GOVERNMENT OF TAMIL NADU

HIGHER SECONDARY FIRST YEAR

VOCATIONAL EDUCATION

FOOD SERVICE MANAGEMENT

THEORY & PRACTICAL

Untouchability is Inhuman and a Crime

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Preface

Food today is more than the basic need and Food service Management is the need of the hour. This book for Class XI vocational students attempts to introduce **Food Service Management at the Higher Secondary Level**. The book is an eye opener to students who have interests and acumen to create new food and also manage food service operations. The units in the book focuses on food service operations, basics of food, equipment used, production techniques, cuisines, bakery, food preservation, food hygiene and sanitation and attitudes and personalities, essential for a person working in the food industry.The vision of this book is to bring awareness regarding the hospitality industry which is growing bigger everyday and which has definite future prospects.

The format and language are simple and explains seemingly difficult concepts clearly with the help of figures, tables and illustrations. The activities assigned will provoke the students to clarify the principles and prepare themselves for self-employment.The special features of the book is that it extends the learning journey from the book to internet and provides a wholesome learning experience,which in turn will facilitate peer learning, build self-confidence, team spirit and leadership qualities among the students.

Besides photographs addition of information in boxes called "**Do you know**?"and "**ICT corner**"make the book more interesting. The provision of "**QR code**"and "**Linkages**" will help the students to have digital access for learning. The book promotes skill by **Doing** rather than **Memorizing**.

The additional reading materials and videos will help students to probe and collect information on their own. Enhancement of learning food service management principles and skills will enable the students to meet the demands in this profession. For all young aspirants who wish to set up their own food units or associated outlets, this book will be of great help and a valuable guide providing a profitable self-employment opportunity.

How to use the Book

Learning Objectives	Learning objectives are brief statements which explores what students are expected to learn in Food Service Management vocational stream by the end of Class XI.
Chapter Content	A brief overview of each chapter has been mentioned.
Do you know	Amazing facts and ideas to supplement the students' thinking and question.
Activity	Directions are provided for teachers and students in order to explore and enrich the concepts to create innovative ideas.
Evaluation	Assess students and guide them effectively.
QR Code	Encourage the students to further browse the content through digital access in learning.
Tables and Flow Charts	The diagrams and schematic presentations of the content provides a bird's eye view of the concepts.
Career Corner	List of professions particularly related to the food related industry.
References	List of related books for further details on each topic.
Weblinks	Digital resources for extended learning.
Exam Questions	Model questions to prepare the students for final exam.

SCOPE OF VOCATIONAL COURSE IN FOOD SERVICE MANAGEMENT

- Adopting best practices to become an entrepreneur.
- Set up a small scale food preservation unit.
- Establish a bakery unit.
- Establish a snack bar/kiosk with nutritious fast foods/salads/fresh juices/ herbal drinks.
- Self confident to become an event manager to meet the needs for various events.
- Plan and develop commercial production of multi grain powders, health mixes, millet substituted powders, preserved products like vathal, vadagam, pickles, dry masala powders and salted products.
- Linking the students with experts to enhance the professional skills through possible training programme. Identify the Entrepreneurial avenues for future plan.

Professional Course

- MSME: Micro, Small and Medium Enterprises Development Institute, Chennai, Coimbatore, Tuticorin, Tirunelveli. www.chennaimsmedi.com
- TNAU: Tamil Nadu Agricultural University, Coimbatore, Madurai, Chennai. www.tnau.ac.in
- IHM: Institute of Hotel Management, Catering Technology and Applied Nutrition, Taramani, Chennai. www.shiksha.com
- EDI: Entrepreneurship Development Institute of India. www.ediindia.org.
- NAF: National Agro Foundation, Chennai. https://naf.org.

Entrepreneurial Avenues in Food Service Industry

Groups	Avenues
I. Cereals, millets and its products	■ Production of multi grain powders ■ Design convenience foods ■ Production of dry mixes for breakfast ■ Preparation of extruded food products with millets
II. Pulses and Legumes	■ Development of dry mixes for snacks ■ Production of germinated legumes
III. Milk and milk products	■ Preparation of readymade sweet mixes ■ Processing of organic ice creams
IV. Vegetables and fruits	■ Preparation of vathal, vadagam ■ Ready to serve (RTS), beverages, squash jam, preserves, jellies and herbal drinks ■ Preservation by salting and pickling
V. Nuts and Oil seeds Sugar and jaggery	■ Novel production of chocolates ■ Incorporation of nuts, chi seeds, flax seeds in designing chocolates

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9 Attitude and Personality Requirements

PRACTICAL

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2 Basics of Food

3 Selection of Foods and Methods of Cooking

4 Food Service Equipment

5 Bakery

6 Food Preservation

7 Menus and Cuisines

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E-book

R45KTR

Assessment

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DIGI links

Lets use the QR code in the text books ! How ?

- Download the QR code scanner from the Google PlayStore/ Apple App Store into your smartphone
- Open the QR code scanner application
- Once the scanner button in the application is clicked, camera opens and then bring it closer to the QR code in the text book.
- Once the camera detects the QR code, a url appears in the screen.Click the url and goto the content page.

Chapter 1 Food Service Operation

Learning Objectives

- Get an insight into the scope of food service
- Gain knowledge on various food service outlets
- Understand the functions of food service operation
- Know the general etiquettes in food service operation

1.1 Introduction to Food Service Industry

A food service institution is one which plans, prepares and serves food in quantities far greater than those characteristic of usual home meals. The growth of food service industry from ancient times like the very simple "inns" or "chathrams" has evolved into a major industry in India. Food service industry or hospitality industry is growing tremendously worldwide due to the 3'T's namely, Tourism, Travel and Trade.

A food service operation provides food and beverages basically along with accommodation or lodging facilities for a price. So this industry comes under the service category where the customer is offered not only hospitality but a wholesome dining experience.

Definition: Food Service Management is a process of managing the food service operation, a place where a traveler can get food and accommodation. Food and drinks provided in a good ambience, aesthetically for a cost-effective price to the satisfaction of a customer is the basic objective of a food service operation. Safe and tasty food with quality served in a hygienic environment is important.

Today, a number of food and beverage operations have come up but the beginnings of food service was very small. The root of food service was very much in Indian customs, habits and characteristics of civilization. In medieval times quantity food production was followed in religious orders, royal households and places of education where it was traditional in India for students to live with the teacher or Guru for their education. Historically, the evolution of public eating places was stimulated by people's desire to travel and explore, initially for spiritual enrichment for which people went on pilgrimages to holy places, followed by other goals like education, work, health, sports and

leisure. Slowly from there the food service industry has scaled up to great heights today with sophistication. The first Indian hotel founded was TajMahal Palace, a hotel in Mumbai (formerly called Bombay) overlooking the Arabian Sea.

1.2 Scope of Food Service Management

Food service management has a wide scope in the present day and in the future as well. Globalization, modern fast paced lifestyle and changing eating habits are some of the reasons for the growth of food service operations. People eating outside are increasing day by day and customers look for food which is healthy and safe.

