



Learning Objectives



- Know the definition and types of equipment.
- Have an adequate knowledge of selection of equipment.
- Understand the production and storage equipment.
- Know the significance of cleaning and maintenance of food service equipment.

A wide range of food service equipment is available in the market. Selection of the proper equipment for a food service operation is extremely important. Since equipment represents fixed asset which depreciates the moment it is purchased and installed. Equipment selection requires careful planning and decision making which determines whether the equipment is really needed for the entire operation of food service system. The success of catering business undoubtedly depends on the availability of suitable equipment.

4.1 Definition and Types of Equipment

Food service equipment may be defined as all tools, utensils, crockery and cutlery necessary for the preparation, cooking, holding, serving of food and washing.

Equipment should be designed, constructed and finished that it can be easily cleaned, disinfected safely without any specific tools.



DO YOU KNOW?

Custom Built – Equipment

Equipment that are built in accordance to the specifications of the food service organization (buyer)

4.1.1 Types of Equipment

Equipment may be divided into three categories based on their size.



▲ Plate 4.1 Large Equipment



▲ Plate 4.2 Mechanical Equipment

- Large equipment – Range, steamers, boiling pans, refrigerators
- Mechanical equipment – Peelers, pincers, mixers, refrigerators
- Small equipment – Utensils, pots, pans, bowls, spoons

Based on the mode of operation there are 3 types namely,

1. Hand Operated
2. Semi-automatic
3. Fully automatic



DO YOU KNOW?

Modular Equipment

Equipment designed with standard units and parts to perform multiple functions (Food processor, Slicer, Peeler, Cutter)

1. Hand Operated – It consists of mechanical pieces such as beaters or whisks, hand slicers which require greater effort to use than the semi-automatic types.

2. Semi-Automatic – This kind of equipment requires electric energy but



▲ Plate 4.3 Small Equipment

need to be monitored carefully. These include mixers, electric whisks, fryers etc.

3. Fully Automatic – These include sophisticated equipment with thermostatic controls and timers which can be adjusted to require time and temperature.

Semi-automatic and fully automatic types are motorized and therefore require less attention and effort to operate. Whatever may be the method of classifying equipment it is important to remember that every food service establishment will have different needs in terms of size, workers and types of equipment required. A number of multi-use equipment are also available and used in food preparation and service.

Based on the purpose the food service equipment is classified as given below:

1. Receiving and measuring equipment
Eg: Trolley and weighing scale.
2. Storage equipment **Eg:** Refrigerator, freezer, racks and shelves.





3. Pre-Preparation equipment **Eg:** Dough making machine, mixer/grinder.
4. Production equipment **Eg:** Range, Steamers and Boilers.
5. Holding and serving equipment **Eg:** Bain-marie, chafing dish, hot cases.
6. Washing equipment **Eg:** Sink, dish washer.

7. Garbage equipment: **Eg:** Garbage bins, incinerator.

4.1.2 Food Service Equipment

Different types of equipment used in different food service areas.

Receiving and Storage

- Weighing Scale
- Trolley
- Measuring cups and spoons
- Storage rack
- Cupboards/ racks
- Refrigerator
- Freezer



▲ Plate 4.4 Storage Rak



▲ Plate 4.5 Cupboard/Racks

Preparation

- Dough moulding machine
- Peeling machine
- Boiler for tea /coffee
- Mixer/ Wet Grinder
- Beater, bread slicer



▲ Plate 4.6 Coffee Maker



▲ Plate 4.7 Dough Maker

Cooking

- Modular gas
- Ranges with oven
- Fryers
- Salad maker
- Mobile cooking rotisseries
- Rice, Milk, idli steamer
- Boiler
- Double fryer



▲ Plate 4.8 Range with Oven



Holding and Serving

- Bain-marie holding and serving counter
- Food bulk trolley
- Hot food service trolley
- Tray service trolley
- Ice box
- Chafing dish



▲ Plate 4.9 Bain-Marie



▲ Plate 4.10 Chafing Dish

Washing and Garbage Disposal

- Pot washing units
- Mobile sink with drainage pipe
- Sink with drain board
- Dish washing machine
- Sink unit, mobile work table
- Garbage bins
- Incinerator



▲ Plate 4.11 Dish Washer



▲ Plate 4.12 Cleaning Tools

General points to be considered while purchasing equipment: – A thorough knowledge on the equipment is required for this task and can be purchased based on

- Menu
- Price
- Flexibility
- Purpose for which it is used
- Type of service offered
- Design and attractiveness
- Spare parts available for replacement
- Ease of maintenance
- Safety and space availability
- Source of supply

These basic factors help for smart selection of equipment. In simple words selecting equipment should be based on

capacity, good quality, simple design ease of cleaning and budget availability.

