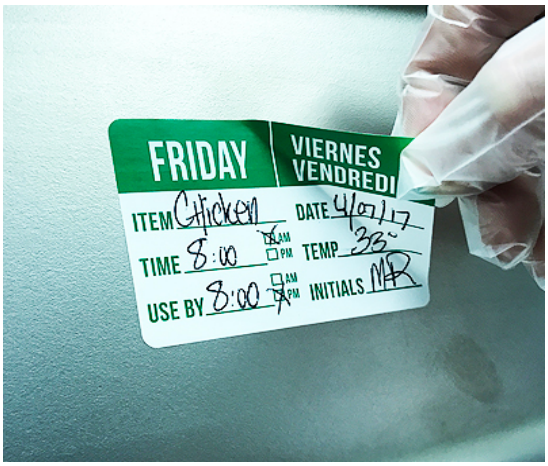
1. Best before means the product has some storage life left but may be inferior in taste.

Best before label

2. Use by date means the product must be used by that date otherwise will consider expired.
3. Color coded tags are used in food labeling system which can be visible immediately and we can easily identify which item should be used first.

Color coded tags

4. Automated labeling system is used e.g. barcodes which can be read quickly with the help of scanner.



Food label

Interesting Information!

Food labeling reflects product manufacturing date, expiry date, ingredient list, nutrition facts, storage conditions and daily value are all mentioned.

Note: Nutritional facts in labeling system include calories, fats, salts, carbohydrates and proteins.

3.2.2 Food storage instructions

Some basic food storage instructions which are very important for the safe and hygienic food are as follows.

- Check and observe the use by dates on every food product in chillers
- Practice safe selection of food items
- Store fresh products in chillers at 1˚C to 4˚C
- Avoid cross contamination in chillers
- Minimize danger zone in chillers and deep freezers
- Store, cook and serve food at their specific temperatures
- Keep hot, cold cooked, uncooked, wrap and unwrap food separately.
- Keep dairy and meat separately in different stations.

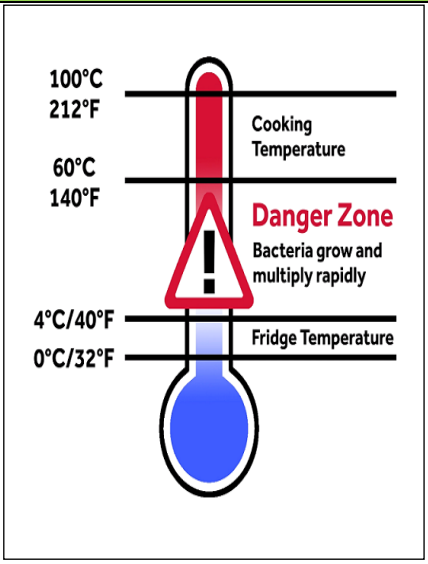
- Thaw frozen food safely in chiller
- Handle and store leftovers with care
- Transport your food safely at correct temperatures

Activity: Arrange the students into 4 groups, each group has to categorize and arrange wet and dry storage items separately by using rule of FIFO.

Do you know?
FIFO means **First in First out**.
LIFO means **Last in First out**.
GIGO means **Garbage in Garbage out**.

3.2.3 Danger zone for food

Danger Zone is the temperature zone in which microorganisms can grow fast the range of Danger Zone is 5°C and 60°C. This is the range where pathogenic bacteria growth thrives and most active at 37C.



3.2.4 Food Preservation Methods

Food preservation is the technique to keep the food store and healthy for a long time. It slows down the growth to bacteria in the food and prevents the food borne. Basic food preservation methods include drying, refrigeration and fermentation. Modern methods include canning, pasteurization and freezing.

Canning, pasteurization and freezing

The processing procedures for fruits and vegetables include:

1. Blanching
2. Dehydrating
3. Canning
4. Freezing
5. Pickling

Blanching:

In blanching cream washed vegetables heat in hot water at 88C for 2-5 minutes. It inactivates enzymes that cause discoloration, off-flavors and aromas. After blanching, vegetables must dip in cold water. Examples includes blanching to tomatoes, asparagus etc.

Blanching of tomatoes-Step 1

Blanching of tomatoes-Step 2

Dehydrating:

Dehydrating of food is the process through which food can be preserved for indefinite period by extracting the moisture.

Dehydrating in various fruits and vegetables

Canning:

Canning is the process in which fruits and vegetables are sealed in airtight tin and then can sterilize the tin. Examples includes pineapple tin, strawberry tins and tomato puree etc.

Canning of fruits and vegetables

Freezing:

Freezing is the shortest, easy and less time-consuming method. Freezing delay spoilage and reduce the activity of microorganisms. Examples includes freezing of strawberry, berries and corns.

Freezing of strawberry and berries

Pickling:

Pickling is the process in which vegetables and fruits stored by adding preservatives like salt, sugar, vinegar and other products.

Examples include pickles of mixed vegetables etc.

Activity!

Arrange the class into small groups; each group will be assigned the task to preserve vegetables and fruits by using any of the food preservation methods.

3.2.5 Heat Treatment Processes

All microorganisms need 37C temperate, oxygen, food, 6.8 pH for growth. By altering the conditions, microorganisms are unable to grow well.

Heat treatment processes includes:

- Canning- Food is cooked in liquid in a seal container, so bacteria and viruses cannot grow.
- UHT is also known as ultra-heat treatment in which rapidly heating liquids to 140C for 1-2 seconds, then rapidly cool and place in sterile, airtight containers. It can last more than 6 months if unopened.
- Pasteurization included heating milk at 71C for 15-20 mins to kill bacteria.
- Boiling will kill bacteria at 100C and prolongs shelf life of foods.

Do you know!

Food preservation methods help to increase taste of food and its shelf life.

UHT & pasturized milk

3.2.6 Factors of food contamination

Factors of food contamination include:

- Not following food hygiene procedures
- Not washing and sanitizing hands between tasks
- Ignoring SOP's
- Negligence in Personal protective equipment
- Incorrect storage temperatures
- Food kept in danger zone for longer time
- Cutting different foods with same cutting board

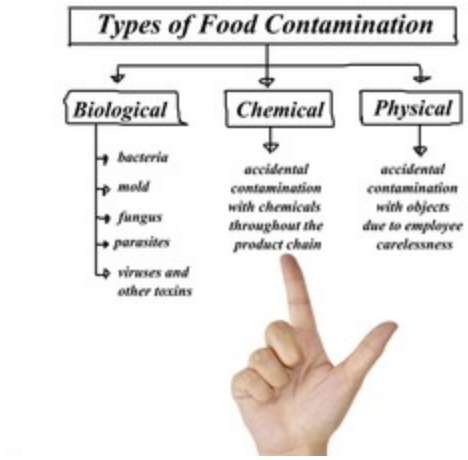
Interesting Information!

In professional kitchen, 5 basic colors coded chopping boards are used for the prevention of cross contamination.

1. Red –meat
2. Sky blue – seafood
3. Yellow – poultry
4. Green – Fruits & Vegetables
5. White – Dairy/bakery products.

3.2.7 Standard procedures to avoid contaminations Food Contamination

Food contamination is defined as presence of harmful microorganisms (bacteria, viruses) as you read in previous topic 3.1.3



Key steps for prevention of contamination include:

- Follow hand washing and hygienic procedures
- Follow weekly and monthly cleaning schedules
- Use of color-coded chopping boards
- Apply the use of principle "clean as you go"

- Store the food at correct temperatures
- Use Personal Protective Equipment (PPE)
- Maintain workplace hygiene
- Avoid cross contamination of food in workplace

Do you know!

Storage temperatures of different foods

- Frozen meat below -18˚C
- Fresh seafood 0C to 2˚C
- Frozen seafood 0C to -2˚C
- Fruits and vegetables 1˚C to 7˚C

Handling Food Wastage

How to handle different type of food wastage?

Handling food wastage

All kitchen gathers garbage during the preparation of food. Garbage should be place in designated bins, covered from top, foot operated and easy to clean.

3.2.8 Risks and Hazards associated with garbage and wastage

> **Do you know!**
>
> Contaminated food can cause long term health problems and food borne illness.

Hazards associated with solid waste management include occupational risks, physical risks, chemical risks, ergonomic risks and biological risks. These risks generate materials that are toxic, reactive, ignitable, corrosive, infectious or radioactive.

Toxic waste and garbage's are all poisons even in very small or trace amounts. Direct handling of solid waste can be very dangerous, infectious and chronic diseases.

3.2.9 Waste Management

Standard operating procedure of waste management according to hygiene includes:

- Put on gloves
- Seal the bin linen
- Remove garbage
- Wash and scrub bin
- Wash surrounding area- floor and walls
- Rinse out bin with hot water
- Sanitize bin
- Perform Air drying
- Reline bin with plastic cover
- Remove gloves and wash hands thoroughly

3.2.10 Garbage handling and safe disposal

As you learn in previous topic, garbage handling and safe disposal is very important in terms of hazards, risks and hygiene. It is important to handle garbage with PPE and clean bins according to 6 stage cleaning methods.

Some kind of environmental contaminants can also spread serious illness and diseases if not disposed of in the right way. Proper waste management and disposal removes all

these hazardous materials from the environment it is saved for both. It is safe for both human beings and animals.

Common types of kitchen wastage that we can handle in kitchen are as follows

1. All type of food waste (organic waste)
2. Plastic waste
3. Glass waste
4. Cardboard from packaging waste
5. Hazardous items
6. Chemical waste
7. Liquid waste
8. Bakery waste
9. Catering waste
10. Paper waste

Some basic rules for effective waste disposal are:

- Remove food scraps from the kitchen daily or more effectively if required
- Arrange the regular garbage collection. Most food businesses require garbage collection at least twice a week.
- Keep the garbage containers clean. Move overflowing of waste into the other container.
- Don’t allow garbage to overflow in bins
- Use the bins which can be handled from the feet. Keep lids tightly closed of bins.
- Use special containers for the disposal of the dangerous and hazardous items.

Keep every type of garbage separate for example paper and plastic can be recycled or reuse. Some food items like bread can be used in any other dish and as bread crumbs. Organic waste can be disposed safely into the sandy area because it works as the nutrients rich fertilizers for the plants.

Different types of garbage and waste

Comprehend garbage handling and safe disposal

Key Points

- Food safety system is a system to safe the food and control of different food hazards at every stage of food preparation, production and storage of food that prevent food borne illness. Food safety is also known as Food Hygiene.

- Dry storage is a type of storage in which dry ingredients are stored at ambient temperatures. In dry storage, we store dry ingredients such as cereals, flours, rice, dry pastas, fruits, vegetables, tined products and canned products.

- **Food poisoning** is defined as consumption of contaminated food by a person, which results in health problems. Common indicators of food poisoning are diarrhea and vomiting.

- **Contamination** is defined as presence of bacteria, viruses and toxins in food. Contamination is of three types' physical contamination, biological contamination and chemical contamination.

- All microorganisms need 37C temperate, oxygen, food, 6.8 pH for growth. By altering the conditions, microorganisms are unable to grow well.

- Heat treatment food preservation methods include pasteurization, boiling, UHT and canning.

- All kitchen gathers garbage during the preparation of food. Garbage should be place in designated bins, covered from top, foot operated and easy to clean.

Exercise

Mark to correct options

1. The common symptoms of food poisoning is
   a. Fever
   b. Weakness
   c. Flu
   d. Vomiting
2. MSDS sheets stand for
   a. Material safety data sheet
   b. Material storage data sheet
   c. Maximum storage data sheet
   d. None of these
3. Which type of contamination is the presence of hair in ready to eat food
   a. Physical
   b. Chemical
   c. Biological
   d. Food allergen
4. Common food allergens are
   a. Vegetable and fruit
   b. Bread and butter
   c. Milk and nuts
   d. Jam and jelly

Give short answers

1. Why food safety procedures are used infood operation?
2. Define food labeling.
3. What is the purpose of food preservation?
4. Enlist types of color coded cutting boards?
5. Which types of bins are used for kitchen operations?

Answer the following question in detail.

1. Describe the standard procedures to avoid cross contamination?
2. Explain the food preservation methods?
3. Explain the washing procedure of bins by using 6 stage cleaning method?

Activities

1. Arrange the class into small groups; assign the task of storing food according to requirements mentioned below.
   - Temperature
   - Humidity
   - Date of production (FIFO)
2. Perform cleaning of garbage bins and changing garbage liners.

Note for teachers

1. Demonstrate the students about standard operating procedures to avoid food contamination during food operations. He/she is required to familiarize the students about food labeling systems.
2. Guide students about the garbage handling procedures. He/she must also monitor that students are cleaning garbage bins properly.

Chapter 4:

Hazard Analysis Critical Control Point (HACCP)

Student's Learning Outcomes

After completing this chapter, you will be able to

- define food safety systems
- understand concept of FATTOM
- define HACCP (Hazard Analysis Critical Control Point)
- identify hazardous foods
- understand the seven principles of HACCP

4.1.1Food Safety System

Food safety system is a professional approach to control food safety hazards in a growing food industry in order to ensure that the food delivered to customers is safe, healthy and hygienic.

FSMS (Food Safety Management System) is based on the principles of HACCP.

Food Safety Steps

Food Safety is a method which describes how to handle, prepare and store food in different ways to prevent food borne illness.

For example:

Uncooked food can transfer bacteria to cooked food. Hence, we use color coded chopping boards to prevent food borne illness.

Causes of food spoilage

1. High protein and fat
2. Time and temperature
3. Presence of oxygen
4. Moisture

4.1.2 FATTOM

FATTOM is an acronym for Food, Acidity, Time, Temperature, Oxygen and Moisture. FATTOM is a term used to describe the conditions which are necessary for the bacterial growth.

Food provides a favorable environment for bacterial growth because of presence of nutrients and moisture.

In simple words FATTOM identify the

Do you know!

More than 200 diseases can spread through food.

favorable conditions for bacterial growth. In kitchen, we can only control Time and Temperature to avoid bacterial growth.