Food service management is needed whether a food service operation is small, medium or large. Keeping these factors in mind, the scope and prospects for food service management are listed below:

- Become an entrepreneur in running a food service operation successfully.
- Manage to run a food service operation
- Establish linkages with corporates and industries to provide food **"on contract basis".**
- Manage food services in hospitals like dietaries and canteens.
- Set up food preservation and bakery units.
- Establish a snack bar/kiosk with nutritious foods like salads, fresh juices and herbal drinks.
- Become a teacher in schools and in colleges.
- Become an event manager to meet the needs of food and beverages for various events.
- Develop food products and become a food designer.
- Work in airline, railway and ship catering services.
- Design and develop new cuisines
- Create employment opportunities for many and
- Provide good and healthy food to the community.

1.3 Food Service Operations

Food service operations are broadly categorized as commercial and non-commercial.

1.3.1 Commercial

Commercial food service operations are operated as business or for a profit motive **Eg:** hotels. The types of food service operations are many to meet the demands of the customer and the following are some of the common commercial food service operations.

▲ Plate 1.1 Commercial Food Service Operation

a. Cafeteria: Cafeteria system consists of straight-line counters containing a variety of hot and cold dishes. The customers pick up a tray and move along and select the dishes. The cashier at the end of the counter makes the bill for items selected

▲ Plate 1.2 Coffee Shop

and collects payment. In India, in most cafeteria operations guests make payment at the cash counter before hand for items they want to eat.

The tables have the basic requirements such as salt and pepper, straw holder, napkins and water glasses. Cafeterias are situated in railway stations, cinema halls, shopping complex and in premises of office, school and college where guests expect quick service.

b. Coffee Shop: It may be an independent outlet or situated in a restaurant. It mainly serves snacks and beverages 24 hours a day. The service and ambience are informal.

The furniture and service equipment are not very expensive. Dishes ordered by the guests are neatly plated in the kitchen, garnished and placed before the guests.

c. Kiosk: A kiosk is a small permanent or temporary structure on a side walk. Here items like coffee, tea, chocolates, pastries and savories are sold. The items bought may either be taken away or consumed at tables arranged nearby. Most kiosks do not have seating provisions.

▲ Plate 1.3 Kiosk

d. Meals on Wheels: The concept of 'Meals on wheels' was developed in the United Kingdom during World War II. It was in 1943 when food was delivered to servicemen, in old prams using straw bales to keep the meals warm in transit. The invention of meals on wheels which started as a voluntary programme has reshaped and taken a new dimension of becoming a profit-making business in recent times. This idea has been improvised in the modern day.

DO YOU KNOW?

Motels

A hotel on a highway is called a Motel or "Motor Hotel". It has parking facilities along with restaurant.

Food that is cooked in a centralized kitchen is supplied to homes, offices, hospitals and to elderly people who live in a community in separate homes. Now-a-days restaurants supply food by taking orders from customers on wheels. Meals are also prepared in centralized kitchens and supplied in buses, trains and flights.

Assorted snacks and main meals are prepared elsewhere and transported by vehicle to a central point and served.

This type of outlet moves from place to place or stationed near busy areas.

e. Airport Lounge: Airport lounge has a wide menu for breakfast, lunch, and dinner with hot and cold beverages, salads, main meals, and desserts. It also has formal ambience, appealing for having meals at leisure and resting gracefully at the airport. The traveler selects food and beverage of choice, and takes to the table himself.

▲ Plate 1.4 Flight Catering

f. Family Restaurant: Family restaurant has elaborate menu of single or multiple cuisines which may change according to the operating hours. They have good ambience and comfortable seating arrangements so that the guests can dine leisurely.

g. Fast Food Outlets: Fast food outlet has limited menu of hot and cold beverages with easily prepared and fast meals cooked in advance and kept warm. The service must be speedy. The food is prepared in the kitchen, placed in the trays, and passed to the customer.

h. Food Court: Food court consists of multi-cuisine menu. Multi-cuisine food outlets are located around with central dining. The customers pick up food and beverages of their choice from multiple outlets around and sit in the central dining area to consume. This type of food service can be seen in shopping malls.

i. Theme Restaurant: Theme restaurants have limited menu that is based on the theme. Architecture, lighting, and music

▲ Plate 1.5 Family/ Casual Dining Restaurants

▲ Plate 1.6 Fast Food Outlet

▲ Plate 1.7 Food Court

induce the feel of the theme. Mostly informal ambience is maintained with various other interior decorations.

DO YOU KNOW?

Star Rating of Hotels
It is a system of rating hotels from 1 star to 7 star based on the amenities, luxuries, overall hospitality and services.

Robot Theme Restaurant: Introduction of novel ideas in production and service has taken the industry to great heights. New themes with specialized services have taken a new momentum these days. The advancement of technology has seen

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DO YOU KNOW?

Vending Machines
They are automated machines that are designed to provide items like chocolates, snacks and beverages after coins or special cards are inserted into them.

▲ Plate 1.8 Robot Service

online service of food, ordering through iPads in restaurants and the use of robots to serve foods. Currently in India, the first Robot theme restaurant with robots serving food to the guests at the table has emerged in Chennai.

1.3.2 Non-Commercial

Non-commercial food service operations could be defined as operations including colleges and universities, healthcare, industries, military, day-care centres, orphanages and old age homes which give free food and accommodation. This segment prepares, serves food and supports some other establishment's main function or purpose. For example, the cafeteria in a university supports the goal of educating students by serving them meals so that they have the energy to participate in class and other activities. Within the noncommercial segment, food service is typically handled either by contractors who will manage and operate the food and

dining facilities or which is self-operative, which means the institutions hire their own staff to operate food services.

a. Welfare Catering: The provision of food and beverages to people to fulfill a social obligation is known as welfare catering. It includes catering in hospitals, schools, colleges, the armed forces and industrial catering. In hospitals, the patients are given nutritious food at a reasonable price so that the convalescence period is not too long.

Schools and universities provide on-campus food services to students and staff. Students stay as residents in school hostels and eat from the mess or school food service.

▲ Plate 1.9 Welfare Catering

▲ Plate 1.10 School Food Service

b. Industrial Catering: The provision of food and beverages to 'people at work,' in industries and factories at highly subsidized rates is called industrial catering. It is based on the assumption that if employees are fed better they are happy and more productive. Food is given at a concessional rate.

▲ Plate 1.11 Industrial Catering

1.4 Functions of Food Service

A successful food service includes specific components organized in a particular pattern to optimize performance and efficiency based on the food and beverage they offer. But in most food services the following functions are carried out:

- Cleaning/washing.
- Storage.
- Food Preparation.
- Service.

a. Cleaning/Washing: The cleaning and washing section is first because every place in the food service should be clean and hygienic for ensuring safe food and water. This section should be located near the kitchen entrance so servers can quickly drop off dirty dishes and chefs can quickly find clean dishes.