The work areas are essential to perform various activities in food service operation. The flow chart (Figure 4.1) shows the work areas in food service outlets.

The equipment commonly needed for the work areas determine the success of food service operation.

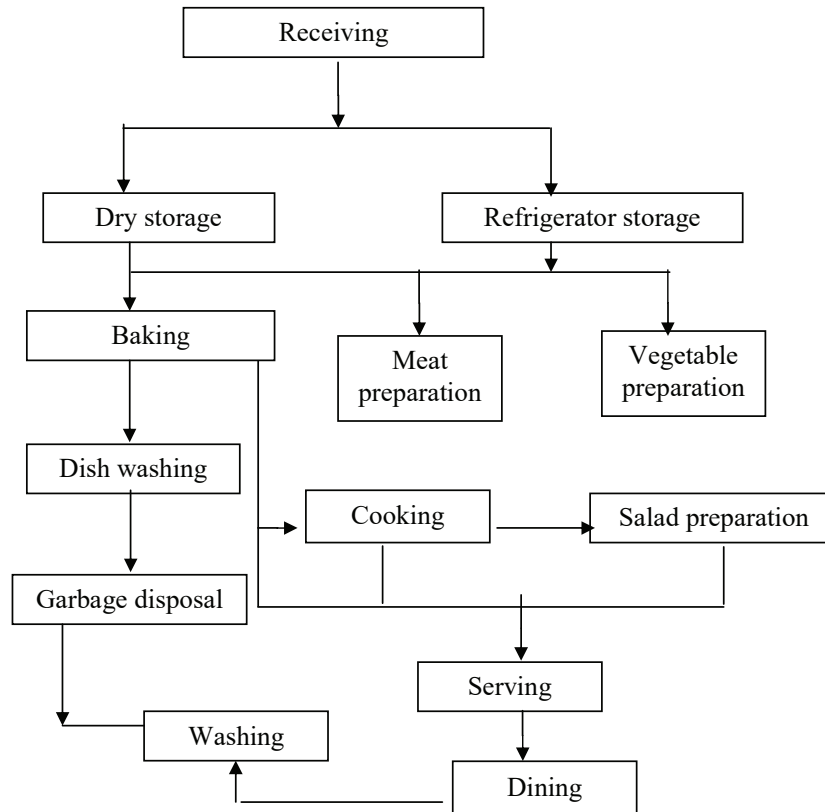


DO YOU KNOW?

Lead Time

It is the time period between the order of equipment to a manufacturer and delivery of the equipment at a food service operation.





▲ Figure 4.1 Work Areas

4.2 Receiving Equipment

It includes weighing scales, thermometers, lactometer, dollies

1. Weighing Scales

There are two types of scales.

Platform scale – weighs large boxes.

Counter scale – weighs smaller boxes and other small quantity of food items.



▲ Plate 4.13 Weighing Scale

2. Thermometer

It is used to check the temperature of food while receiving whether they are at refrigeration or frozen temperatures for cold cuts of meat and so on.



▲ Plate 4.14 Thermometer

3. Lactometer

Purity of milk can be tested by using lactometer.



▲ Plate 4.15 Lactometer

4. Dollies

They are used to move items from the receiving area to the storage area. They make work more efficient and alleviate the heavy weight of items.



▲ Plate 4.16 Dollies

4.3 Storage Equipment

The first principle to storage is to know what, where, when it is needed by the

user. Food service operations store raw or cooked ingredients for different lengths of time and at different temperatures to preserve their wholesomeness till required for preparation and service.



▲ Plate 4.17 Storage Equipment

Storage helps to minimize material handling and helps to maintain compactness in work section by limiting the volume stored.