4.2 Introduction of HACCP

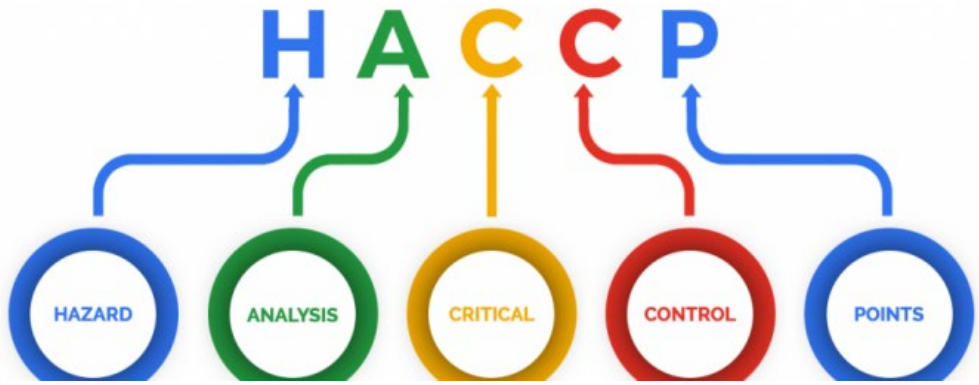
4.2.1 Define HACCP

HACCP stands for Hazard Analysis Critical Control Points. Hazard Analysis Critical Control Point (HACCP) is a system that originated in the USA to prevent food poisoning of astronauts whilst in space.

HACCP is crucial in bulk catering as large batch production could lead to poisoning of a big pool of clients. To minimize the risk of food contamination, you need to consider all the steps involve in food preparation and sales.

Do you know!

HACCP is the concept that's been around since 1950's in NASA.



Abbreviation of HACCP

4.2.2 Hazardous Foods

Hazardous food are the foods that provide favorable conditions for bacterial growth. Microorganisms need moisture, temperature, acidity, time and oxygen to grow. Hazardous foods need to be handled and stored correctly.

Examples of hazardous foods:

- Raw and cooked meat
- Processed meat products e.g. sausages and meatloaf
- Dairy products such as milk, cheese and custard
- Seafood (live seafood is not included)
- Processed Fruits and vegetables e.g. salads
- Cooked Rice and pasta
- High protein food items such as eggs, beans, nutsetc.

4.2.3 Principles of HACCP

HACCP is a widely used food safety procedure which emphasizes on preventing food hazards during and after food production. There are seven principles of HACCP mentioned below:

Interesting Information!

In 1950's, the team of National Aeronautics and Space Administration (NASA). The Pillsbury company, and the Natick research laboratories came together to work on a project named HACCP to minimize food risk in space for astronauts.

Principle 1. Hazard Analysis (identification of hazards)

Principle 2. Critical Control Point (steps essential to prevent food safety hazards)

Principle 3. Critical limits (assigning limits to CCP)

Principle 4. Monitoring and Sampling (Compliance of critical limits)

Principle 5. Corrective Action (actions taken in case of breech in critical limits)

Principle 6. Verification (All steps are aligned with SOP's)

Principle 7. Record Keeping (record of SOP's, routine checks, incidents)

Seven Principles of HACCP

The Seven HACCP Principles

Principle 1: Conducting a hazard analysis. During this phase, plants determine the hazards tampering food safety; identify the preventive measures to control these hazards.

Principle 2: Identifying critical control points. A critical control point (CCP) is a point in a food production process in which control is applied to prevent, eliminate, or reduce food safety hazard to an acceptable level.

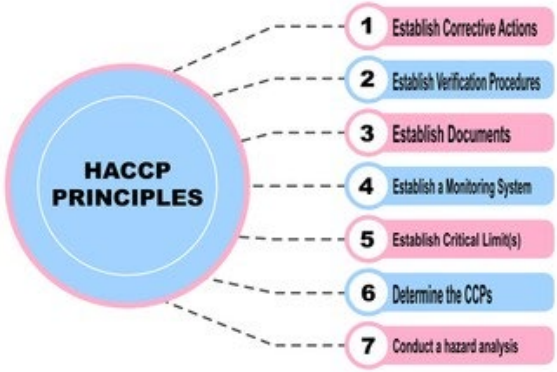
Principle 3: Establish critical limits for each critical control point. A critical limit is a specific value to which a physical, biological, or chemical hazard must be controlled. CCP separates safe food from unsafe food and also prevent, eliminate, or reduce hazard to an acceptable level. Notably, critical limits are usually numerical values based on scientific finding.

Principle 4: Establish critical control point monitoring requirements. Monitoring of the food production process is mandatory to make sure that the process is under control at each critical control point and hazards are also in control. The process of monitoring includes temperature checks, visual inspection, time recording etc. As per the FSIS requirement, monitoring of each process is mandatory and frequency of monitoring has to be listed in the HACCP plan.

Principle 5: Establish corrective actions. In case of identifying deviation in the monitoring phase, corrective actions are to be taken to prevent the hazard. Corrective actions ensure that adulterated product injurious to health does not enter markets.

Principle 6: Establish record keeping procedures. As per the HACCP regulations, all plants are required to keep documents including hazard analysis, monitoring of CCP, critical limits and the checking process deviations.

Principle 7: Establish verification procedures. Verification can determine the validity of the HACCP plan and find out whether the system is operating in accordance with the plan.



On one hand, verification evaluates whether the facility's HACCP system is functioning according to the HACCP plan and on the other, it validates the HACCP plan to determine that the plan is scientifically and technically sound. Also the initial validation of the process ensure that all hazards have been recognized and assures that if the HACCP plan is correctly applied these hazards will be successfully restricted.

Key points

- Food Safety is a method which describes that how to handle, prepare and storage of food in different ways which prevent food borne illness.

- FATTOM stands for food, acidity, time, temperature, oxygen and moisture. These factors provide favorable conditions for pathogens to produce food borne illnesses.

- Hazard Analysis Critical Control Point (HACCP) is a system that originated in the USA to prevent food poisoning of astronauts whilst in space.

- The food which is dangerous for health is called hazardous food. In short dangerous food is known as hazardous food.

- Seven principles of HACCP include Hazard analysis, critical control point, critical limits, monitoring and sampling, corrective action, record keeping and verification.

Exercise

Mark the correct option

1. Chemicals should be stored:
   a. Near workstations
   b. Near food storage rooms
   c. In a lockable room away from production area
   d. Near chef office

2. Which are the most important aspects of food safety?
   a. Time and temperature
   b. Nitrogen and sodium
   c. Taste and flavor
   d. Color and weight
3. Which one of the following food is comparatively more hazardous?
   a. Chicken sandwich
   b. Bread
   c. Tea
   d. Coffee
4. Which one of the following is not a principle of HACCP?
   a. Critical control point
   b. Critical limit
   c. Prevention from contamination
   d. verification

Give short answers

1. Why these food items are hazardous?
   a. Beef steak burger b. custard c. cold club sandwich
2. What does FATTOM stands for?
3. What does HACCP stands for?
4. What is the origin of HACCP?

Answer the long questions

1. What is hazardous food, explain with examples?
2. Define HACCP, explain its principles and practical implementation?

Activity

1. Arrange the class into small groups; make flow charts on HACCP.
2. Visit any nearest commercial kitchen and identify food safety hazards.

Teacher guide

- The teacher is required to explain the principles of HACCP with examples.
- The teacher is required to explain the term FATTOM and its role in food safety.

Chapter 5: Vegetables, greens and fruits

Students learning outcomes

After completing this chapter, you will be able to

- know about types and categories of fruits, vegetables and greens
- recognize various categories of vegetables and its uses
- learn the processing techniques of fruits, vegetables and greens
- know requirement for cooking complex vegetable dishes
- learn different methods of cooking vegetables and greens
- follow appropriate methods to cook vegetables and fruit dishes
- recognize tools and equipment to cook complex vegetable dishes correctly
- serve vegetable and fruit dish to meet recipe standards
- understand correct temperature for holding and serving

5.1 Types and categories of Fruits, Vegetables and Greens

Do you know about fruits, vegetables and greens?

Vegetables are the plant or a part of plant which is consumed as food in many dishes such as cabbage, potato and turnip. Greens are leafy vegetables, salad greens and herbs used as food. Greens are the excellent sources of vitamin A, vitamin C, vitamin K, iron, magnesium and calcium.

Fruit is a fresh sweet product of any tree and plant that contains seed and consume as food such as apples, tomatoes, mango, peaches etc.

Vegetables, Greens and Fruits

5.1.1 Types and categories of Fruits, vegetables and greens

There are many types and categories of vegetables, greens and fruits are there according to their specifications and nature.

Types and categories of Vegetables

I. Leafy Green Vegetables

The examples of leafy green vegetables are Lettuce, Ice berg, green leaf, red leaf, Spinach etc.

II. Flowers Vegetables

The examples are Cabbage, red cabbage, cauliflower, broccoli, Brussels sprouts etc.

III. Marrow Vegetables

There are two categories of Marrow Vegetables one is Soft - Shell Squash and other is Hard Shell Squash. The examples of soft-shell squash are Cucumber, Zucchini, purple eggplant, white eggplant etc. The examples of hard-shell squash are Pumpkin, carnival, sweet dumpling, butternut squash etc.

IV. Roots vegetables

The examples are Radish, carrot, baby white turnips, red beets, baby beets, large red beet, white turnips etc.

V. Tubers and rhizomes

The examples are red potato, yellow potatoes, ginger, galangal, sweet potatoes etc.

VI. Shoots and stalks

The examples are celery, asparagus, white asparagus, fennel etc

VII. Bulk vegetables

The examples are Onion, Garlic, Green onions, leek, Spanish onion etc.

Types and categories of greens

Leafy greens are an important part of well-balanced diet. These are enriched with vitamins and minerals that give multiple health benefits to our bodies. The following types of greens are:

Kale	Arugula
	
Bok choy	Spanish
	
Cabbage	Romaine lettuce
	

Watercress	Mustard greens
	
Turnip greens	Broccoli rabe

Types and categories of fruits:

There are basic 6 categories of fruits which include:

1. Berries

   Berries such as blackberries, Cranberries, blueberries, red &black raspberries, strawberries and grapes etc.

2. Pits

   These types of fruits contain a hard, single stone which contains a seed. The examples include cherries, apricots, nectarines, peaches, and plums.

3. Core

   These types of fruit contain central seed surroundings by a thick layer

of flesh. The examples include apples and pearls.

4. Citrus fruits

   These types of fruits contain a thin membrane which separates the flesh into segments. The example includes oranges, grape fruit and lemons.

5. Melons

   These types of fruits contain a large, Juicy fruit with thick skin and many seeds such as honeydew and watermelon.

6. Tropical fruits

   These types of fruits grow in a warm climate and available throughout the world. Examples include coconuts, avocados, bananas, figs, dates, mangoes and pineapples.

5.1.2 Recognize various categories of vegetables and its uses

Activity: Identify various categories of vegetables which are given below individually and demonstrate the uses of them.

Uses of various types of vegetables:

- Vegetables are normally low in fats
- Vegetables are the important source of dietary fiber, folate and vitamins.
- Vegetables are mostly use in lunch as salad
- It also uses in production of different sauces and stocks.
- It uses in production of snacks as main ingredients.

Do you know!

People, who eat 5 vegetables servings in a day, they have minimum risk of cancer and heart diseases.

5.1.3 Processing techniques of fruits

The processing procedures for fruits and vegetables include:

- Blanching
- Dehydrating
- Canning
- Freezing
- Pickling
- Sugar preservation

Blanching:

In blanching cream washed vegetables heat in hot water at 88C for 2-5 minutes. It inactivates enzymes that cause discoloration, off-flavors and aromas. After blanching, vegetables must dip in cold water. Examples includes blanching to tomatoes, asparagus etc.

Blanching of tomatoes-Step 1

Blanching of tomatoes-Step 2

Dehydrating:

Dehydrating of food is the process through which food can be preserved for indefinite period by extracting the moisture.

Dehydrating in various fruits and vegetables

Canning:

Canning is the process in which fruits and vegetables are sealed in airtight tin and then can sterilize the tin. Examples includes pineapple tin, strawberry tins and tomato puree etc.

Canning of fruits and vegetables

Freezing:

Freezing is the shortest, easy and less time-consuming method. Freezing delay spoilage and reduce the activity of microorganisms. Examples includes freezing of strawberry, berries and corns.

Freezing of strawberry and berries

Pickling:

Pickling is the process in which vegetables and fruits stored by adding preservatives like salt, sugar, vinegar and other products.

Examples include pickles of mixed vegetables etc.

Picking of vegetables and fruits

5.2 Processing, Cooking and Storing

5.2.1 Requirement for cooking complex vegetable dishes

The basic requirement for cooking complex dishes includes

- Select the type of vegetable which you are needed to cook
- Check the quality and quantity of vegetable and make sure that the vegetables and fruits which are used according to the good quality as per standard.

- Use the utensils and correct tool to cook and finish the cooking procedure of vegetables
- Use the equipment and tools correctly
- Mix the vegetables with other ingredients
- Now cook the vegetables and all the ingredients to meet the requirements of the dish
- Ensure that the dish has the correct flavor, quantity, color and consistency
- Garnish the dish according to the nature of dish
- Ensure that the dish is on its correct temperature for holding and serving.

5.2.2 Different methods for cooking vegetables and greens

Methods for cooking vegetables and greens

Different methods for cooking vegetables and greens are as follows:

1) Raw vegetables & greens
2) Boiling vegetables
3) Steaming vegetables
4) Sautéing vegetables
5) Stir fry
6) Braising and stewing
7) Roasting and baking
8) Frying
9) Marinating
10) Quick pickling
11) Grilling

Important note!

Common culinary terms which are used for vegetables are boiling, deep frying, roasting and grilling.