▲ Plate 1.12 Cleaning

▲ Plate 1.13 Washing

b. Storage: The storage area can be split into non-food storage and food storage. The non-food storage area can be split further into a section for disposable products, a section for cleaning supplies, and a section for the clean dishes in the cleaning/washing area. This area might also contain a receiving area for product deliveries. Food storage area is divided into cold and dry storage.

c. Food Preparation: The food preparation area is very important in food service because the maximum work is done here and the menu is transformed into tasty

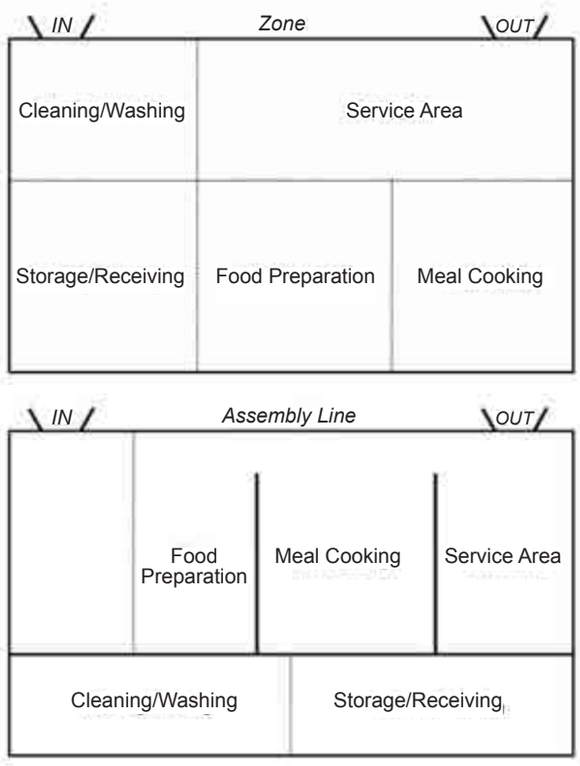
▲ Plate 1.14 Storage

dishes. An area for prepreparation and an area for the actual production are needed. In large establishments the food production area may be broken into smaller sections like a baking section, grilling section, and frying section. Sometimes if multicuisine is offered then the production area may be divided as Indian, Chinese and so on.

▲ Plate 1.15 Preparation

d. Service: The service area is the final section of food service but the most important and the first one the guests see. So this area should be furnished well with good décor. The following diagrams (Fig. 1) give an idea how the different sections in food service can be ideally planned.

▲ Plate 1.16 Service



▲ Fig.1 Different Sections in Food Service

1.5 General Etiquettes in Food Service Operation

The guest or the customer is the most important person in a food service operation and there are certain general rules or etiquettes to be followed so that the customer is satisfied. The following are some basic etiquettes:

Do's

- Receive the guests with smile as soon as they enter the restaurant.
- Wish them good morning, good afternoon, good evening, and good night based on the time of the day.
- Help the ladies to sit by pulling the chair.
- Serve water as soon as guests are seated.
- Present the menu card.
- Help the children below 5 years with babysitting chairs.
- Take orders of food from the guest, who will pay the bill.
- Inform the guest the time required to serve the food.
- Serve preplated food from right hand side and if not preplated to serve individual items from left hand side.
- Be attentive to guest's tables.
- Fulfill the requirements of the customers quickly.
- Clear the used or soiled plates from the right side of the customer.
- Present the bill.
- Accompany the guest to the door politely and send them off.
- Then clear and reset the table.

Don'ts

- Do not interrupt when the guests are taking food.
- Do not over hear conversation.
- Do not argue with the guests even though they may be wrong.
- Do not touch hair or nose, mouth while in service.
- Do not solicit for tips.

Key words

Entrepreneur : An individual who runs a small business, assuming all the risks and rewards of the venture.

Ambience : A feeling or mood associated with a particular place/character of atmosphere

Beverage : It is a liquid intended for human consumption

Lounge : A public waiting area in a hotel's lobby

Cafeteria : Patrons wait on themselves, carrying their food to tables from counters where it is displayed and served.

Linkages

https://www.youtube.com/watch?v=7HcaObhA82I - How to Operate a Successful Restaurant
https://www.youtube.com/watch?v=QpYX4GfSiH - AFood Costs Formula: How to Calculate Restaurant Food Cost Percentage
https://www.youtube.com/watch?v=dCKDAzwqe-M- Motor Hotel- 2 Star
https://www.youtube.com/watch?v=dBf6BTX1bmM - Safety Training

Student Activity

- List the commercial and non-commercial institutions in nearby area.
- Give a case study of any one of the commercial and non-commercial food service institutions you have visited.

Teacher Activity

- Demonstrate a role play of receiving a guest and serving.

R4NCX2

Questions

Choose the correct answer

1. The three T's due to which food service industry emerged was .....
   a. Travel, Tourism, Treatment
   b. Travel, Tourism, Trade
   c. Travel, Technology, Trade
   d. Travel, Treatment, Technology

2. ..... is a commercial food service establishment
   a. Hotel
   b. School canteen
   c. Hospital catering
   d. Noon meal programme

3. ……is a non-commercial food service
   a. Hotel
   b. School canteen
   c. Cafeteria
   d. Kiosk

4. Food service carried out on mobile carts is called ……
   a. Industrial catering
   b. Meals on wheels
   c. Cafeteria
   d. Kiosk

5. A …….. is a small permanent or temporary structure on a side walk
   a. Coffee shop
   b. Hotel
   c. Cafeteria
   d. Kiosk

6. ……. is offered in a restaurant
   a. Waiter service
   b. Self service
   c. Token service
   d. Waiter and self service

7. Storage area is best located near a……. in a food service
   a. Kitchen
   b. Food service area
   c. Washing area
   d. Security area

8. The first step of etiquette in a food service should be ……
   a. Receive the guests with smile
   b. Table setting
   c. Flower arrangement
   d. Music

9. One of the bad etiquette in a food service is ……
   a. Receiving guests
   b. Greeting guests
   c. Presenting menu card
   d. Soliciting tips

10. The most important area and the first one the guests see in a food service operation is ……
    a. Cleaning area
    b. Reception area
    c. Storing area
    d. Service area

II. Write in 3 lines (3 marks)

1. Define food service management.
2. Mention the three 'T's responsible for the growth of food service industry
3. Write a note on Airport lounges.
4. What do you mean by Kiosk?
5. Give the objectives of a commercial food service operation
6. Enumerate any three welfare catering-sectors.
7. Indicate any 3 general etiquettes which should be followed.
8. Give the meaning of coffee shop.
9. Outline the characteristics of cafeteria.
10. State three functions of storage in food service.

III. Write in a paragraph (5 Marks)

1. Elaborate on theme restaurant and food court.
2. What are the characteristics of the commercial food service institutions you have observed?
3. Give an account on non-commercial food service operations
4. Outline the growth of food service industry
5. Write on Industrial catering.