The food items purchased should be stored properly in first sequence to avoid food spoilage, pilferage and labour. Products piled without any logical arrangements may be subjected to loss in addition to posing safety hazards. It is advisable to set limits on the number of



▲ Plate 4.18 Storage Bins



persons who have access to storage areas. Storage areas should have easy access from the receiving area and from the preparation and production area. Storage areas should be clean, well ventilated and dry with adequate space for a smooth flow of work.

4.3.1 Types of Storage

In any type of food service operation three different storages are essential.

1. Dry storage
2. Refrigerated storage
3. Frozen storage

1. Dry Storage

Foods normally stored in dry storage include rice, dhal, flour, sugar, spices and canned foods. Normal room temperature for dry storage area should range from 10° to 21°C. Care should be taken to see that there is enough air circulation with adequate ventilation and desired humidity. The food products should not be affected in any way by being exposed to direct sunlight near fire places, drainage or other utility pipes. Storage areas should be kept clean by following regular cleaning schedules.

i Shelving Units

Shelving units are used to store various dry goods prior to use.

Different types of shelving units are as follows

- 6 feet tall stainless steel wire shelving units.
- Corner shelves
- Overhead shelves
- Shelves designed to hold canned goods



▲ Plate 4.19 Shelving Units



▲ Plate 4.20 Shelving Units

ii Speed Rack

It is made of metals and have slots into which food handlers have slide sheeting pans. Heights of the shelves can be adjusted depending on the need.

2. Refrigerated Storage

A refrigerated storage is a storage space planned and maintained at a temperature between 0°C and 4°C. It can be in the form of a complete room (walk in cooler) or a cabinet which is free standing or fixed on the wall.

Refrigerator storage is used for storing raw and cooked food. Care should be taken



▲ Plate 4.21 Refrigerator Storage



▲ Plate 4.22 Roll in Refrigerator

that there are no leakages from the containers in which these items are placed. It is not advisable to store hot items in refrigerated storage as it may take a long time for them to reach the cold temperature.

In order to store the perishable foods in the cold temperature in food service operation there are three types of refrigerators available namely,

- Walk-in refrigerator
- Reach-in refrigerator
- Roll-in refrigerator

3. Frozen Storage

The most perishable foods like milk and milk products, cakes, meat and fish are placed under frozen storage. Many items are readily available in the market in the frozen form making it important for a food service operation to have adequate frozen storage. Freezer space is also needed to store large quantities of items purchased.



▲ Plate 4.23 Freezer

4.4 Production Equipment

Production involves pre-preparation and preparation.

4.4.1 Pre-preparation

Quantity food production depends upon correct weights and measures. In order to obtain a standard product with a standard yield, it is essential that food should be weighed and measured accurately. A set of scales, measuring jugs, standard measuring cups and spoons can be used.





Learning how to measure ingredients is essential for any preparation. Being well versed with all measurements eases any preparation.

All foods have to be prepared before cooking and serving **Eg:** washing, peeling, cutting, grinding. Each process requires good skills.

1. Tools for Measuring:

The three basic tools of measurement includes:

Measuring spoons – Includes tea spoon, table spoon



▲ Plate 4.24 Measuring Tools



▲ Plate 4.25 Measuring Spoons

Dry measuring cups – They are usually made of glass, stainless steel, aluminum or plastic and have even rim.



▲ Plate 4.26 Dry Measuring Cups



▲ Plate 4.27 Liquid Measuring Cups

Liquid measuring cups – These cups have pour spouts and handles which help in adding the liquid ingredients like milk, water and oil.

Measuring Tips

- Do not measure over mixing bowl
- A pinch is smaller than a dash (1/16 tsp)
- Measuring by weights rather than by volume is much more accurate.

2. Tools for Stirring, Dipping and Turning: It includes spoons, ladles, turners, spatulas and tongs.

3. Tools for Blending: Mixer is an important labour saving electrically operated piece of equipment for multipurpose use. For example, mixing pastry, cakes, mashing potatoes, beating egg, mincing or chopping meat and vegetable, beating butter, whipping cream and dough-wet dry. Blenders



are used to grate, chop or puree. The food cutter may be purchased with added feature for slicing, grinding and cubing.