Stir fry of vegetables & greens

boiling of vegetables & greens

Name of dish	Sautéed Spanish	**Preparation time:**	15 mins
Number of portions:	4	**Size of unit:**	1
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 10 mins**
Spanish	450 gm.	Washed	
Olive oil	15 gm.		
Sliced garlic	3 no.		
Salt	As per taste		

Method

1. Clean and cut the thick stems of spinach
2. Soak in water to loss any dust
3. Drain the Spanish and repeat this process
4. Add oil in sauce pan and sauté garlic in it, until it turns brown
5. Add salt &Spanish and cook well for 5 mins
6. Remove from heat and serve

Sautéed Spanish

Name of dish	Steamed vegetable salad	**Preparation time:**	30 mins
Number of portions:	4	**Size of unit:**	1
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 10 mins**
Cauliflower	50 gm.		
Broccoli	50 gm.		
Carrot	100 gm.		
Apple	100 gm.		
Beat root	50 gm.		
Olive oil	20 ml.		
Lemon juice	5 ml.		
Salt	As per taste		

Method:

1. Wash all the vegetables
2. Cut the cauliflower, broccoli into cubes
3. Steam these vegetables until soft
4. Cut the carrot, apple, beat root into cubes
5. Combine all the fruits and vegetables
6. Add olive oil in it
7. Add salt and mix all the ingredients together.

Steamed vegetable salad

Name of dish	Finger chips	**Preparation time:**	60 mins
Number of portions:	4	**Size of unit:**	1
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 10 mins**
Potato	250 gm.		
Salt	As required		
Oil	For frying		

Method:

1. Wash and peel the potatoes
2. Cut potatoes in sticks and pour them into cold water for 30 mins
3. Remove from water and dry them
4. Dry with towel
5. Blanch them into oil for 3 mins on medium flame
6. Dry them with paper towel
7. Deep fry them again on medium heat.

French fries

Name of dish	Mix Vegetable rice	**Preparation time:**	60 mins
Number of portions:	4	**Size of unit:**	1
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 20 mins**
Potato	100 gm.		
Peas	50 gm.		
Carrots	100 gm.		

Salt	As per required		
Cumin seeds	5 gm.		
Oil	500 gm.		
Ginger	5 gm.		
Onion	1 large		
Red chilli	8 gm.		

Method:

1. Wash, peel and rewash vegetables
2. Cut potato and carrots in cubes
3. Wash and soak rice into water for 20 mins
4. Fry the onion into golden brown and add jillion cut ginger in it
5. Add vegetables and water and cook them until tender
6. Add rice and water in it and boil it until tender on medium flame
7. Dries the water and slow down the heat and keep it for 5 mins.
8. Serve it hot.

Mix vegetable rice

5.2.3 Methods for cook vegetables and fruit dishes

Appropriate methods for cooking vegetables are already mentioned in above topic 5.2.1

Appropriate methods for cooking Fruits

The appropriate methods for cooking fruits include:

1) Poaching
2) Stewing
3) Sauces
4) Compotes (fruits cooked in sugar syrup with different types of spices)
5) Grilling
6) Broiling
7) Roasting
8) Baking

The examples of fruits which are used in these methods are pears, apples, peaches, plums, apricots, figs, grapes and bananas.

Strawberry compote

Sauce made from fruit

5.2.4Tools and equipment to cook complex vegetables dishes correctly

Tools and equipment which are used in the cooking of complex vegetable dishes are following

	
Chef Knife	Green cutting boards for vegetables
	
Ladle	Mortal and pastel

	
Cutlery	Grill pans
	
Pots and pans	Weighing scale
	
Chopper and grinders	Cooking utensils
	
Serving crockery	Measuring tools

Other miscellaneous tools include:

- Strainers
- Cutting boards
- Tongs
- Cooking pots
- Pans
- Woks
- Pressure cooker
- Bowls
- Ladles
- Soup spoons
- Food processors
- Steamers

5.3 Serving

Activity: Arrange the class into 5 groups, each group made different vegetables and fruit dishes to meet recipe standards and serve them according to standard portion size.

5.3.1 Temperature for holding and serving

Fruits and vegetables	Holding temperatures	Serving temperatures
Okra bhujiya	80 ˚C	70 ˚C
Potato bhujiya	85 ˚C	70 ˚C
Chicken and vegetable noodles	80 ˚C	70 ˚C
Fruit salads	2 ˚C	4 ˚C
Russian salad	2 ˚C	4 ˚C
Strawberry compote	-18 ˚C	3 ˚C
Mango mousse	1 ˚C	4 ˚C
Banana pudding	3 ˚C	4 ˚C

Key points

- Vegetables are the plant or a part of plant which is consumed as food in many dishes such as cabbage, potato and turnip. Greens are leafy vegetables, salad greens and herbs used as food.
- Greens are the excellent sources of vitamin A, vitamin C, vitamin K, iron, magnesium and calcium.
- Fruit is a fresh sweet product of any tree and plant that contains seed and consume as food such as apples, tomatoes, mango, peaches etc.
- The processing technique of fruits and vegetable includes blanching, dehydrating, canning, freezing, pickling and sugar preservation.
- The tools & equipment used in cooking of complex vegetable dishes include wok, pan, spatula, pressure cooker, tongs, cutting boards, strainers and knifes etc.

Exercise

Mark the correct option

1. Corn is a vegetable
   a. Seed vegetable
   b. Root vegetable
   c. Tuberous vegetable
   d. None of these
2. Tomato is categorized in
   a. Vegetable
   b. Fruit
   c. Greens
   d. None of these
3. Which is the best method of cooking the vegetables to keep them more healthy
   a. Boiling
   b. Sautéing
   c. Steaming
   d. Stewing
4. The serving temperature of fruit trifle pudding is
   a. 5˚C
   b. 8 ˚C
   c. 15 ˚C
   d. 35 ˚C

Give short answers

1. Enlist types and categories of vegetables and greens?
2. What is the correct serving temperature of Vegetable dish?
3. Enlist the cooking methods of fruits?
4. Describe tools & equipment used for preparation of vegetable rice?

Answer the following question in detail.

1. Describe the types & categories of fruits, vegetables and greens?
2. Write down the serving temperatures of cooked vegetable dishes?

Activities

1. Arrange the class into 5 groups, give them a task to prepare, cook and finish complex vegetable dishes and present to teacher.
2. Prepare, cook and finish two types of puddings and decorate and serve according to modern culinary techniques.

Teacher guide

1. The teacher is required to teach and recognize the students about different types of fruits, vegetable and greens. Also guide them how to produce different dishes by using different cooking methods.
2. The teacher is required to teach them how to decorate, garnish and serve different vegetable and fruit dishes. He /she also guides them about the portion sizes for serving.

Chapter 6: Dairy and eggs

Students learning outcomes:

After completing this chapter, you will be able to

- understand the categories of dairy products
- know about fermentation and cheese making process
- understand special attributes of dairy products and its specifications
- understand special attributes of eggs in cooking and baking
- understand use of eggs for making different dishes
- use tool and equipment to make dairy products correctly
- learn different methods to prepare dairy products
- make different dishes from dairy products
- identify contaminated egg and dairy
- learn about contaminants present in eggs and dairy dishes
- understand handling and storage of eggs and dairy based foods

6.1 Dairy

What do you know about dairy products?

Dairy products are the type of foods which are produced from the milk of mammals such as buffalo, goat, sheep and camels. Dairy products are also known as milk products. It includes food items such as yogurt, cheese, butter etc. It does not include food made from milk but have little calcium and a high fat content such as sour cream, cream cheese etc.

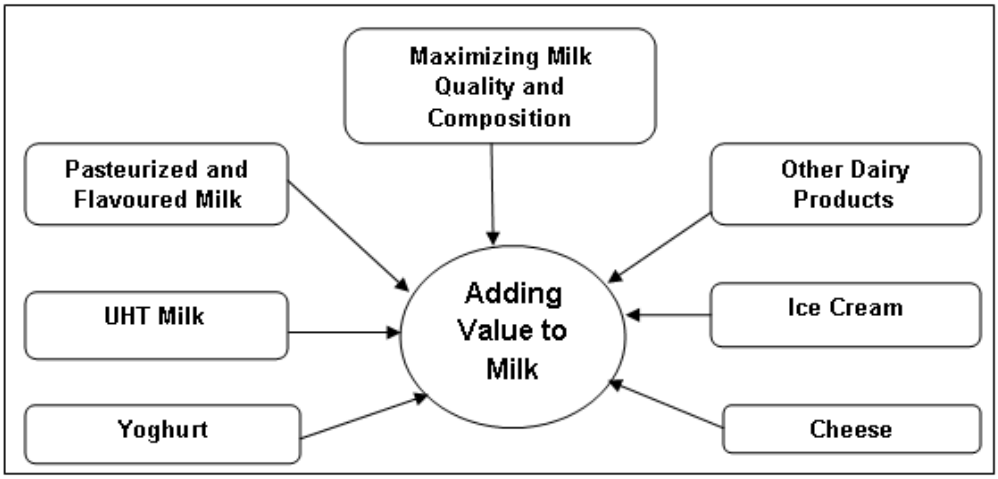
6.1.1 Understand the categories of Dairy products

Dairy Products or milk products isa type of food which are made up of milk and containing the milk of mammals (Cattle, water buffaloes, goats, sheep, camels etc.)

The following Categories of dairy products areas below:

	
Milk	Yogurt
	
Cream	Butter

	
Cheese	Curd



Categories of Dairy Products

6.1.2 Fermentation process and cheese making

Fermentation process is a chemical process that produces different chemical changes in organic substances (sugar) and breaks down into simpler substances through the action on enzymes.

Microorganisms like yeast and bacteria usually are two components which play basic role in the process of fermentation.

Some products which are made up by the process of fermentation are

- Bread
- Yogurt
- Cheese

The process of fermentation can finish many harmful microorganisms and harmful chemicals from food and adds beneficial bacteria in food. These bacteria produce new enzymes into the food which is beneficial in digestion.

Common Fermented Foods

Cheese Making

Basic steps of cheese making process are listed below:

- Perform preparing the milk for cheese making. (Fresh and warm milk)
- Add culture (lemon juice/vinegar) to the milk
- Add a coagulant (Curdling the milk)
- Separate the solids from the solids
- Processing the Curd
- DrainWhey
- Mould the cheese
- Add salt into the cheese according to the type of cheese
- Aging the process

Activity : Prepare, cook and finish cottage cheese.

Do you know?

How does a bucket of milk become cheese?

There are two types of proteins, which are present in the milk in huge amount. These proteins are Casein and Whey. Splitting of milk happens because of presence of bacteria in the milk and the more the milk grow older, the chances of its splitting increases.

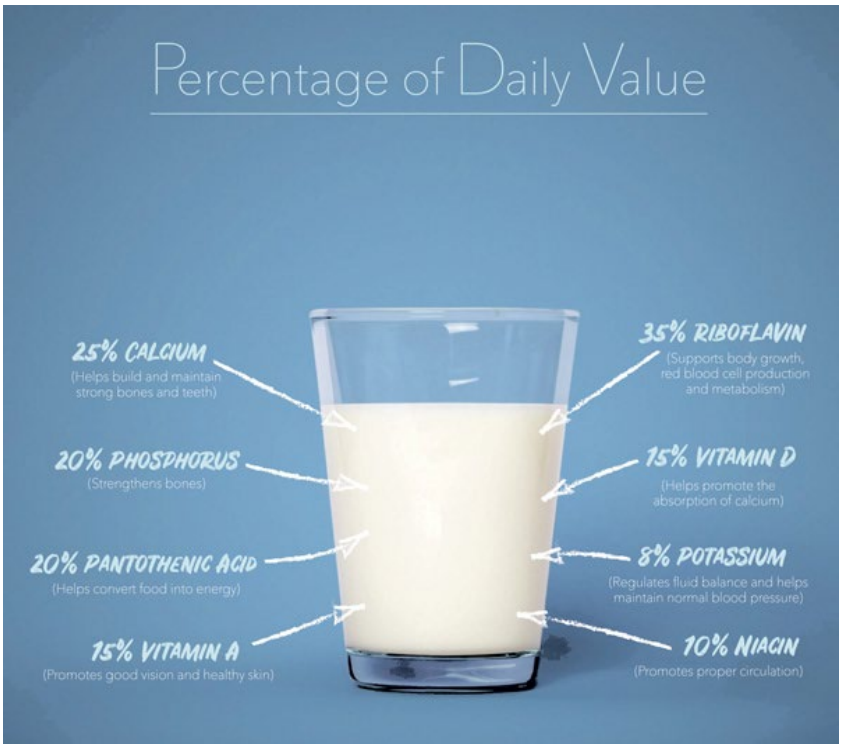
6.1.3 Attributes of dairy products and its specification

Attributes of dairy products:

Milk is a nutrient/rich liquid food processed by mammals. Protein and lactose are 2 major nutrients which are present in milk. Milk is a key ingredient in most kitchens, whether it is serves as a beverage or used as a component in many dishes on national and international levels. The type milk includes:

- Whole milk (3.25% milk fat)
- Reduce fat milk (2%)
- Low fat milk (1 %)
- Fat free milk (skimmed milk)

Cream: The pale yellow or thick white fatty liquid which arise to the top when milk is left to stand and which can be eaten as an accompaniment to desserts or used as a cooking ingredient. Cream contains 35% of fat content.



Nutritional value of milk

6.2 Eggs

An oval or round object laid by female animals like hens, ducks, and fishes etc. Egg consists of 2 edible different parts; one is egg white and other is egg yolk.