IV. Answer in detail (10 marks)

1. Explain in detail the general etiquette to be maintained in a food service industry? Why it should be maintained?
2. Give a detailed account on functions of food service outlets.
3. Elaborate on the commercial food service operations?
4. Identify the scope and prospects of food service management.
5. What do you mean by meals on wheels and fast food outlets? Give your comments on these outlets.

Chapter 2 Basics of Food

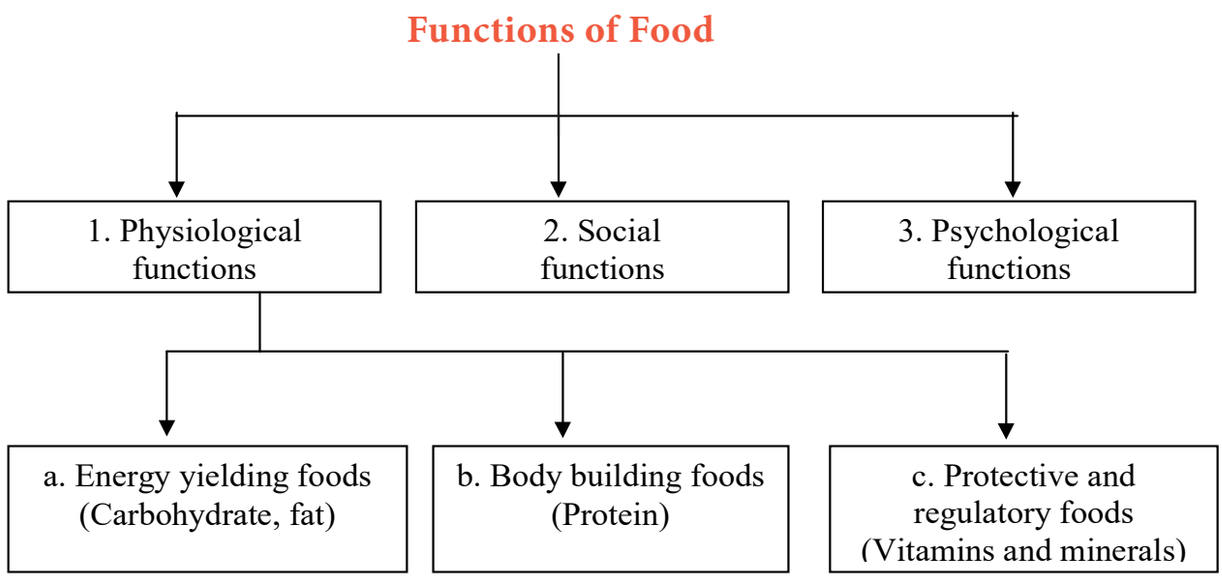
Learning Objectives

- Know about the food groups and its significance.
- Gain knowledge on food pyramid.
- Apply the knowledge on maintaining good health.
- Understand the basic principles of the preparations.

Food is an important basic need of man and is needed for growth, development and to stay healthy. Food contains nutrients that are essential for body functions and for maintaining normal nutritional status. Hence, food plays a key role in a person's physical and mental wellbeing. The nutrients like carbohydrates, proteins, vitamins and minerals not only help a person with good health but also meet the additional needs during special conditions like pregnancy, lactation and during convalescence.

2.1 Functions of Food

Food can be classified according to the function it performs.



▲ Figure 2.1 Functions of Food

2.1.1 Physiological Functions of Food

- Satisfies hunger and increases satiety value.
- Helps in maintaining normal secretion of enzymes and hormones.
- Supplies nutrients that are needed for physical growth and development, maintenance of normal body functions, physical activity and health.

▲ Plate 2.1 Functions of food

a. Energy Yielding Foods: They provide energy to perform voluntary and involuntary processes in the body. The energy needed is supplied by oxidation of foods consumed.

▲ Plate 2.2 Energy Yielding Foods

Cereals, millets, roots and tubers, fruits like banana, dried fruits, sugar and jaggery, oil, butter and ghee are energy yielding foods.

b. Body-Building Foods: Foods rich in protein are called body building foods.

Milk, egg, meat, fish contain protein of high biological value. These foods have all the essential amino acids in correct proportion for the synthesis of body tissues.

Foods like pulses, oilseeds and nuts contain protein but may not contain all the essential amino acids required for the human body.

▲ Plate 2.3 Body Building Foods

c. Protective and Regulatory Foods: Foods rich in vitamins and minerals have regulatory functions in the body e.g., maintaining the heart beat, water balance, temperature. Protective foods prevent diseases as they are rich in antioxidants.

▲ Plate 2.4 Protective and Regulatory Foods

Fruits, vegetables, green leafy vegetables, milk, egg, fish and liver serve as protective and regulatory foods.

2.1.2 Social Functions of Food

- Food is a symbol of hospitality throughout the world.
- It is a part of community, social, cultural and religious life.
- It creates a relaxed atmosphere when people are together and it is an instrument for developing social rapport.
- Food is a vehicle for expressing love, friendship and social acceptance in the events like festivals, marriage and birthday party.

2.1.3 Psychological Functions of Food

- Gives mental happiness
- Provides sense of security
- Relieves from stress and gives pleasure.

2.2 Four Food Groups and Food Pyramid

2.2.1 Significance of the Four Basic Food Groups

The four food groups can be used for the following purposes.

i) Planning wholesome, balanced menus to achieve nutritional adequacy
ii) Assessing nutritional status – a brief diet history of an individual can disclose inadequacies of food and nutrients from any of the four food groups. Based on the assessment, nutrition education can be given to an individual.

2.2.2 ICMR Basic Four Food Groups

According to Indian Council of Medical Research (ICMR) the nutrients in Basic four food groups are given in table 2.1.

2.2.3 Food Pyramid

The food guide pyramid was introduced in 1992 by United States Department of Agriculture (USDA). It is

DO YOU KNOW?

How much fluid do we need?