4. Food Slicers and Peelers: When portion control is stressed the slicer will determine the amount to be sliced. Peelers are used to peel potatoes and other root vegetables with minimum waste by action on a revolving abrasive disc.

5. Miscellaneous Tools: Strainers, cutting board, rolling pins and knives are included. Knives like paring, utility, carving, slicing, butcher knives and cleavers are used.

4.4.2 Preparation

The equipment needed for preparation and cooking large quantities of food are given below:

1. Boilers

Many types are available in different metals and size. They may be heated by gas, electricity or steam from the main supply. The advantage of boilers is that they do not allow the food to burn.



▲ Plate 4.28 Boilers

Types of Boilers

There are three types of boilers namely

- i. Pressure boiler – Boils rice
- ii. Automatic boiler – Boils food at intervals
- iii. Bulk boiler – Large quantities of food boiled at a given time



▲ Plate 4.29 Bulk Boiler

2. Steamers

They are sealed compartments where steam is allowed to come in direct contact with the food for cooking. Steaming ovens that work from a main steam supply needs little maintenance. This type of equipment is usually fitted with a gauge which registers



▲ Plate 4.30 Steamer



▲ Plate 4.31 Steamer

steam pressure. It also has a overflow valve which gives a warning whistle if the pressure reaches danger point. These should be periodically checked to ensure that they are working correctly. A constant supply of water should be maintained in the steam generating tank. Steamer trays inside the steamer should be cleaned and rinsed. They are ideal for vegetable cookery because they retain the colour and texture without undue shrinkage.

3. Range

A range (also called a stove top) is a large appliance where surface burners are used to cook food. It is favourable for operation that features to cook the menu items ordered by the customer. It gives intense heat which can be regulated and large quantities of food can be cooked. A variety of range designs are available including solid tops, open tops and grilled tops. The pots and pans used should be heavy bottomed. After each cooking cycle the equipment should be turned off.



▲ Plate 4.32 Range

4. Oven

An oven is an enclosed cabinet where food is cooked by dry and hot air. The entire electric oven is fitted with an on-off switch which operates the oven. Once the oven is switched on and the temperature is set, it maintains the desired temperature. The lower compartment is loaded with food which is put on evenly spaced shelves and baked.



▲ Plate 4.33 Oven

5. Hot Plate

It is used as a tawa for the preparation of chappatis, dosas and pan cakes.





▲ Plate 4.34 Hot Plate



▲ Plate 4.35 Hot Plate

6. Tilting Pan

It is a deep edged pan in which the food is braised, stewed or cooked. When the food is cooked, tilt the pan and remove the food.

4.5 Holding and Serving Equipment

Holding equipment are those which keep the cooked food either hot or cold as needed and are important for serving food for large number of people at a time.



1. Hot Holding Cabinet

A heavily insulated cabinet designed to hold food hot either in pans or racks in the interior. A thermostat controls the temperature. Hot cupboards may be heated by gas, electricity or steam. The tops of most cupboards are used as serving

counters and should be heated to a high temperature than inside.

2. Bain-Marie

The term 'Bain-marie' refers to both the water bath and the inserts that hold food above the water bath. Hot water bath keeps food items warm. It heats food evenly. It can also be used as a steam table to hold hot foods.

3. Steam Table

It is an open top table with heated wells filled with water to keep foods hot for service. Foods are placed in hot pan and the pans are placed on the top of the table. A pan made of stainless steel is used to cook, serve and hold food. Foods should be covered to prevent heat loss.

4. Utility Carts

Utility carts make the transporting of food, equipment or other items from one area to another easier and faster. They are made of stainless steel equipped with heavy duty wheels.

5. Insulated Carriers

It is an insulated container made up of heavy poly urethane or plastic material designed to hold pans of hot and cold foods.

4.6 Care, Maintenance and Sanitation of Equipment

All equipment large or small, heavy or light requires care in handling to extend its life to the maximum and to minimize depreciation and maintain in a reasonably attractive and efficient condition while in use.