6.2.1 Special attributes of eggs in cooking and baking

Attributes of Eggs

Eggs play an important role in cooking and baking both. They create structure and stability to a batter in baking and it emulsify sauces, give a new texture to different dishes in cooking. The attributes of fresh eggs include:

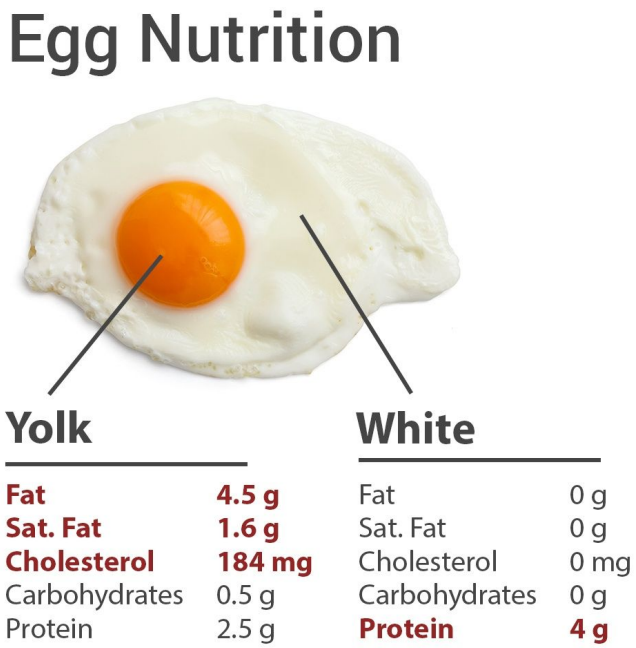
- Egg are enrich in nutrients
- Egg yolk contains high amount of proteins
- Eggs improves the level of healthy fats
- Egg is a great source of vitamin D
- Eggs is beneficial in weight management

In baking eggs have a number of functions in production of pastries, cakes, sponge, biscuits, cookies and in yeast goods which includes

- The water content of eggs will help to bind the dry ingredients together.
- When eggs beat and produce air bubbles which will aerate the product.
- The protein content in eggs provide structure in product
- Eggs improve crust color of biscuits and cakes.
- Emulsification of eggs enhances quality and stability of bakery products.
- Eggs keep baked items more delicate and softer.
- Eggs add texture and fluffiness in baking items.
- When eggs are whisked, they add air into the product.
- In baking the most important role of eggs is that they improve the crust color.

Shell	Egg yolk	Egg white
10% of total weight	30 % of total weight Water 50% Fat 33% Protein 17%	60% of total weight Water 88% Protein 12%

In cooking, eggs have five functions such as binding agent, thickening agent, coating agent, leavening agent and emulsifying agent.



Nutrients in egg

6.2.2 Use of eggs for making different dishes

Eggs act as binding agent in making different dishes. Protein part of eggs helps in binding ingredients together and giving strength and stability to different dishes. Eggs are also used in coating of snacks with flour and crumbs.

Do you know!

Emulsification is a process used for combination of oil and water.

When egg white is beaten bubbles are formed and act as leavening agents of such products as omelet's, soufflés, cakes and meringues.

Eggs are used to create stable emulsions in mayonnaise, ice creams and cream puffs. Raw eggs can also add in different drinks. It functions as thickening agents in custards and puddings.

6.3 Processing and cooking

Cooking is the process of preparation food by combining, mixing, beating and heating ingredients.

The different eggs dishes are described below with all the processing and cooking methods:

Name of dish	Boiled egg	**Preparation time:**	5 mins
Number of portions:	1	**Size of unit:**	1
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 8 mins**
Egg	1.		
Water	As required		
Salt	1 pinch		

Method:

1. Place the egg in saucepan
2. Fill the pan with cold water, 1 inch above egg
3. Bring it to boil
4. Boil the egg on 100℃ for 6 to 8 mins
5. Fill the large bowl with ice and water
6. Dip the boiled egg in it
7. Cool it for 10 mins
8. Remove the shell and serve hot.

Boiled egg

Name of dish	Plain omelet	**Preparation time:**	5 mins
Number of portions:	1	**Size of unit:**	1
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 8 mins**
Egg	1		
milk	10 gm.		
Salt	As required		
Oil	3 ml.		
Black pepper	As required		

Method:

1. Beat egg in a bowl
2. Add milk, salt and pepper in it
3. Heat oil slightly in frying pan
4. Pour the mixture in it
5. Cook slowly and lift the omelet
6. Serve hot with a slice of toast bread

Plain omelet

Name of dish	Scrambled egg	**Preparation time:**	5 mins
Number of portions:	1	**Size of unit:**	1
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 8 mins**
Egg	1		
Milk	10 gm.		
Salt	As required		
Butter	3 gm.		
Black pepper	As required		

Method:

1. Beat egg and add seasoning in it
2. Add milk into it
3. Pour butter in frying pan
4. Heat it until melt
5. Pour the egg into heated pan
6. As the mixture cook, stir it continuously with spatula
7. Remove from heat when fully tender and serve

Scrambled egg

Name of dish	Scotch egg	**Preparation time:**	10 mins
Number of portions:	1	**Size of unit:**	1
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 15 mins**
Egg	1		
potato	2 medium		
Salt	As required		

Lemon juice	3 ml.		
Black pepper	As required		
Bread crumbs	25 gm.		
Oil	For deep frying		

Method:

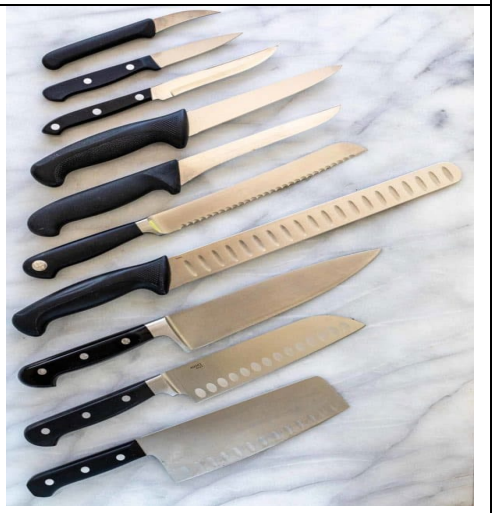
1. Wash and peel potatoes
2. Boil them in water
3. Take out of water when tender
4. Mash the potato with fork
5. Add salt, pepper and lemon juice in it
6. Hard boil the egg
7. Remove the shell of egg
8. Cover it with mashed potato
9. Apply egg coat and crumbs
10. Deep fry in hot oil and serve

Scotch egg

6.3.1 Tools and Equipment to make dairy products correctly.

Tools and equipment use for dairy products include:

	
Stove	Cooking pots
	
Pans	Ladles
	
Bowls	Measuring scale

	
Refrigerator	Graters
	
Chopping boards	Knifes
	
Measuring spoons and cups	Electric mixers

	
Oven	Working stations

6.3.2 Methods to prepare dairy products

Dairy products can be prepared from different methods with different products.

1. Cream:

Method A:

You need raw milk and a heat resource. Leaving the milk to stand for about 24 hours at the temperature of 4C to 12C, cream can be skimmed off using a spoon. Cream rises and then stays on top of milk. It contains most of milk fat in the foam of cream. Only cow milk produces cream by this method, other kind of milk need a hand creamer to separate milk and cream.

Method B:

Heat the milk slightly at 40C and pour it into upper bowl of separator. It is important to turn the handle at a constant speed during separation. After separating the milk from cream, pasteurized them. The use of separate produces more cream and less milk with less fat.

A disadvantage is that separator has to be clean properly, including the disks, this takes much time and efforts.

2. Butter:

Ingredients and utensils:

- Pasteurized cream
- Sour milk
- Stove
- Pan
- Thermometer
- Cold water
- Churning container
- Sieve
- Bowl
- Wooden spoon

Method:

Butter is made by churning of cream and sour milk. The milk can be soured and churned as a whole. Heat the milk or cream to temperature of 85C, cool down to 18C as quickly as possible. Add 2 tbsp of fresh fermented sour milk and stir. After about 24 hours, mixture will become thick and sour enough to be churned.

During churning the cream and sour milk will be mixed intensively with air. This process produces butter and butter milk.

3. Ghee:

Heat the butter until water and fat separates, fat will float on top. There are 2 ways to remove water from butter. It can be removed by heating as water present will evaporate. Another method is to remove layer of fat with spoon. The fat should be heated again. The color of ghee can vary from white to dark brown.

4. Yogurt:

Heat the milk at more than 85C and keep at this temperature for 3 minutes. Cool the milk to 45C. Add 2 tbsp of fresh yogurt to each liter of milk. The time required for milk to turn sour depends on temperature.

5. Cheese:

Cheese is produced with acid and rennet. It can store for some weeks to some months.

Procedure for making cheese

6.3.3 Different dishes from dairy products

As you know that we can make different culinary and baking dishes by using dairy products like gulab jaman, custard, firni, kheer, muffins, cakes, pizzas, pastries and many more products.

Some examples of these dishes are listed below:

I. Kheer

Name of dish	Kheer	**Preparation time:**	10 mins
Number of portions:	1	**Size of unit:**	1
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 15 mins**
Basmati rice	30 gm.	Soak in water for 1	

(crushed)		hour	
Milk	1 liter		
Sugar	125 gm.		
Cardamom powder	¼ tsp		
Almond	10 gm.	Chopped and blanched	

Method:

- In a pot add milk and bring it to boil, add rice and cooked for 10 minutes.
- Keep stirring, add sugar and cardamom powder mix well and cook on low flame for 10 mins.
- Add almonds. Rice kheer is ready to serve.

Traditional kheer

Muffins:

Name of dish	Muffins	**Preparation time:**	15 mins
Number of portions:	4	**Size of unit:**	80 gm.
Commodities:			
Items	**Quantity**	**Specifications**	**Baking time: 30 mins**
Sugar	250 gm.		
Flour	300 gm.		

Egg	1		
Yogurt	125 gm.		
Oil	125 ml.		
Baking soda	5 gm.		
Vanilla essence	3-4 drops		

Method:

- Mix and sift baking soda and flour
- Beat milk, and then add yogurt, oil, egg and vanilla essence.
- Add sugar and mix well.
- Lastly fold flour mixture in it.
- Bake at 180C for 25 mins.

Chocolate chip muffins

Nan Khtai:

Name of dish	Nan khtai	**Preparation time:**	15 mins
Number of portions:	4	**Size of unit:**	60gm.
Commodities:			
Items	**Quantity**	**Specifications**	**Baking time: 30 mins**

Ghee	200 gm.		
Sugar	200 gm.		
Flour	200 gm.		
Egg yolk	1		
Cardamom powder	3 gm.		
Almond	100 gm.		

Method:

- Melt ghee and freeze for 10 mins
- Then add sugar and beat well
- Combine and sift flour, cardamom powder, fold well in mixture
- Add roasted and chopped almonds into mixture
- Make small balls
- Bake at 160C for 20-25 minutes.

Nan khtai

Gajar ka halwa:

Name of dish	Gajar ha halwa	**Preparation time:**	30 mins
Number of portions:	8	**Size of unit:**	150 gm.
Commodities:			

Items	Quantity	Specifications	Cooking time: 30 mins
Carrots	1 kg		
Sugar	375 gm.		
Milk	1 liter		
Khoya	200 gm.		
Pistachios	50 gm.		
Ghee	200 gm.		
Boiled eggs	4		
Almonds	For garnishing		

Method:

- Boil milk and add carrots in it
- Boil them until carrots fully done and milk dries
- Add sugar and cook for 10 mins
- Lastly add khoya and pistachios and cook for 15 mins.
- Garnish it with almonds and boiled eggs.
- Halwa is ready to serve

Gajar ka halwa- Traditional Sweet

Name of dish	Halwa	**Preparation time:**	10 mins
Number of portions:	4	**Size of unit:**	100 gm
Commodities:			

Items	Quantity	Specifications	Cooking time: 15 mins
Suji	125 gm.		
Sugar	125 gm.		
Ghee	125 ml.		
cardamom	3 gm.		
Almonds	10 gm.		
Water	100 ml.		
Milk	20 ml.		

Method:

1. Pour ghee in a pan and heat it
2. Pour cardamom in it
3. Add suji and fry until golden brown
4. Remove from fire and add water and milk in it
5. Heat the pan, cook till tender
6. Dry the water
7. Add sugar in it
8. Garnish almonds and pistachios and serve

Suji ka halwa

6.4 Special consideration for eggs and dairy

Egg is a key component in baking, as almost every product of baking is made with eggs. Consideration of eggs in kitchen includes

- Eggs are used for making different types of puddings
- Enhances the nutritional value of other foods
- Rising agent
- Emulsifying agent
- Binding substance and coating
- Thickening agent
- Glazing and sealing
- Clarifying fluids
- Controlling crystallization

Dairy products are used in different food industries in all over the world. We can use dairy products in the production of different food items and other products (like cosmetics, medicines). Dairy products are used in cooking and baking. Dairy products such as milk, butter, cream, eggs are the major ingredients of the banking industry of worldwide.

Activity: Arrange class into small groups. Assign them a task to make fried eggs and onion omelet.

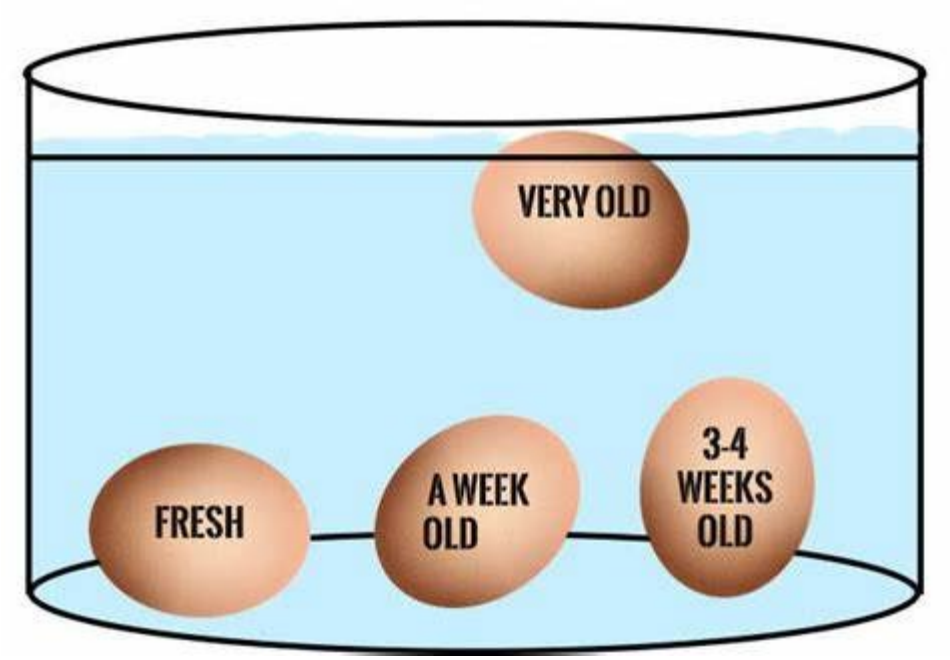
6.4.1 Identify contaminated eggs and dairy

Dairy products are identified through their odour, color, texture, taste, use by and best before day which are mentioned on the package of the product. The lower and middle shelf of your refrigerator should be reserved for dairy food items like milk, cheese and yogurt. Dairy products should be covered and other food items which

Do you know?