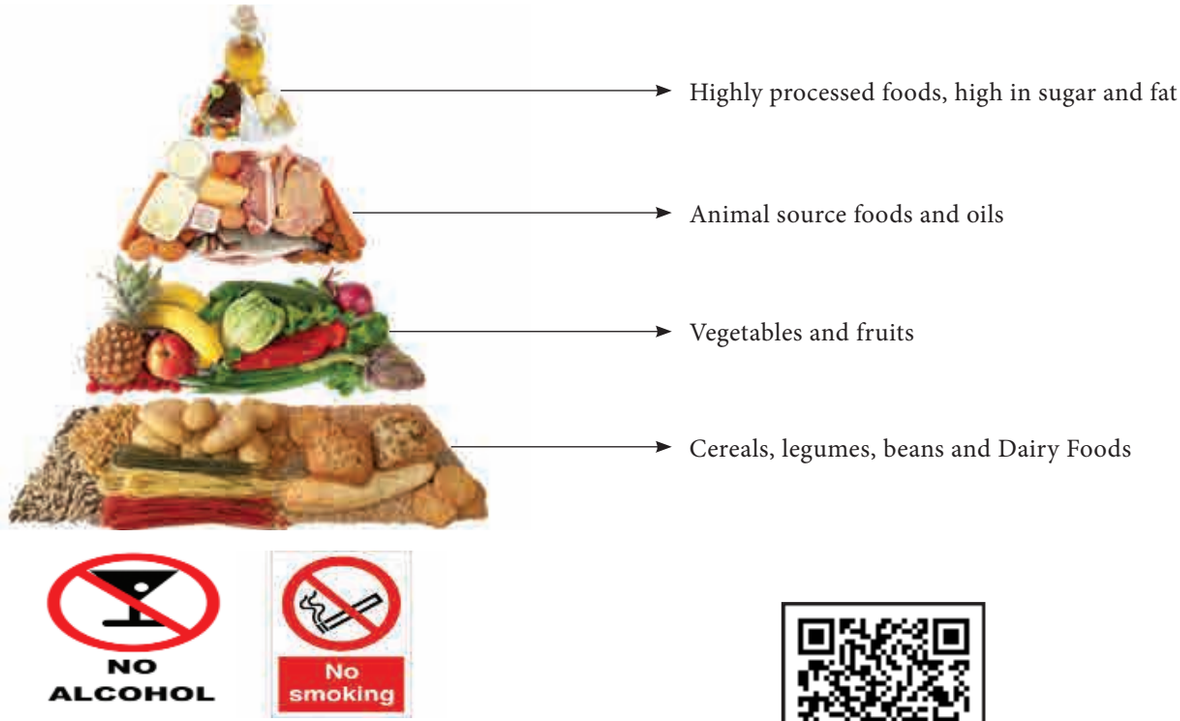
An individual should drink 1.5 - 2 litres of fluid daily to maintain healthy kidney and prevent urinary infections.

The body needs extra fluids when energy expenditure is high and also in hot weather.

Table 2.1 Four Food Groups		
S.No.	**Food Groups**	**Main Nutrients**
1	**Cereals, millets and pulses:** Rice, wheat, bajra, maize, ragi, jowar, barley, rice flakes, wheat flour, malted cereals, Bengal gram, black gram, green gram, red gram (whole as well as dhals) cow pea, peas, rajmah, soya bean, beans, horse gram and sprouted pulses	Energy, protein, invisible fat, thiamine, riboflavin, folic acid, iron, calcium and fibre
2	**Vegetables and Fruits** **Green leafy vegetables:** Amaranth, spinach, drumstick leaves, beetroot leaves, coriander leaves, curry leaves, mustard leaves, fenugreek leaves **Other vegetables:** Carrot, onion, brinjal, ladies finger, capsicum, beans, drumstick, cauliflower **Fruits:** Guava, tomato, mango ripe, papaya, orange, sweet lime, water melon, grapes, amla	 Carotenoids, riboflavin, folic acid, calcium, iron, fibre Carotenoids, folic acid, calcium, fibre Carotenoids, vitamin-C, fibre
3	**Milk and milk products, egg, meat and fish** **Milk and Milk Products:** Milk, curd, skimmed milk, cheese **Egg** **Meat:** Chicken, liver, mutton **Fish**	 Protein, fat, riboflavin, calcium, High biological value protein, vitamin A Protein, fat, vitamin-A, cyanocobalamin Omega3 Fatty acid, Vitamin A & E
4	**Oils & fats and nuts & oilseeds:** Butter, ghee, hydrogenated fat (vanaspathy), gingelly oil, groundnut oil, mustard oil, coconut oil Ground nuts, Gingelly seeds, Cashew nuts, Almonds	Energy fat, essential fatty acids, fat soluble vitamins

Source: Nutritive Value of Indian Foods, National Institute of Nutrition, ICMR (2017)

a valuable tool for planning a health promoting diet. The food pyramid (Figure 2.2) provides recommendation for the number of daily servings that should be consumed from each of the food groups. Food pyramid clearly represents that cereals should form the major bulk of the diet followed by fruits and vegetables, pulses, milk and meat products and less amount of sugar and oils. Food pyramid helps an



▲ Figure 2.2 Food Pyramid

R4X8YP

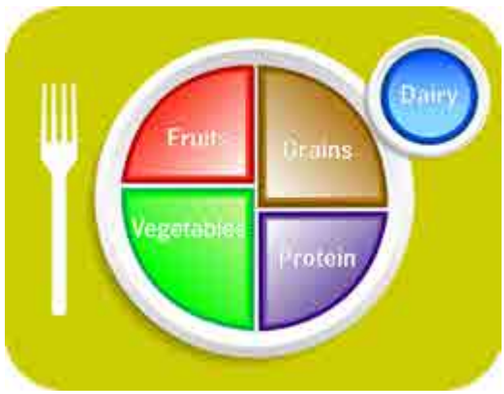
individual to choose favourite foods by incorporating the principles of balance, variety and moderation.

The table 2.2. shows the quantity of food recommended for adolescents.

Table 2.2 Portion Size of Foods for Adolescents

Food groups	Portion size (g)	Number of portions	
		Girls	Boys
Cereals and millets	30	10	14
Pulses	30	2	2
Milk	100	5	5
Roots and tubers	100	1	2
Green leafy vegetables	100	1	1
Other vegetables	100	1	1
Fruits	100	1	1
Sugar	5	6	7
Fats and oils	5	5	5

Source: Nutritive Value of Indian foods, National Institute of Nutrition, ICMR (2011)



▲ Plate 2.5 Balanced Meal

DO YOU KNOW?

An Ancient Remedy

In India, toasted fennel seeds are chewed after eating to prevent bad breath and to help digestion. In Rome, fennels are eaten to prevent obesity.

It is also recommended to stimulate milk production. A teaspoon full of boiled, cooled, weak fennel tea can be used as gripe water for infants.

2.3 Herbs for Good Health

"Let Medicine be thy food and Let Food be Thy Medicine"

Hippocrates, 400 B.C

Food acts as a therapeutic agent in healing sickness/disease and maintaining health. It allows body to function properly. Points to be kept in mind to maintain health are given below:

▲ Plate 2.6 Medicinal Herbs

Principles of Food and Health

- Solely taking vitamin supplements is not the way to good health. -Use foods rather than supplements to treat and prevent chronic diseases.
- Good nutrition creates good health in all areas of existence.
- Nutrition can substantially control the adverse effects of noxious chemicals.
- Nutrients in right quantities are important for health

2.3.1 Medicinal Value of Herbs

A herb is a plant or plant part used for its scent, flavor or therapeutic properties. Herbal medicines are one type of dietary supplement.

Following Table 2.3 gives therapeutic uses of herbs.

Table 2.3 Medicinal Value of Herbs

Herbs / Therapeutic Uses	
Improves blood circulation, menstrual problems. Relieves kidney pain and used in treating diabetes.	Acts as a tonic for stomach and heart. Used for treating urinary tract infection.
	