Table 4.1 Service Equipment, its Uses and Storage Area

S.No.	Name	Uses	Storage Area
1	Trays	For transporting cutlery, glass ware, hollow ware dishes	Side boards
2	Water jugs	For the service of water	Side boards, pantry
3	Platter	For transporting food to the guest table	Hot plate/pick up counter
4	Coffee pot/Tea pot	Tall slender pot to hold coffee/tea	Still room
5	Sugar bowl	To hold sugar cubes/granulated sugar	Side board/still room
6	Fruit stand	To display fresh fruits	Still room/main kitchen
7	Salad bowls	Wooden/glass/bamboo bowl to dress/serve salad	Salad section
8	Ice cream scoop	To scoop out and serve ice cream	Pantry/still room
9	Bread basket	Cane basket for holding bread rolls/ bread	Hot plate/pick up counter
10	Chafing dish	To keep food warm during service by using fuel	Pantry

General Care of Equipment is Given Below:

- Keep all equipment clean
- Wash removable parts of equipment with suitable detergent and hot water after each use. After washing, wipe equipment completely dry before replacing.
- Check that all pieces are in working order.
- Close supervision at work is necessary to ensure careful handling.
- Repairs must be attended without delay to prevent damage.
- A weekly, fortnightly or monthly programme for oiling or servicing the equipment to maintain movable parts or machinery in order is important.
- All the electrical inputs to the equipment should be checked periodically to ensure the proper electrical load is available for efficient functioning.
- Insulations, plumbing and other

connections need periodic check to keep equipment running at optimum efficiency.

- Make full use of warranty periods to help and train organisation staff to learn regular maintenance procedures from the manufacturers and engineers.
- Assign the care of each machine to one responsible person. Money, time and effort spent on care helps to maintain equipment in continuous working order.

4.6.1 Equipment Cleaning

- All equipment coming in contact with food should be kept clean.
- They should be scrubbed, cleaned with detergent and rinsed with potable water.
- Dipped in hot water at least for 30 seconds and then dry.
- Parts of blender and mixers should be inspected after cleaning.
- Use separate cutting board for different foods (for vegetarian and non vegetarian)



- Prepare raw food in separate area.
- Clean and sanitize equipment, utensils, work space after preparing each food.
- Use specific containers for various food products
- Use clean cloth or paper towel for wiping spills

4.6.2 Preventive Measures to Exclude Entry of Insects

Filling cracks and fissures in the walls and flooring

- Covering drain holes, with wire gauze
- Spraying or dusting with pesticide
- Fumigation in large godowns.



DO YOU KNOW?

Exhaust Hood/Ventilator Hoods

Device with mechanical fan that hangs above the cooktops to remove airborne grease, combustion products, fumes, smoke, heat.

4.6.3 Cleaning Tools

Sanitation is a quality aspect that requires alert vigilance. It limits possible exposure to contamination.

Food service equipment of various qualities are available to meet the requirements of different styles of catering operations. The menu forms the basis for identifying the requirement of service equipment. Though different types of service equipment may be procured for dishes and drinks offered for sale, using multipurpose equipment not only saves

money but also reduces storage space and maintenance cost. Purchasing of equipment is a managerial activity which calls for careful and wise decisions since it involves major capital investment. Every piece of equipment chosen must be justified and it should not remain idle.

Equipment must be maintained and handled carefully since poor handling leads to additional costs. Adequate training should be imparted to employee for proper handling of equipment. Too much of stock occupies more storage and involves additional cost and too less of it affect the operational efficiency. Hence it is important to strike a balance between these two and have just the right amount of service equipment.



▲ Plate 4.36 Cleaning Accessories

All equipment must be left clean after use. When sanitation of equipment is not effective in food production and while serving, food poisoning and food infections might occur and food service will lose its customers. Hence cleaning and sanitation operation should be verified on regular basis and it forms an important step in food service.