Pakistan is the fifth largest milk producer in the world. Milk production is 28 million tons from 125 million heads

have strong odor should be kept away from dairy products because milk and other dairy products can catch the odour of other food items.



How to check fresh and old eggs

6.4.2 Contaminants present in eggs and dairy dishes

Egg shells may become contaminated with Salmonella.

Salmonella contaminates the eggs from live poultry droppings from the area where the eggs are laid.

Precautions:

- Keep eggs refrigerated at 4°c.
- Cook eggs until both yolk and white are firm.
- Egg dishes should be cooked on approx. 73°

Do you know?

The centers for disease control estimate that 1 in every 20,000 eggs are contaminated with Salmonella.

Contaminants in Dairy

The common chemical contaminants in milk and dairy products are Antibiotics, anthelmintic drugs, hormones, pesticides, heavy metals, my cotoxins, nitrites etc.

The principal components of milk are water, fat, protein, lactose (milk sugar), and different types of salts and minerals.

Milk contains some amount of many other substances such as enzymes, vitamins, pigments, and gases etc.

6.4.3 Handling and storage of eggs and dairy based foods

Storage of eggs

Eggs should store in the coldest part of the refrigerator at 4C.

Eggs in the shell should be consumed within three to five weeks when stored in the refrigerator and hard-boiled eggs can be stored for a week but always check the use by date displayed on the carton.

Handling of eggs is very delicate procedure because it can be break easily. Eggs packing for storage and handling should be unbreakable plastic packing. Packing should be hygienic.

Raw leftover eggs should be wrap properly and stored in chiller.

Storage of dairy products

Milk and milk products such as yogurt and cheese should be stored at 4°C or below. Put them into the refrigerator as soon as possible.

For ice-cream if you want to keep its quality, texture and flavor good put it into the dairy chiller and make sure that the temperature you are storing it in -18C or below.

Keep milk containers closed, and stored them away from the other food items because it can cause contamination as well as the milk can pick up the odors of the other food items.

Milk should be stored on the refrigerator shelves but in the doors of the refrigerator.

Dairy products	Products	Temperature
Milk	Firni Kheer	2˚C to 4˚C

	Gajar halwa Custard Puddings	
Yogurt	Creamy Greek yogurt Cream cheese	4˚C
Ice-cream	Frozen ice-cream	-18˚C
Cream	Skim milk	0˚C to 4˚C
Cheese	Why Mozzarella Cheddar	0˚C to -2˚C

6.4.4 Risks involved in ovo-lacto-allergens

Ovo- lacto allergens are the allergies made from milk and egg products and their byproducts. Milk allergies are usually developed in infants. Egg allergies are often associated with skin allergies.

For example, if Ali eats biscuits in which eggs are present, than his skin produces rashes as well as itching.

Tidbit!

In the term Ovo-lacto the word "ovo" refers to eggs while "lacto" refers to dairy products.

Do you know?

Ovo-lacto vegetarian is a plant-based vegetarian diet in which meat, fish and poultry are not included but products like dairy and eggs are included in this diet.

- Dairy products are the type of foods which produce from the milk of mammals such as buffalo, goat, sheep and camels. Dairy products are also known as milk products. It includes food items such as yogurt, cheese, butter etc.

- Fermentation process is a chemical process that produces different chemical changes in organic substances and breaks down into simpler substances through the action on enzymes.

- Milk is a nutrient/rich liquid food processed by mammals. Protein and lactose are 2 major nutrients which are present in milk.

- Eggs act as binding agents in making of different dishes. Protein part of eggs helps in binding of ingredients together and giving strength and stability to different dishes. Eggs are also used in coating of snacks with flour and crumbs.

- The processing of food is the basic preparation of food, packing, storing and preservation. A number of innovations are the result of food processing such as fruit juices, frozen and instant foods.

- Ovo- lacto allergens are the allergies made from milk and egg products and their byproducts. Milk allergies are usually developed in infants. Eggs allergies are often associated with skin allergies.

Exercise

Mark the correct option

Mark the correct answer

1. The boiling temperature of Milk is
   a. 100C
   b. 105 C
   c. 110C
   d. None of these
2. Shelf Life of Yogurt is
   a. 4-6 hours
   b. 4-6 days
   c. 4-6 weeks
   d. none of these
3. What is the serving temperature of kheer?
   a. 5˚C
   b. 15 ˚C
   c. 35 ˚C
   d. 45 ˚C
4. What is ovo lacto allergen?
   a. Milk and egg allergy
   b. Milk and cream allergy
   c. Egg and flour allergy
   d. Gluten allergy

Give short answers

1. Enlist categories of dairy products?
2. Enlist production steps for the production of cheese?
3. Enlist special attributes of egg in baking?
4. How to handle and stored cheese products?
5. Write down the tools and equipment used in production of firni?

Answer the following question in detail.

1. Describe the methods to prepare any two dairy products?
2. Write down the uses of eggs in different cooking and baking dishes?

Activities

1. Arrange the class in small groups, give them a task to prepare, cook and finish any 3 egg products.
2. Prepare, cook and finish any 3 sweets by using dairy products and present with recipe card.

Note for teachers

1. Explain and demonstrate the students about the production of different milk based recipes.

2. Make sure that everyone is wearing PPE in kitchen lab, help them to learn about the use of egg in different cooking and baking dishes.

Chapter 7: Butchery

Students learning outcomes

After completing this chapter, you will be able to

- know about categories of meat and quality points
- learn about the inspection and grading of mutton & beef
- understand meat storage conditions
- know about the main cuts of meat
- learn about poultry types like broiler, fryer, roasting and ducklings etc
- differentiate between light meat and dark meat
- know the basic procedures for cutting chicken
- understand the contamination risk associated with poultry
- learn about different types of seafood
- know about the categories of seafood
- learn about safe storage and handling seafood
- know about the cutting of fish

7.1 Beef and Mutton

Do you know about the fine cuts of meat?

Beef is important part to the food service industry, worldwide. Beef is significant source of protein. This expensive product demand special care and training cattle used for the beef industry.

Fine cuts of beef

Mutton is the tender meat produced by young, healthy and domesticated goats. Its texture is a direct result of what it consumes and the age at which it is slaughtered.

7.1.1 Categories of meat and quality points

There are 5 basic categories of meat.

I. Red Meat- This includes beef, mutton and lamp
II. White meat- this includes all type of poultry such as chicken, turkey.
III. Seafood – This includes fish, crabs, lobsters, mollusks, oysters and all seafood.
IV. Game meat- This includes flesh of non-domesticated animals like deer and rabbits.

Different Categories of meat

Quality points:

Quality of meat is affected by the genetic nature of the animal, how the animal is bred and the nutritional status during the production. The following factors are very important to understand the quality points of meat.

I. **Visual Identification** of quality meat based on color, marbling and water holding capacity.
II. **Smell** is a factor by which we can identify that meat is fresh or not.
III. **Firmness** meat should appear firm rather than soft
IV. **Juiciness**
V. **Tenderness**
VI. **Flavor**

Important Note!

Prime is the highest quality of beef available. Choice is still high-quality beef that has lass marbling than prime.

7.1.2 Inspection and grading of meat

Government inspection of all meat types is mandatory. Inspection is required several times. This is done to ensure that animals are free from disease and that the meat is healthy and highly suitable for human consumption.

The inspection and grading of meat and poultry are to separate programs. Any animal is inspected by a specific team. They people check however animal is ready to slaughtered and animal is healthy or not. Than after slaughtering, meat is checked and different grades are decided for meat according to be quality and visibility of meat.

7.1.3 Meat storage conditions

Meat, poultry and game should be wrapped and store in freezer. While possible, they should be held in a separate unit, or at least in a separate part of the chiller. They should always be placed on different trays to prevent them from dipping onto the other food items in which are placed in chillers.

Different kind of meats should store differently. For example, poultry should not come into the contact with beef and other products into contact with each other. They will prevent cross contamination.

All meat items which have short shelf lives should be cooked as soon as possible after they are received. Meat should be stored at proper temperature and under suitable conditions can be held for several days without loss the quality. The frozen temperature of meat is listed below

Refrigerated 28F to 32F/ -2 C to 0C

Frozen 0F to 20F/ -18C to -24C

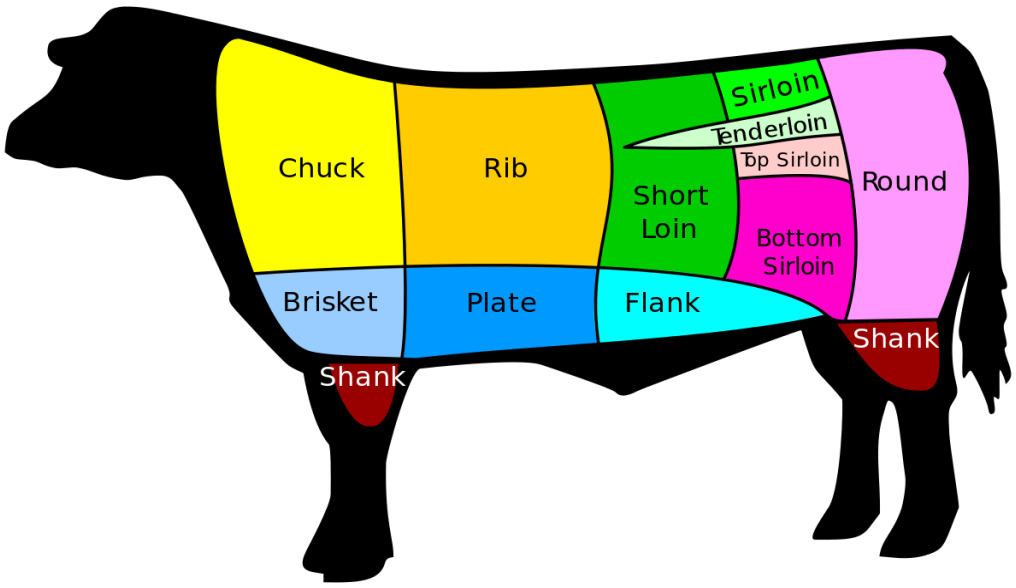
Do you know!

Raw meat should be stored at bottom shelf of refrigerator at the time of thawing to prevent cross contamination.

7.1.4 Main cuts of meat

There are basic 8 primary cuts of beef:

1. Chuck
2. Rib
3. Loin
4. Round flank
5. Short plate
6. Brisket
7. Shank



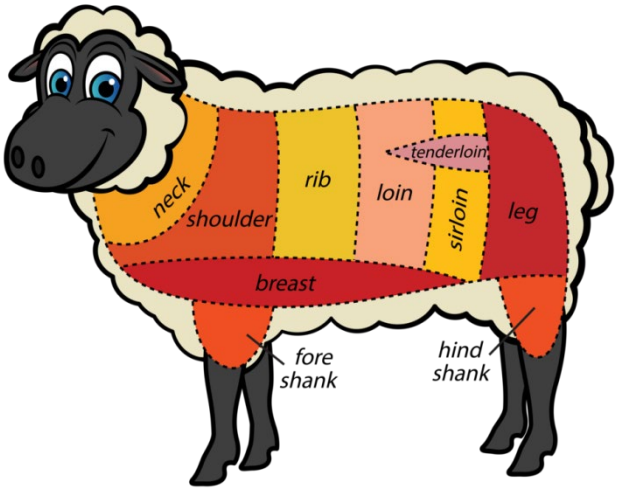
Primary cuts of beef

Main cuts of mutton:

The main cuts of mutton include:

	
Diced mutton leg	Diced mutton shoulder
	
Ground mutton	Mutton breast
	
Mutton chops	Mutton leg

	
Mutton loin	Mutton scrag

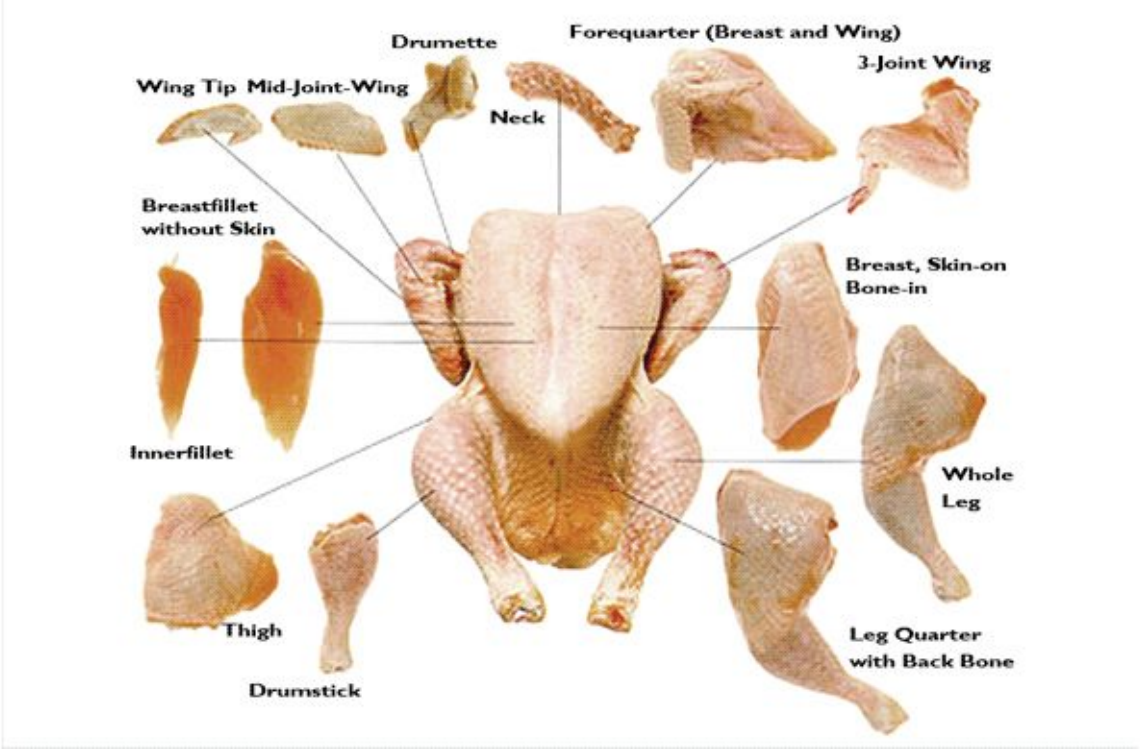


Different Cuts of mutton

Main cuts of poultry:

There are basic four main cuts of poultry:

1. Breast fillet tenderloin
2. Drumette
3. Whole wing
4. Leg

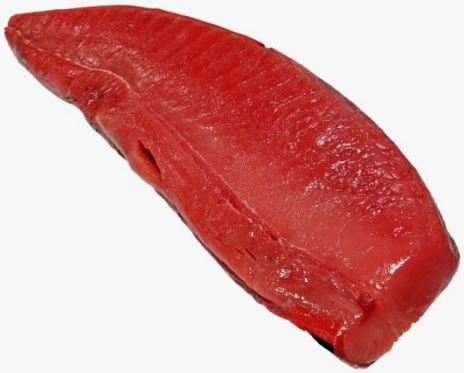


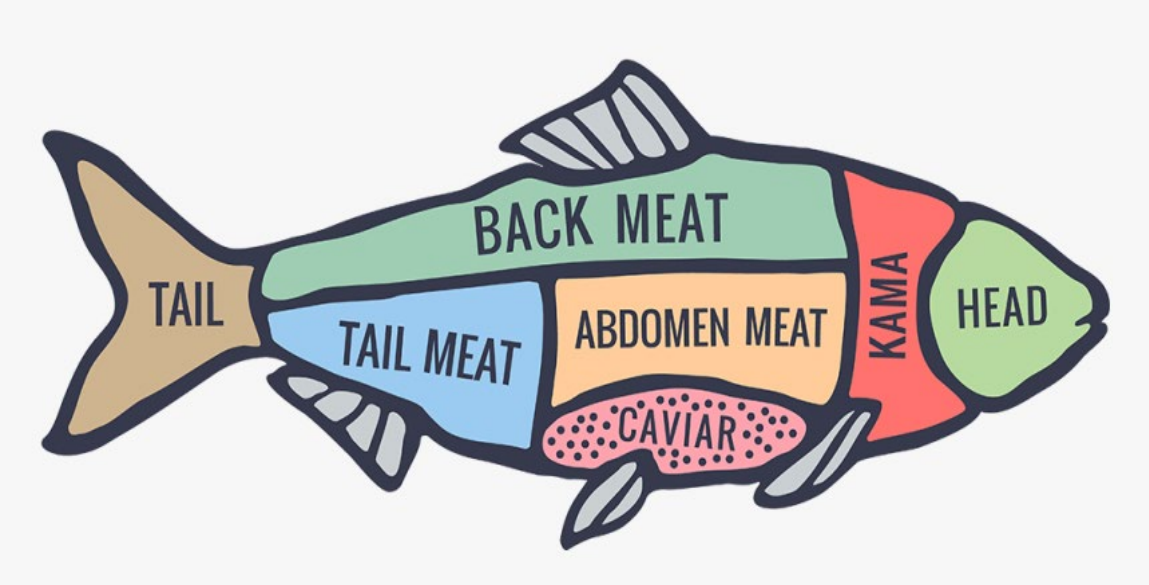
Different cuts of poultry

Main cuts of seafood:

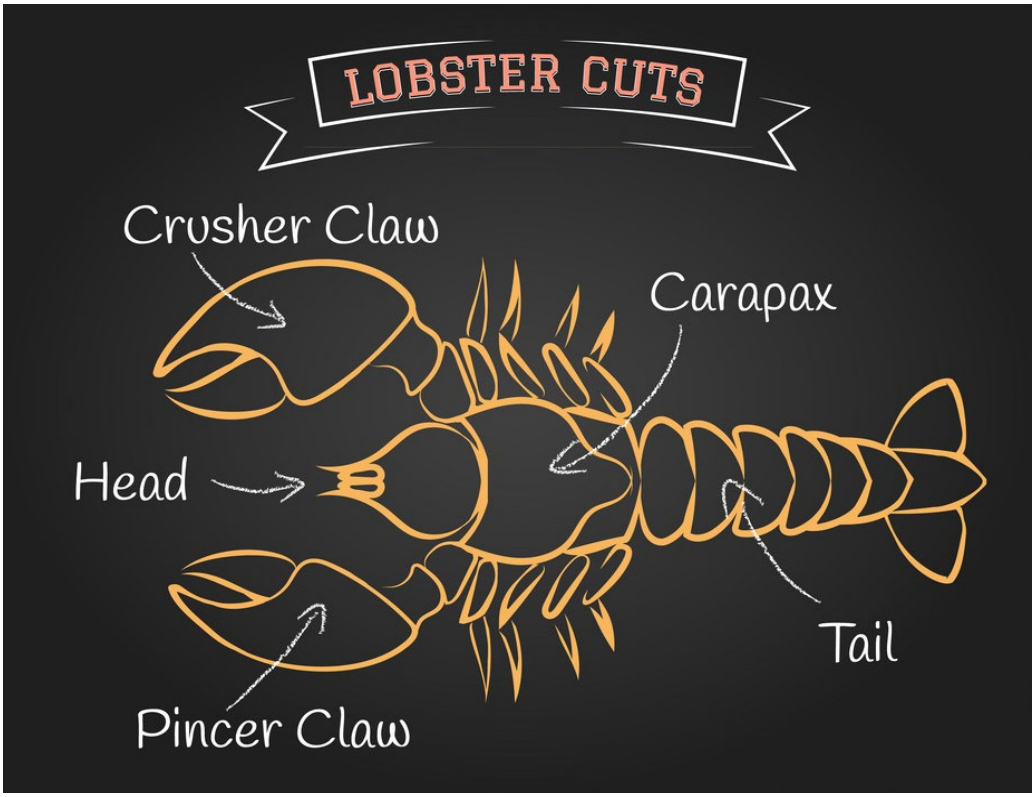
There are basic 6 main cuts of fish:

1. Fillet (meat cut from the side of fish)
2. Butterfly fillet
3. Loin
4. Steaks
5. Tail
6. Whole fish

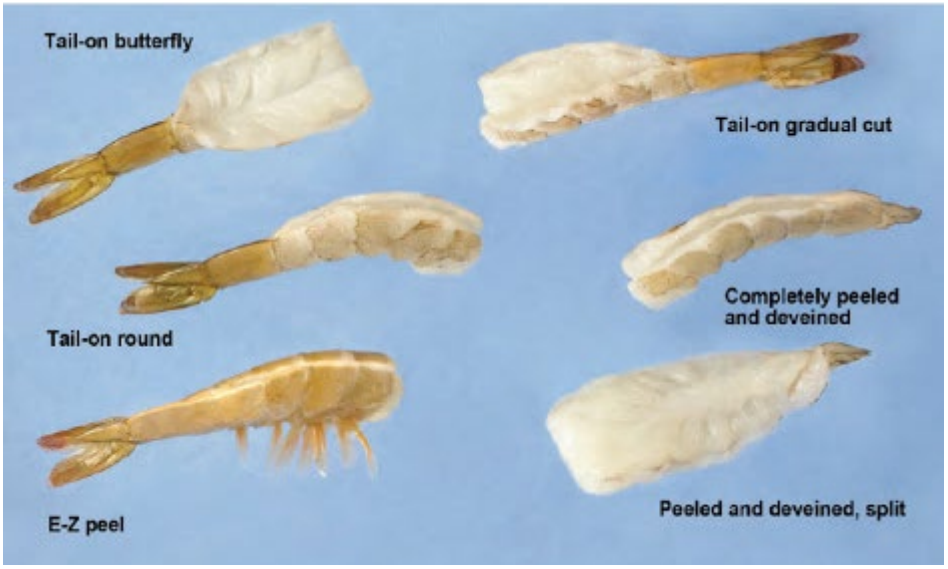
	
Fillet	Butterfly fillet
	
Loin	Steaks
	
Tail	Whole fish



Main cuts of fish



Main cuts of lobster



Main cuts of prawns

Activity: Divide the class into 5 groups then go to butcher's shop and examine different cuts of a goat and tell that which body part is used in which Pakistani cuisine.

7.2 Poultry

Poultry are domestic birds which are kept by humans for different purposes. For example, their eggs, meat and feathers are used for food and other purposes.

Poultry are great source of protein. They also provide lots of nutritional factors like iodine, iron, zinc, vitamins (especially B12) and essential fatty acids. The poultry meat is a basic part of human diet as part of their balance diet.

7.2.1Types of Poultry (broilers, fryers, roaster, duckling etc.)

A **broiler** is any chicken that is bred and raised for fulfill different needs regarding to our nutrition. We can use their eggs and meat on daily basis at commercial level.

Broilers have milk white feathers and yellowish skin. Its slaughter weight between four and seven weeks of age, although slower growing bred reach 7 weeks of age.

Fryer chickens are young and smaller in size (3-4 lb.) as compare to broiler. They are perfect for frying. You can purchase fryer chicken whole or already cut up into 8 pieces.

There is such a small price difference that it's often more convenient to purchase a cut up fryer then a whole fryer.

Roaster chicken is a type of chicken which are slaughtered at the age of 14 weeks which means they are usually larger in size then broiler and fryer chicken. Roaster is larger in size that's why it is usually roasted as whole. They may also cut up or fried.

Interesting Information!

Fryer chicken mostly used in fast and BBq food items.

A **Duckling** is a baby duck. They usually learn to swim from their mother. It is found in fresh and salt water. Duck or ducklings are eaten in so many cuisines all over the world. It is high-fat, high-protein meat which is rich in iron.

Classes of poultry	Approx. age	Approx. weight (pounds)	Common cooking methods	Common culinary uses
Broiler	4-6 weeks	1-3	Broiling, grilling, sautéing.	Prepared whole or split
Fryer	6-10 weeks	3.5-4.5	Roasting, Broiling, grilling, sautéing.	Prepared whole, split, quartered or disjointed.
Roaster	3-5 months	7-9	Roasting	Prepared whole
Broiler ducklings	Under 8 weeks	4-6	Roasting, sautéing, grilling.	Only breast is prepared.

Activity!

Prepare poultry cuts according to specifications.

7.2.2 Differentiate between light meat and dark meat

Light meat	Dark meat
Lighter – colored	Darker –colored
Milder in flavor	Enhanced taste and flavor
Made up of fast-twitch muscles fibres	Muscles with fibres that are slow-twitch
Pale in color before and after cooking	Dark in color before and after cooking
Light meat has more nutritional value	Dark meat has less nutritional value

because it has less fat and calories	because it has twice fat and calories.
Light meat contains less fat	Dark meat contains twice as much healthy unsaturated fat as light meat.
It comes from the breast of chicken	It comes to all parts of chicken

7.2.3 Procedure for cutting chicken

The step by step cutting chicken is as follow:

I. Turn your chicken breast side up your chickens' breast meat and legs are on the same side of your chicken.
II. Cut away the thighs and legs at the joint
III. Remove the wings
IV. Remove the back from the breast meat
V. Separate the breast meat

Activity: Divide students in 5 groups, take the whole chicken and cut it into according to proper procedure (step by step)

7.2.4 Contamination risks associated with poultry

Poultry meat and the products which are made up of meat and any other poultry product (eggs) can be contaminated with anti-parasitic and anti-microbial drugs or pesticides used on the farms during coarse of breeding.

The injection of anti- microbial can cause anti-microbial/resistant bacteria to develop in humans.

Due to contamination associated with poultry diseases outbreak, high cost of medication and vaccines, lack of quality feed can

Important note!

Campylobacter and salmonella infections are major food safety hazards in poultry.

take place.

Risk management practices among the followers are enterprise diversification, marketing and production statistics.

Some very serious diseases which are transmitted from poultry to humans are salmonellosis, camphlobacteriosis, chlamytiocis, tuberculosis, Newcastle. Poultry workers are at the greater risk of being affected by these diseases.

7.3 Fish and seafood

7.3.1 Types of seafood

Types of Fish:

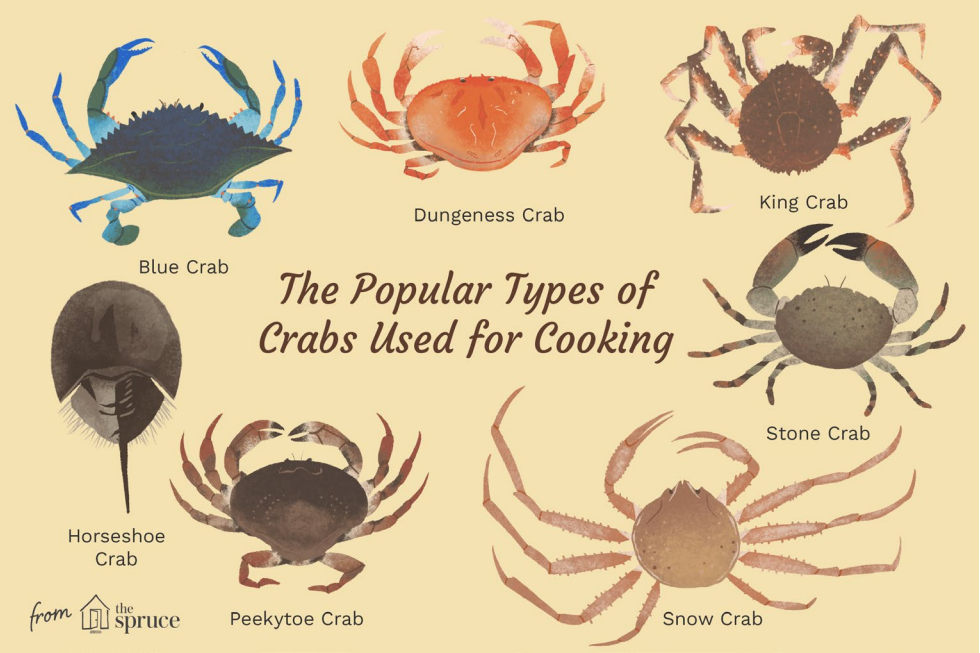
The fishes are classified according to their structures and sizes. The main eatable fishes are:

1. Alaskan salmon
2. Cod
3. Herring
4. Mahi mahi
5. Macherel
6. Perch
7. Trout
8. Sardines

Types of Crabs:

The following crabs are listed below:

1. Blue crab
2. Dungeness crab
3. Horseshoe crab
4. King crab
5. Peekyteo crab
6. Rock crab



Types of prawns:

The types of shrimps used in cooking are:

1. Pink shrimps
2. Brown shrimps
3. White shrimps
4. Rock shrimp
5. Tiger shrimp
6. Spot shrimp
7. Red cherry shrimp

7.3.2 Categories of seafood

There are 3 major categories of seafood:

I. Fish
II. Shellfish
III. Invertebrates

Activity 1: Make a chart and describe different categories of seafood

Hint: there are three major types of seafood are their fish, shellfish and invertebrates.