▲ Plate 2.7 Curry Leaves	▲ Plate 2.8 Coriander Leaves

Table 2.3 Medicinal Value of Herbs

Herbs / Therapeutic Uses	
Contains antioxidant and anti-inflammatory agent called rosmarinic acid to treat allergies. It is natural anti-microbial agent and breath freshener  ▲ Plate 2.9 Mint	Helps to alleviate cold, cough and reduce sore throat It treats asthma and bronchitis It aids in digestion  ▲ Plate 2.12 Karpooravalli
Well known immunity booster Helps to tolerate stress Relieves mouth ulcers and treat bronchitis Treats skin disorders Promotes hunger  ▲ Plate 2.10 Tulsi	It acts as a laxative Controls cough and flatulence It helps to cure ulcers in Stomach It helps in regulating diabetes.  ▲ Plate 2.13 Fenugreek
It is used to treat joint pain, arthritis It treats itchy scalp and dandruff It treats eczema Prevents menstrual cramps  ▲ Plate 2.11 MudakathanKeerai	It is used to treat digestive tract spasms, stomach ache. Helps to control high blood pressure. Helps to treat rheumatism.  ▲ Plate 2.14: Lemon Grass

Source: Reader's Digest 'Foods that harm foods that heal' edited by Alasdair McWhirter, Liz clasen(2001)

2.4 Preliminary Preparation

Preliminary preparation of food is very essential to prepare healthy delicious dishes. The efficiency of a cook depends on how he/she organizes work in the kitchen. If pre-preparation is thoroughly and systematically done then the service will be carried out smoothly.

A good chef takes pride in the thoroughness and quality of the pre-preparation or mise-en-place (pronounced meez-on-plahss). This French term meaning "everything put in place," has become almost a professional password in kitchen, because it is important for the success of the establishment.

Pre-preparation saves time and energy. The following steps should be followed before the actual cooking.

- Assemble tools required.
- Collect ingredients needed for cooking
- Wash, trim, cut, prepare, and measure raw materials.
- Check equipment before cooking.

a. Cleaning/Washing: All raw ingredients should be washed and cleaned before cooking to ensure microbiological safety of food. All vegetables should be washed thoroughly before peeling or cutting.

Dry ingredients like cereals and pulses should be cleaned to remove dirt, stones and foreign matter before cooking.

b. Peeling: Most of the vegetables and fruits are peeled before the preparation of recipe. The outer skin will be peeled using a peeler or knife. Care should be taken to peel the skin very thin because most of the nutrients are under the skin of the fruits and vegetables. Certain vegetables like potatoes can also be peeled after boiling. Tomato skin can be peeled after blanching.

c. Grinding: Grinding reduces the food to a fine form. Dry grinding helps to get masala powders and wet grinding helps to get chutneys and batters for idli, dosai and adai.

d. Grating: Shredding of certain foodstuffs is called grating. Vegetables and fruits can be grated to make salads interesting. Cheese can be shredded to decorate the foods prepared.

e. Soaking: Foodstuffs are generally soaked to make them soft as it helps to make cooking faster and grinding easier. Cereals and pulses are soaked for grinding and cooking. It enhances

DO YOU KNOW?

How Food Works as Medicine

1. Balances hormones
2. Controls inflammation
3. Neutralizes acid base balance
4. Detoxifies and eliminates toxins
5. Improves absorption
6. Balances blood Sugar

nutritional value and helps in removing the toxic substances. It also saves time and fuel.

f. Germination: Germination is the process of a seed to cause sprout or form new tissue following metabolism. In order to sprout seeds like ragi, green gram, cow pea and bengal gram soak in water for 8 hours and drain water and cover it in a muslin cloth and keep it in the room temperature for another 8 hours. Sprouting of seeds can be seen. This process enhances the nutritive value by increase in vitamin , folic acid and malting of sugar take place.

Covering with muslin cloth for germination

Germinated Green Gram

g. Blanching: Vegetables and fruits are immersed in boiling water for a few minutes and then in cold water. This is called blanching. Blanching is used in food preservation as it inactivates the enzymes that cause food spoilage. This method is also used to loosen the skin of fruits to peel them easily and used for purees and canned foods.

Blanching

h. Marinating: Food is soaked in a marinade to add flavour and tenderize it. A marinade is a combination of oil, flavouring agents and acid. **Eg:** Meat, fish, and vegetables

i. Cutting:

Cutting

▲ Figure 2.4 Safe Knife Cutting

2.4.1 Basic Cuts and Shapes

Cutting food products into uniform shapes and sizes is important for two reasons:

1. It ensures even cooking.
2. It enhances the appearance of the product

Common Vegetable Cuts:

- Brunoise (broon-wahz); Fine dices (3mm × 3mm × 3mm)
  Fine dices are used to make soups, usili and fried rice.

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▲ Plate 2.15 Brunoise

- Dicing
  Small dice: (6mm × 6mm × 6mm)
  Medium dice: (12mm × 12mm × 12mm)
  Large dice: (2cm × 2cm × 2cm)

Medium dice are mostly used in the fried items using yam, raw plantain.

Large dice of vegetables are used in the preparation of mourkuzhambu, sambar.

▲ Plate 2.16 Dicing

Julienne (or allumette): (3mm × 3mm × 6cm)

Julienne cuts are used in the preparation of salads and noodles

▲ Plate 2.17 Julienne

- Batonnet: Means little sticks (6mm × 6mm × 6–7.5cm)
  Batonnet cuts are used for making fish fingers.

- French fries or pommefrite: 8–12mm sq × 7.5cm long.

The following terms describe other cutting techniques:

- Chop: to cut into irregular shaped pieces.

▲ Plate 2.18 Batonnet

▲ Plate 2.19 Pomme Frite

▲ Plate 2.20 Coarsely Cut Tomatoes

Eg: coriander leaves chopped to garnish dishes.

- Concasser (con-cass-say): to cut coarsely.
  Eg: tomato cuts for thokku.
  Mince: to chop into very fine pieces.
  Eg: meat for cutlets.

▲ Plate 2.21 Chopped Coriander

▲ Plate 2.22 Minced Onion

- Shred: to cut into thin strips, either with the coarse blade of a grater or with a knife.
  Eg: Cheese is shred to top sandwiches and pizzas.

A complete preliminary procedure is part of the mise-en-place or pre-preparation.

2.5 Preparation of Suitable Food for a Customer in Food Service

A good restaurant sets a high standard for its food quality and ensures that guests

receive the same quality with every meal. The success of a food service is determined by quality assurance by providing wholesome quality food to the customer in a pleasant manner. High-quality ingredients and experienced personnel are important to serving good food consistently. The way of presentation can lift the dish out of the realm of the ordinary and make it a special creation. These can be achieved by color and appearance, texture and variety, food presentation and service and ambience.

a. Colour and Appearance: The appearance of the food helps to attract the attention of the customers as the looks help in tasting the food. The appearance can be colour, texture and also presentation. Food can be made appealing and appetizing by the way foods appear on the plate. The colour combination with vegetables, natural food colour and combination of spices makes the dish beautiful and more attractive to the customer. Appearance of food only decides the customer's choice of food to be consumed. It describes the origin of food and creativity of the presenter looks and appetizing. Rice served in white color with curd raitha may look monotonous instead of pulao served with tomato sauce or plain rice with sambar may be eye appealing. Little coriander on soups or any dish or a salad with different vegetables or a fruit salad with all kinds of fruits helps to increase the stimulation.

b. Texture and Variety: Texture is the sense of food. Choose textures that complement each others. Contrasting texture adds much to the value of food and can lift the dish. If texture in all soft or all firm does not appeal to the customer, it is interesting to have variety of textures on the plate but how these textures are combined is very important.