Key Words

- | | |
|--------------------------------|---|
| 1. Perishable | : Food that is spoiled easily |
| 2. Semiperishable | : Food that stand for a few days |
| 3. Non-perishable | : Food that stand for a long period |
| 4. Bain-marie | : Hot water bath meant to keep food item warm |
| 5. Utility carts | : Used for transporting food |
| 6. Chafing dish | : To keep food warm during service |
| 7. Thermometer | : Helps to check the temperature |
| 8. Lactometer | : To test the purity of milk |
| 9. Dollies | : Used to move items from one place to another |
| 10. Hot holding cabinet | : Hold food hot in pans |
| 11. Range | : Stove that can be used for cooking, grilling and baking in bulk |

Linkages

<https://www.youtube.com/watch?v=rTbZyZANI80-> - Minimum Equipment Requirements for a Restaurant Set Up

<https://www.youtube.com/watch?v=RAFMIXPq9BE> - Cleaning and Sanitizing

Student Activity

- List and evaluate storage equipment in terms of
 - a. Convenience and adequacy for use
 - b. Safety for supporting load limits
 - c. Cleanliness and sanitation
 - d. Appropriateness of cost on the basis of suitability, convenience and durability
- Classify foods in terms of storage needs and volume and time to be stored.
- Evaluate in terms of adequacy, extra needs or surplus
 - a. Equipment
 - b. Labour

Teacher Activity

Visiting a nearby food industry/restaurant and make the students to find information on the following equipment.

- Receiving
- Storage
- Production
- Holding and serving



Questions

I. Choose the correct answer

1. Hand operated equipment is
 - a. Freezer
 - b. Beater
 - c. Mixer
 - d. Coffee kettle
2. Weighing scale is a equipment
 - a. Receiving
 - b. Production
 - c. Holding
 - d. Storing
3. Storage is of types
 - a. Five
 - b. Four
 - c. Two
 - d. Three
4. equipment is used for making chappaties, dosas and pan cakes
 - a. Hot plate
 - b. Tilting pan
 - c. Oven
 - d. Range
5. For transporting food from one area to other area is used
 - a. Utility cart
 - b. Hot holding cabinet
 - c. Tilting pan
 - d. Trolley
6. is a type of holding equipment
 - a. Boiler
 - b. Peeler
 - c. Bain-marie
 - d. Moulding pan
7. keeps food warm during service by using fuel
 - a. Chafing dish
 - b. Salad bowl
 - c. Platter
 - d. Utensils
8. Steamer, boiling pans come under equipment
 - a. Service
 - b. Mechanical
 - c. Small
 - d. Production
9. Rice comes under food
 - a. Perishable
 - b. Non-perishable
 - c. Semi-perishable
 - d. None
10. are used to move items from the receiving area to the storage area
 - a. Dollies
 - b. Scales
 - c. Counter scale
 - d. Bins
11. are designed to hold canned goods
 - a. Shelves
 - b. Racks
 - c. Stand
 - d. Closed racks
12. is water filled tables to keep food hot
 - a. Steam table
 - b. Steamer
 - c. Hot plate
 - d. Range





13. is used for mixing pastry

- a. Mixer c. Mincer
- b. Grinder d. Grater

14. Equipment used to transport food to the guest table is

- a. Platter c. Trolley
- b. Dish d. Utensils

15. Filling cracks and fissures in the walls and flooring prevents

- a. insects entry
- b. spoilage
- c. fumigation
- d. soiling



II. Write in 3 lines (3 marks)

1. Define equipment
2. Classify equipment according to the size?
3. Write short note on range.
4. What is Bain-marie?
5. Thermometers – Explain.
6. What are the types of refrigerators?
7. List the three important features of dry storage.
8. Identify the uses of receiving equipment?

9. State 3 factors to be considered while selecting equipment
10. List out measuring equipment.
11. Write a note on any three special equipment and their uses?
12. Mention any three criteria for selection of equipment?
13. Write short note on oven.
14. Indicate the types of boilers?
15. How will you take care of the equipment?



III. Write in a paragraph (5 marks)

1. Write any 5 points for care of the equipment?
2. Mention about measuring and storage equipment
3. List out the factors to be considered while purchasing the equipment (any five)

4. Explain cold and dry storage
5. Write about any two production equipment.
6. Do you know about Bain-marie? Discuss.
7. Justify the significance of cleaning equipment
8. How will you prevent the entry of insects?



IV. Answer in detail (10 marks)

1. Bring out the guidelines for general care and maintenance of equipment.
2. Analyse the need for receiving equipment in a luxury hotel.
3. What is storage? Write in detail about its types.

4. Explain in detail about production equipment.
5. List out special equipment and their uses.
6. Describe the different types of equipment on the basis of mode operation.