Activity 2: Differentiate between salt water fishes and fresh water fishes?

7.3.3 Storage and handling of seafood

What do you know about handling of seafood?

All foods including seafood must be handled and prepared in a clean and suitable environment to avoid cross contamination. Always keep your hands clean while preparing or handling the food and utensils.

Do you know?

Over 33000 species of fish and many more marine invertebrates' species have been discovered.

Important Tip!

Never let raw seafood come in contact with cooked or ready to eat food e.g., salads, fruits or smoke fish.

There are some tips for better seafood handling

- Handle with care to reduce physical damage
- Keep it separate to avoid cross contamination
- Keep raw and cook's seafood separate to avoid cross contamination
- Keep it clean
- Keep it cool with correct temperature
- Keep it covered
- Keep it moist
- Keep it moving

Do you know?

Seafood is more perishable than other food items.

Storage temperature for fish is described below.

- Chilled seafood must be stored in a clean tidy environment between 0C and 2C (if not live)
- Frozen seafood is stored at 0C to -2C

Storage of fresh seafood

7.3.4 Cutting of Fish

The6 most common cuts of fish are listed below

I. Fillet- a fillet is a meat cut from the side of the fish
II. Butterfly fillet
III. Loin
IV. Steaks
V. Tail
VI. Whole fish

Activity: Each student should practice each cut of poultry in kitchen.

Key Points

- Beef is essential to the food service industry, worldwide. Beef is significant source of protein. This expensive product demand special care and training cattle used for the beef industry.

- Mutton is the tender meat produced by young, healthy and domesticated goats. It's classified into 5 basic categories.

- The perfect storage temperature of fresh meat is 0C to -2C, and for frozen meat is -18C to -24C.

- Poultry are great source of protein. They also provide lots of nutritional factors like iodine, iron, zinc, vitamins (especially B12) and essential fatty acids. The poultry meat is a basic part of human diet as part of their balance diet.

- A **broiler** is any chicken that is bred and raised for fulfill different needs regarding to our nutrition. We can use their eggs and meat on daily basis at commercial level.

- **Roaster** chicken is a type of chicken which are slaughtered at the age of 14 weeks which means they are usually larger in size then broiler and fryer chicken.

Exercise

Mark the correct option

1. The best cuts of beef for steak
   a. Sirloin
   b. Scotch fillet
   c. Eye fillet
   d. Flank
2. The disease which can take place through uncooked meat is
   a. Flu and cough
   b. Eye pain and headache
   c. Skin infection
   d. Vomiting and abdominal cramping
3. Which knife is best for cutting meat?
   a. Chef's knife and Shantou chefs knifes
   b. Paring knife
   c. Boning knife
   d. Bread knife
4. Which cutting board is used for handling the raw meat
   a. White cutting board
   b. Yellow cutting board
   c. Red cutting board
   d. Blue cutting board

Give short answers

1. Enlist the quality points of meat?
2. What is storage temperature for mutton in freezer?
3. What is dark meat?
4. Which is the common cut of fish offered in restaurants?

Answer the following question in detail.

1. Describe different types and cuts of seafood?
2. What are the basic procedures for the cutting of beef?

Activities

1. Arrange the students into 4 groups, each group make a chart on lamb, mutton, beef and poultry cuts.
2. Plan industrial visit in any butchery shop, observe and learn about different cuts of meat, poultry and seafood.

Note for teachers

Demonstrate different cuts of meats. How to use, clean and sanitize cutting boards and knifes. Teach them about various knifes for different cutting styles of meat. The students have to make assignment on these cutting styles which they practiced in kitchens.

Chapter 8: Beverages

Students learning outcomes

After completing this chapter, you will be able to

- learn about types and categories of beverages
- understand the roll of beverages in food industry
- know standard process to prepare hot & cold beverages
- use appropriate methods & temperatures to prepare hot & cold beverages
- prepare hot and cold beverages as per standard recipe
- describe the quality points of hot & cold beverages

8.1 Beverages

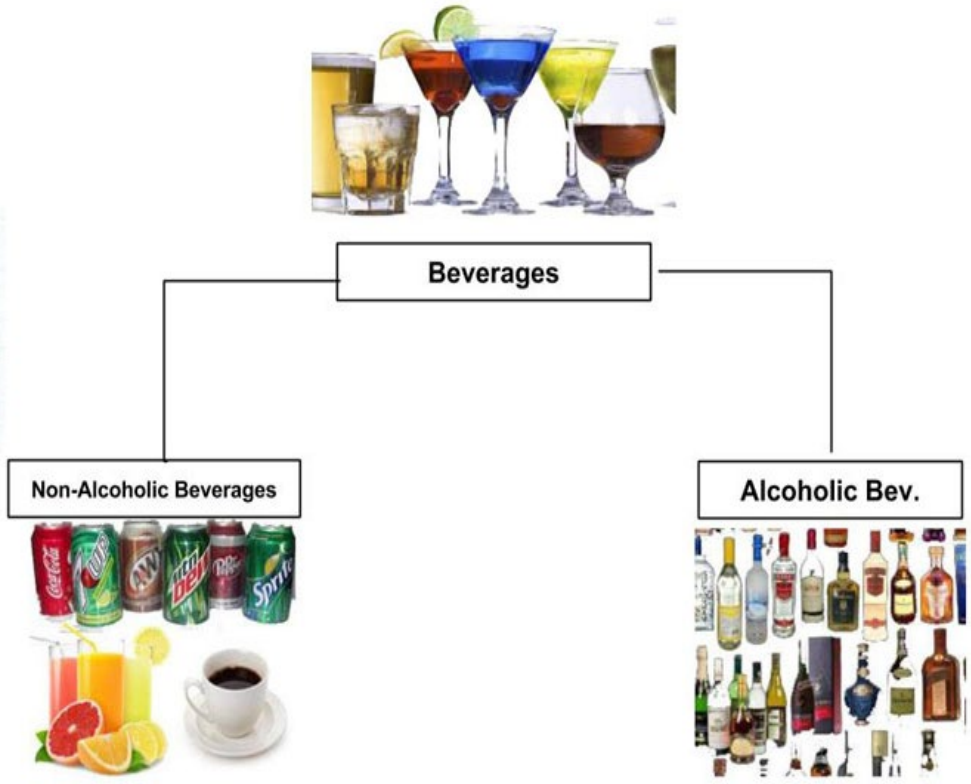
Do you know about the term beverages?

Beverage means any liquid to consume (portable liquid), including water.

For commercial purpose a beverage is a portable liquid consisting of water and some other ingredients.

This may include any drink which we can take with our meals throughout the day.

8.1.1 Types and categories of beverages



Types and categories of Beverages

A beverage is form of liquid used for energy and hydration. Types of beverages have been increasing over time with more variety of flavors and tastes. There are basically two types of beverages

1. Alcoholic Beverages
2. Non-alcoholic Beverages

Alcoholic beverages are liquid with 1 % and 75% of ethyl alcohol or ethanol. These beverages are fermented with sugars in fruits, berries and other ingredients like honey and milk.

Non-alcoholic beverages are drinks without alcohol, or with alcohol lessened too almost none. Examples of non-alcoholic products are

- Water
- Milk
- Tea
- Coffee
- Sparkling tea
- Juices
- Energy drinks
- Mock tails
- Milk shakes
- Smoothies

Hot and cold Beverages:

Some example of cold beverages is as follows:

	
Fruit juices	Vegetable juices

Fruit nectars – mixture of juice and water

Punch- flavored water and sugar

Ice tea- tea that is cold

Lemonade – drink made of lemon, salt and sugar

Ice coffee- coffee with crushed ice and ice-cream

Some examples of hot beverages are

	
Fruit tea	Fresh mint tea
	
Hot chocolate	Coffee
	
Hot lemon	Black tea

	
Green tea	Tea

8.1.2 Role of beverages in food industry

Beverages are very important part of the food industry. As we know that beverages include both alcoholic and non-alcoholic (water, soft drinks, juices, tea coffee, smoothies, dairy beverages, carbonated none carbonated) drinks etc.

The quality of the food in hospitality industry is very important for the good sales and business point of view. The menu of all restaurants contains a specific portion for beverages in which all types of beverages are included according to the nature of hotel or restaurants.

All food items which are served as appetizers, main course, side course, snacks and desserts, beverages play a specific role now a days. For example, soft drinks and juices are served with main course and tea or coffees are served as appetizers. In hitea and buffet setups are special trends these days where different types of beverages are served according to need and requirement of customers.

Beverages served with Food

8.2 Preparation of Beverages

The preparation of beverages consists of 3 phases

1. Liquid preparation and treatment
2. Simple syrup preparation
3. Final syrup preparation

Basic techniques which are important for preparation of any beverage

I. Shaking
II. Straining
III. Stirring
IV. Blending
V. Layering
VI. Flaming

8.2.1 Standard process to prepare hot & cold beverages

Cold beverages:

Mint margarita (non-alcoholic cold beverage)

Name of dish	Mint margarita	**Preparation time:**	15 mins
Number of portions:	4	**Size of unit:**	80 ml.
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 0 min**
Mint (washed well)	200 gm		
Sugar	According to taste		
Lemon juice	15 ml.		
Black salt	5 gm.		
Soda	250ml.		
Ice cubes	6-8		

Method

Mix all the ingredients and blend it.

Mint margarita

Punch

Name of dish	Punch	**Preparation time:**	20 mins
Number of portions:	1	**Size of unit:**	250 ml.
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 10 min**
Sugar	15 gm.		
Soda	500 ml.		
Mango squash	80 gm.		
Lemon juice	15 gm.		
Crushed colored iced	As required		

Method

- Make syrup of sugar with water.
- Add mango squash and lemon juice in it
- Add soda water in it
- Pour punch into glass
- Add colored ice in it.

Punch

Mango squash (Non-alcoholic cold beverage)

Name of dish	Mango squash	**Preparation time:**	15 mins
Number of portions:	12	**Size of unit:**	80 gm.
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 0 min**
Mango (peeled and cube)	2 kg		
Sugar	1 kg		
Water	1 liter		
Lemon juice	25 gm.		

Method

1. Blend all the mangoes and set aside.
2. Pour sugar in a pan, add water into it
3. Mix until sugar dissolves
4. Cook until syrup thickens
5. Add mango puree into it
6. Mix well and cook for 3-5 minutes on medium or low flame.
7. Add lemon juice into it
8. Let it cool and pour it into an air tight bottle.

Mango squash

Cold coffee (Non-alcoholic cold beverage)

Name of dish	Cold coffee	**Preparation time:**	15 mins
Number of portions:	4	**Size of unit:**	80 gm.
Commodities:			
Items	**Quantity**	**Specifications**	**Baking time: 30 mins**
Instant coffee	25 gm.		
Water	20 ml.		
Sugar	25 gm.		
Milk	500 gm.		
Cream	25 ml.		
Ice cream	2 scoops		

Method

1. Mix instant coffee in water.
2. Combine all ingredients in blender and blend well.
3. Decorate glass with chocolate sauce.
4. Pour in glass and serve nicely.

Cold coffee

Strawberry fizz (Nonalcoholic cold beverage)

Name of dish	Strawberry fizz	**Preparation time:**	15 mins
Number of portions:	4	**Size of unit:**	150 ml.
Commodities:			
Items	**Quantity**	**Specifications**	**Baking time: 0 mins**
Strawberry	10 gm.		
Sugar	30 gm.		
Lemon juice	15 gm.		
Ice cubes	7-8 pieces		
Soda water	500 ml.		

Method

Mix all ingredients and blend them.

Strawberry fizz

Hot chocolate (Non-alcoholic hot beverage)

Name of dish	Hot chocolate	**Preparation time:**	20 mins
Number of portions:	12	**Size of unit:**	250 ml.
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 10 min**
Granulated sugar	65 gm.		
Coco powder	65 gm.		
Milk	1 liter		
Semisweet chocolate	125 gm.		
Vanilla essence	5 gm.		

Method

- Heat the milk at medium flame.
- Add granulated sugar into it.
- When it becomes boil, then add coco powder and semi-sweet chocolate in it.
- Pours in cups, serve as hot.

Hot chocolate

Hot coffee (Non-alcoholic hot beverage)

Name of dish	Hot coffee	**Preparation time:**	20 mins
Number of portions:	2	**Size of unit:**	250 ml.
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 10 min**
Instant coffee	25 gm.		
Sugar	25 gm.		
Hot water	35 ml.		
Milk	250 gm.		

Method

- Heat the milk at medium flame.
- Dissolve coffee into water, add sugar and blend well.
- When it becomes boiling, then pours milk in cups and adds coffee mixture on top.

Hot coffee

Kashmiri tea (hot dessert)

Name of dish	Kashmiri tea	**Preparation time:**	20 mins
Number of portions:	2	**Size of unit:**	250 ml.
Commodities:			
Items	**Quantity**	**Specifications**	**Cooking time: 10 min**
Tea leaves	10 gm.		
Milk	500 ml.		
Salt	2 gm.		
Cardamom	4-5		
Water	3 cups		

Method

- Pour water in bowl and add leaves, cardamom and salt.
- Allow it to boil
- Boil the water until 1 cup left
- When pink foam is visible, stain it.
- Add milk in it and cook well.
- Boil it and garnish with pistachios
- Pour in cup and serve.