Another important rule is balancing variety and contrast. Variety can be achieved by various textures and colour. Vegetables combined with different cuts to make vegetable noodles – (Julienne 1/4 inch strips) or vegetable rice (Dice 1/2 × 1/2 inch).

c. Food Presentation and Service: Food presentation is as important as taste and flavor of food. The way food is presented to the customers will make a restaurant successful and unsuccessful. No matter how delicious a dish may be, it really matters how it is presented. Service depends on customer expectation. Convenient, timely service, good presentation, serving food at correct temperature and cordial personnel will attract customers. **Eg:** For a kids party it can be fun design instead traditional presentation. Vegetable and fruit carvings, designs and toppings will help to increase the attractiveness of the food, depending on the type of food.

Successful handling of food by maintaining its right temperature with right accompaniments (combination) helps to present the food to full advantage. Preparation of service in terms of laying the cover, placing the right crockery, cutlery according to the dishes that will be served leads to success of any food service. In Indian cuisine banana leaf, katories and Thali are used to serve in a traditional way. While for international cuisines appropriate crockery and cutlery for each course should be placed.

d. Ambience: Atmosphere is determined by the décor, uniforms of staff, dress codes of staff, type of service and cutlery and crockery.

The customer's first impression of the restaurant will be the final impression. It can be done by a good table setting that complement the menu and the decor. Desirable ambience can be achieved by maintaining hygienic standards, impeccable hospitality skills, good music, right colour combination and furniture to suit the theme of the restaurant. Comfort with furniture impacts ambience. Creating more space for customers will make them feel at ease. The lighting enhances the visibility of the food and hence helps in increasing the appearance in turn helps to gain attention. Perfect lighting and creating good mood to eat will make up ambience.

This phenomenon of making food tailored for each customer will have many advantages to the food service institution. It helps to increase the customer turnover and customer satisfaction. It also increases the confidence of the food service institution among the customers.

Key Words

Brunoise : Fine dices
Dicing : Small dice
Julienne : Cuts are used in the preparation of salads and noodles
Concasser : Cut coarsely
Chop : Cut into irregular shaped pieces
Mince : Chop into very fine pieces
Shred : Cut into thin strips

Linkages

https://www.youtube.com/watch?v=Gmh_xMMJ2Pw -How to Create a Healthy Plate
https://www.youtube.com/watch?v=sssM7c-HiRg- 4 Food groups
https://www.youtube.com/watch?v=G-Fg7l7G1zw- Basic Knife Skills

Student Activity

- Identify and name the various millets, pulses and spices in English and Tamil.
- Planning a weekly menu for a school hostel using four food groups
- Cook any one nutritious recipe.
- Bring Medicinal herbs to start a herb garden in school. Plant them and take care of them.
- Training on different cuts of vegetable and prepare a dish with the same.

Teacher Activity

- Prepare a tray with foodstuffs from the lab to show how food is classified.
- Plan a sample menu using the Food Pyramid and the Four Food groups.
- Facilitate for the development of Kitchen and herbal garden Encourage students to grow herbs in the garden and use them for their practical.
- Demonstration of different types of cutting.

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Questions

I. Choose the correct answer

1. Nutritive value of Indian foods is given by ……..
   a. WHO
   b. ICMR
   c. USDA
   d. FAO

2. Soya bean is a rich source of ……..
   a. Fat
   b. Protein
   c. Carbohydrate
   d. Fibre

3. Garnish with coriander improves---------- of the food
   a. Appearance
   b. Texture
   c. Variety
   d. Ambience

4. Julianne cuts of vegetable is followed in the preparation of ----------
   a. Accompaniment
   b. Vegetable pulao
   c. Sauce
   d. Dessert

5. Recommendation for the number of daily servings to be consumed from each of the food group is given by ……
   a. Four food groups
   b. Food Pyramid
   c. Functional Food
   d. Therapeutic food

6. Green leafy vegetables and fruits are rich source of ……..
   a. Carbohydrates
   b. Proteins
   c. Vitamins and Minerals
   d. Fats

7. A herb used as a breath freshener
   a. MudakathanKeerai
   b. Coriander
   c. Mint
   d. Tulsi

8. Décor, Color, Light , and furniture creates ----------
   a. Beauty
   b. Ambience
   c. Appearance
   d. Attraction

9. Water required for drink daily is ……
   a. 1 litre
   b. 1.25 litres
   c. 2 litres
   d. 2.5 litres

10. The number of servings for fats in food pyramid is-------
    a. High
    b. Medium
    c. Sparing
    d. Very much limited

II. Write in three lines (3 Marks)

1. Food is known as 'an important basic need of man'. Why?
2. Pulses are not high biological value of protein food. Give reason.
3. What are the Social functions of food?
4. What is 'mise-en-place'?
5. State two reasons for cutting fruits and vegetables into uniform shape and size.
6. How will you bring good ambience in a Restaurant?
7. Presentation and service- What are the steps you will take to attract the customer?
8. Identify the medicinal value of any two herbs.
9. Suggest food herbs for a person suffering from digestive problems.
10. State the uses of dicing and Julienne cuts.

III. Write in a paragraph (5 Marks)

1. Draw the food pyramid and state its need for planning menu.
2. Tabulate Portion size of foods for an adolescent girl. Evaluate the adequacy of proteins in Indian diet. Give suggestions to improve the same.
3. State the principles of food and health – Justify.
4. What are the preliminary pre-preparation methods used for making sundal? Give reasons.
5. Indicate the safe handling of knives.

IV. Answer in detail (10 Marks)

1. Classify food and Explain.
2. Write in detail about the different types of cutting.
3. How will you make a food appealing for a customer in a food service?
4. Plan a day's menu for an adolescent girl and state reasons for the inclusion of foods.

Chapter 3 Selection of Foods and Methods of Cooking

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Learning Objectives

- Identify the resources needed for food selection, purchase and storage.
- Know the techniques of food purchase and food standards.
- Know the appropriate methods of food storage.
- Learn different methods of cooking.
- Understand the impact of fast food on health.

The food industry varies from the simplest to the multifaceted that may involve public dining rooms, employee dining rooms, cafeterias, banquet service and room service. Such institutions serve various functions depending on the demands by the customers and vary from small to very large establishments.

Individuals working in food service management need a variety of skills that can be acquired through training in proper selection, purchasing, storage of foods, hospitality, marketing, sales and accounting.