Kashmiri tea

8.2.2 Appropriate methods and temperatures to prepare hot & cold beverages

Basic **methods** which are important for preparation of hot and cold beverages includes

I. Shaking- is a method in which we mix all ingredients together and chill them simultaneously.
II. Straining- is to remove various solids before next step.
III. Stirring- gently combines the ingredients.
IV. Blending- take all ingredients and blend it into blender
V. Layering- is process in which different layers of liquids are slightly added according to their density as various liqueurs are used to create different colors.
VI. Flaming- is the method in which a beverage or liquor is set alight, normally to enhance the flavor and presentation of a drink.

Temperatures for the service of hot and cold beverages

Hot & cold beverages	Temperatures(C)
Iced tea	0˚C to 2˚C
Cold coffee	1˚C to 4˚C
Mango shake	4˚C
Mint margarita	0˚C to 2˚C
Lemonade	4˚C
Strawberry fizz	4˚C
Coffee	82˚C to 85˚C
Tea	82˚C to 85˚C
Black tea	82˚C to 85˚C
Green tea	82˚C to 85˚C

8.3 Finishing and quality points

8.3.1 Prepare hot & cold beverage as per standard recipe

The preparation of Cold beverage is:

Standard recipe card

Name of dish	Pineapple juice	**Preparation time:**	10 mins
Number of portions:	2	**Size of unit:**	1
Cost per portion:	200	**Cost per unit:**	400
Commodities:			
Items	**Quantity**	**Specifications**	**Baking time/ Baking temperature**
Pine apple	1 cup	Sliced	
Sugar	2 tbsp	Table sugar	
Honey	1 tbsp		
Salt	1 pinch		
Water	1 cup		

Preparation methods:

- Slicing
- Pouring
- Blending

Finishing methods:

- Garnishing

Garnishing of cold beverage with mint & lemon

Hot beverages

Standard recipe card

Name of dish	**Cardamom tea**	**Preparation time:**	**15 mins**
Number of portions:	2	Size of unit:	1
Cost per portion:	80	Cost per unit:	160
Commodities:			
Items	**Quantity**	**Specifications**	**Baking time/ Baking temperature**
Milk	1 cup		
Tea	1 tbsp		
Honey	1 tbsp		
Cardamom	1		
Cinnamon	1 inch		
Sugar	½ tbsp		

Preparation methods:

- Mixing
- Pouring
- Boiling

Finishing methods:

- Garnishing

Presentation of hot beverage

8.3.2 Quality points for hot & cold beverages

Quality points of hot & cold desserts

- Specific glasses should be used according to the nature of the beverage. It looks very attractive and stylish.
- Specific **temperature** the beverages should be served on their true serving temperatures for example the temperature of cold beverages are 0°C to 4°C and the temperature of hot beverages are 75°C to 85°C
- **Flavor** should be enhanced
- **Garnishing** on the top of glasses should be done very nicely so the appearance of the beverages looks more attractive and beautiful.
- The **color** of the beverage should be nice and fresh
- Texture should be good so that beverage look fresh
- **Quality** of beverage should be good because good quality will increase sale and profit of products.
- **Quantity** should be enough for one person so that the person who pays for the beverage can satisfy his thirst and carving for beverage.
- **Variation** after some time period some change in the presentation should be take place because innovation attracts more than the old and previous look.

Mind Teaser!

Beverages expert are called Barista.

Key points

- Beverage means any liquid to consume (portable liquid), including water. For commercial purpose a beverage is a portable liquid consisting of water and some other ingredients.
- A beverage is foam of liquid used for energy and hydration. Types of beverages have been increasing over time with more variety of flavors and tastes. There are basically two types of beverages alcoholic and non-alcoholic.
- The preparation of beverages consists of 3 phase's water preparation, simple syrup preparation and final syrup preparation.
- The basic methods for the preparation of hot & cold desserts include shaking, straining, stirring, blending, layering etc.

Exercise

Mark the correct option

1. A flute glass is used for serve the
   a. Milk
   b. Hot chocolate
   c. Champagne
   d. None of these
2. Which one of the following is cold drink
   a. Peach fizz
   b. Almond hot milk
   c. Cinnamon coffee
   d. Hot chocolate
3. Soy beverage is a base of
   a. Vegetable based drink
   b. Plant based drink
   c. Lentil based drink
   d. Fruit based drink
4. Orange color of beverage represents the
   a. Nature and health
   b. Happiness and fresh mood
   c. Adventure
   d. Reliability and wisdom

Answers short questions

1. Enlist the types of beverages?
2. What is mint margarita?
3. Why food beverages are important in hospitality?
4. What are hot beverages?
5. What is the garnishing material for punch?

Answer the following question in detail.

1. Describe the quality points of hot & cold beverages?
2. Draw the standard recipe card for the preparation of hot coffee?
3. Describe appropriate temperatures to prepare hot & cold desserts?

Activities

1. Divide the class into 4 groups, each group make one recipe for hot desserts.
2. Divide the class into 4 groups, each group make one recipe for cold desserts.
3. Prepare and present standard recipe card individually.

Note for Teachers

1. Explain students how to make standard recipe card.
2. Teach different equipment and tools used in the production of beverages.
3. Demonstrate garnishing & presentation techniques of hot & cold beverages.

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GLOSSARY

A la carte - Menu dishes individually ordered and priced.

AL dente - It is an Italian term means "to the tooth" it is a cooking terminology for cooked pasta or other food items with a bit of bite, but not a hard center.

Allspice - it is a combination of different spices such as cloves, cinnamon, nutmug, black pepper, bay leaves etc.

Agr agr - it is an alternative to gelatin for vegetarians.

Abrasive - Any material which can be used for grinding or polishing.

Bacteria - a single celled micro-organism which cause changes in food.

Bain - Marie - a water bath like container which keep the food hot and fresh.

Baking - it is a dry heat cooking method used in bakery.

Balsamic Vinegar - it is a Italian vinegar that enhance the aroma and flavors in different salads.

Besan Flour- made from chickpeas, used in making Fritters (Pakora).

Cabernet - A variety of grape which is used in making wine with smooth overtones.

Café de Paris - a compound butter made with spirits, herbs, curry and spices.

Calcium - Essential mineral which is important for bone structure and teeth.

Calorie - A measure of energy derived from food.

Carpretto - Italian word mean "kid" the meat from a young goat.

Danger Zone - the temperature between 5°C and 60°C in which bacteria multiply rapidly.

Darne - A fish cutlet sliced through the bone of a round fish.

Debris the leftover 9f the food that is not shown or served to the customers.

Deep frying a cooking method in which food is submerging in hot fat on 140°C to 190°C.

Degreasing - removing the fat from stock and sauces.

E. Coli - a type of bacteria that can lead to severe bacteria.

Eclairs - length of choux pastry (6-12 cm) baked.

Economical - A term describe the profitability of any item.

Egg wash - beaten eggs used for crumbling.

Elastin - yellow connective tissue that has to be minced or chopped for eating.

Farinaceous dishes - menu items containing starch, such as rice, pasta and gnocchi.

Feathering - mixing two or more sauces for presentations.

Fennel vegetable variety with an aniseed flavor.

Fenugreek - a spice with a strong curry-like aroma and flavor.

Fermentation - the conversion of sugars and other carbohydrates into alcohol, acids, and carbon dioxide for production of beer, wine and bread.

Ganache - A mixture of hot cream and melted chocolate.

Garlic Butter - a compound butter with the addition of garlic.

Garnish trimmings add onto a dish to enhance its taste and eye appeal.

Gelatine a setting agent made from animal skins and bones.

GIGO - Garbage In Garbage Out

Gratinate - to place food item under a salamander to brown on the top.

HACCP - (Hazard analysis and critical control points) a system to minimizing the food poisoning.

Hache finely chopped e.g. parsley, mince or corriender.

Harissa Hot, spicy Moroccan sauce made from fresh chilli, coriander (seed and fresh) mint, caraway seed and garlic.

Harmonic flavors - flavors that leave a pleasant taste in the mouth and do not compete with each other.

Heat Transfer Method of conversion of heat from one thing to another.

Ice cream a frozen dessert.

Ice slurry mixture of crushed ice and water.

Icing a mixture of icing sugar with the addition of moisture, lemon juice, egg white, sour cream etc.

Invertebrates- animals without a spine.

Implements - tools used to assist your work, such as knife, cutting boards etc.

Jalousie- a French term meaning blind and shutter, a puff- pastry slice with a topping of pastry.

Jam a preserved mixture of fruits and sugar.

Jarish crushed wheat and yogurt casserole.

Jasmine rice a type of long grain rice

Jell to congeal a substance.

Kumara - red sweet potato with a pinkish orange flesh.

Ketchup- a thick sweet and spicy sauce.

Key lime - a Tart, golf ball size yellow and green citrus fruit.

Kahlua - a coffee liqueur used for desserts.

Kinilaw Cuisine- a true Philippine cuisine.

Lacto-vegetarian Vegetarian diet which includes dairy but not eggs.

Larder -cold section in the kitchen.

Lavash bread - soft pocket flat bread used in Labanese dishes.

Lavosh - crispy bread pieces served with cheese.

Leek - large stalk vegetable of the onion family.

Mandoline - a tool used in the kitchen for slicing vegetables.

Maple Syrup - sap of the maple tree.

Mixing - to combine different ingredients.

Mayonnaise - a cold emulsion sauce made with egg yolks.

Matignon - a small mirepoix cut used for short cooking time.

Naan - flat, slightly leavened bread, round or oval in shape.

Nage - Aromatic poaching liquid. Can be vegetable or herb stock.

Napper- to coat or mask a food item with sauce.

Napolitaine - garnish style referring to the Italian town of Naples.

Navarin - a brown stew made with diced lamb.

Oats - a cereal grass cultivated for its edible seed.

Offal - edible parts of animal excluding the muscle meat, such as liver and kidney.

Okra - A vegetable shaped like a cylinder.

Open Sandwich - a sandwich that is not covered by a slice of bread and the filling is exposed.

Oregano -Strong herb used in Italian cooking.

Paring - trimming, as of meat or vegetables.

Paring knife - a knife used for turning, trimming and peeling.

Palatable - having appealing flavors and taste.

Pathogens - Bacteria which cause diseases.

Paysanne - a basic vegetable cut in approximately 10mm slices.

Quark cheese - is a type of cheese.

Quiche - German word means cake.

Quick bread - quick bread can be made quickly and easily.

Quinoa - a type of grain.

Ragout - a stew, as in beef ragout or ragout fin.

Raita - a mixture of yogurt, cumin, vegetables and fruits.

Ratio - the relationship on one ingredient to another such as 1:2 in pastry mean 1 part butter and 2 parts flour.

Ravioli - a variety of pasta that encases food in pastry.

Raw sugar - unrefined sugar appear much like sugar.

Sabayon - egg yolks and liquid whipped and cooked over a Bain – Marie.

Saccharometer - an instrument used to measure sugar density.

Saffron - the stamen of a crocus flower used for flavor and coloration.

Sailor style - garnish used for seafood with prawns and bacon.

Salamander - a grill operating with top heat only.

Table d'hote - a meal with no or limited choice, at a fixed price.

Tahini - a type of paste made up with sesame seeds.

Tempura - Japanese batter used for deep - fried food.

Thickening agents. - It helps to bind and thicken agent.

Thyme an herb that is used in stocks, soups, sauces and meat dishes.

Universal rules - that can't be changeable.

Univalve- a mollusc with one shell.

Utensils- tools used for cooking.

Urchins- a kind of invertebrates.

Vanilla essence Flavor produced by dissolving vanilla pods in an alcoholic solution.

Vanilla pod - The pods of a creeper.

Veal- Young beef, calf.

Vegan-a person who does not eat any meat products.

Vegetable oil - oil that is derivative of a vegetable or seed.

Wrapping sheet - a thin plastic sheet in which food is wrapped.

Wedge- shape of a potato cut on a slant with a triangle.

Wheat- the grain of cereal grass used for food.

White chocolate - made with cocoa butter with the addition of milk, solids and sugar.

Wild Rice - a native grass of North America.

Xmas pudding - English specialty, also called plum pudding, served at Christmas.

Yogurt - easily digested fermented milk product.

Yeast - microorganisms used in cooking to aerate food.

Yeast extract - a mixture of yeast, salt and vegetable extract.

Yams a root of a climber high in vitamin C and used like potato.

Zabaglione - a foam- style dessert.

Zest the rind of citrus fruits.

Zester a tool to remove zest from citrus fruits.

Zucchini - A vegetable similar to cucumber.

About the author

Mariyam Usman is a Senior food Preparation and Culinary Arts –Patisserie Principle Trainer and Owner of Business **ANAYA's PATISSERIE** with an extensive background as a Food and Nutritionist, Food Safety in Catering in well-renowned Conglomerate Companies such as Hashoo Foundation, Kitchen Cuisine, Pearl Continental, Hashoo Hunar and TDCP- ITHM. She is currently working as senior food Preparation and culinary arts-patisserie principle trainer at Tourism Development Corporation Punjab College Institute Of tourism & Hotel Management Lahore. She also owned her own Business and Member of Curriculum Development Community in **NAVTTC.** She holds a degree of Food and nutritionist and also International Diploma in Food safety in catering principles from United Kingdom. Her passions include travel and mentoring young people to develop their own professional paths.

قومی ترانہ

پاک سَر زمین شاد باد! کشورِ حسین شاد باد!
تو نِشانِ عزمِ عالی شان ارضِ پاکستان
مرکزِ یقین شاد باد!

پاک سر زمین کا نِظام قُوّتِ اُخوّتِ عوام
قوم ، مُلک ، سلطنت پائندہ تابندہ باد!
شاد باد منزلِ مُراد!

پرچَمِ سِتارہ و ہِلال رہبرِ ترقی و کمال
ترجُمانِ ماضی، شانِ حال جانِ اِستقبال
سایۂ خُدائے ذُوالجلال!

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