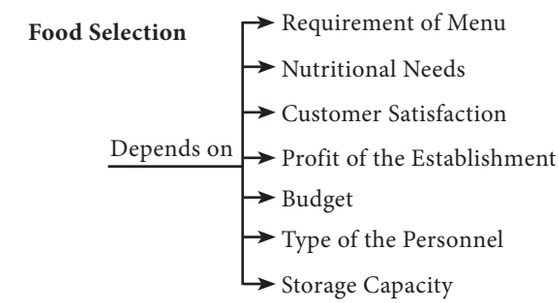
3.1 Selection, Purchase and Storage of Foods

3.1.1 Food Selection

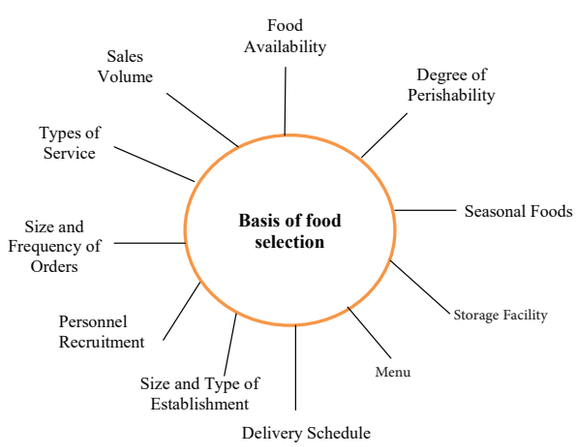
"Food selection is a choice of selecting a food which is good for the customer".

Selection of food is very important in running a food service. Providing food in a manner which is satisfactory to customer is a challenging task.

Careful thought, planning and appropriate decision is very important in selection of food. Quality food can be selected when standards like FSSAI are followed.



▲ Figure 3.1 Significance of Food Selection



▲ Figure 3.2 Basis of Food Selection

Table 3.1 Food Quality Indicators			
S.No	**Fresh foods**	**Indicators of wholesomeness**	**Food standard**
1	Cereals, pulses and legumes	Free from insect infestations and stone Even shape, colour and size of grains	FSSAI
2	Fruits and vegetables	Good natural colour, firm, evenly shaped, mature, free from dirt, blemishes	FSSAI
3	Poultry	Good overall shape and smell	FSSAI
4	Meat	Firm flesh, fine grain, age of the animal seen from skeleton colour of the muscle	FSSAI
5	Milk and milk products	Good colour, opaque, no sour, odour or taste, uncurdled	FSSAI
6	Fish	Free from bruises and bad smell	FSSAI
7	Egg	Smooth, velvetty surface, translucent, no cracks	FSSAI
8	Fats	No rancidity, viscous, properly stored in containers	FSSAI

DO YOU KNOW?

Choose fruits ripened in the sun

Tomatoes ripened outdoor on the vine can have twice as much vitamin C as green house tomatoes.

FSSAI

Food Safety and Standards Authority of India (FSSAI) is an autonomous body established under the **Ministry of Health and Family Welfare,** Government of India. It has been established under the **Food Safety and Standards Act, 2006**.

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Food Safety and Standards Authority of India

▲ Plate 3.1 FSSAI

The main objectives of FSSAI are to

- Ensure establishment of standards and practices that fully assure consumers interest and adhere to the highest degree of integrity possible.
- Create awareness among consumers in making informed choices regarding the food they consume.
- Establish a framework of food safety with defined responsibility of each food business operator.

3.1.2 Purchasing

"Purchasing is the formal process of buying goods and services".

Table 3.2 Food Purchase Chart				
S.No.	Types of food	Shelf life	Examples of food item	Frequency
1	Perishable	Short Life Liable to spoil or decay	Meat, fish, poultry, dairy products	Daily basis
2	Semi perishable	Limited shelf life	Potatoes, Onions, Garlic	Weekly basis
3	Non-perishable	Longer shelf life	Cereals, Flours, Spices, Canned foods, Nuts	Monthly basis

"Purchasing is the process of getting the right product into facility at the right time and place, plus the amount of goods at the right price and source".

Every production operation has different purchasing procedures. But there is one rule that should always be followed.

Buy only as much as it is needed until the next delivery.

This will ensure that foods stay fresh and will create a high inventory turnover.

a. Important Functions of Food Purchasing in a Food Service

- Help in menu planning.
- Aid to predict profitability of an establishment.
- Evaluate the quality of the products.
- Identify the suppliers potential.
- Maintain customer satisfaction.
- Know the latest forms of technology, products or services available in the market place.

b. Methods of Purchasing

Depending on the type of establishment, the following purchasing methods are used.

▲ Figure 3.3 Methods of Purchasing

i. Direct Delivery

- Involves direct delivery of food and beverages from the manufacturers to the food service operation.

ii. Formal Buying

- Quotations are invited from the sellers, bids are made and the best one is selected.
- Generally adopted by large catering establishments.

iii. Wholesale Buying

- Contract is signed with a wholesaler for purchase of goods at a specific price for a future period.
- Suitable for large scale food service operation.

▲ Plate 3.2 Wholesale Buying

iv. Blanket Order Purchasing

- An agreement to provide a specified quantity of listed items for a period of time at an agreed price.

v. Stockless Purchasing

- The buyer does not keep the stocks of goods but the supplier keeps it.
- Then the buyers get the goods according to the needs.

vi. Auction Buying

- Manufacturers announce the sale of goods.
- Suitable for large food service operation.

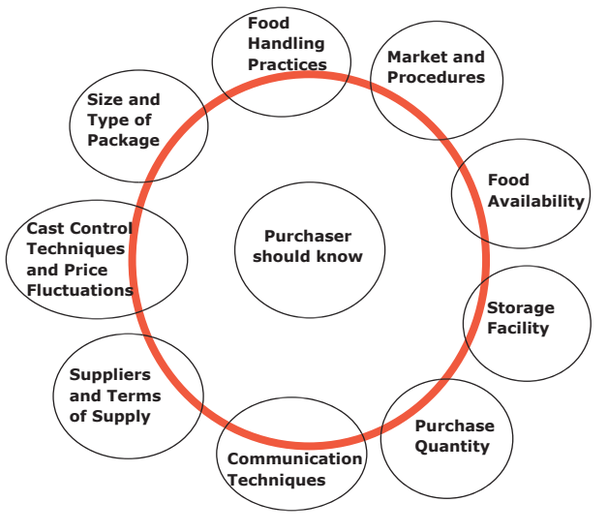
vii. Online Purchasing

- Ordering food from a local or food cooperative through a web page or app.

Guidelines for Purchasing Foods

- Check 'expiry' and 'best before' dates and purchase food accordingly.
- Buy only pasteurized milk and government inspected meat and poultry.
- Do not buy canned goods in tins that are bulged, dented, rusted or cracked.

c. Knowledge Required for a Food Purchaser



▲ Figure 3.4 Knowledge Required for a Food Purchaser

- Do not buy food from unrefrigerated displays that should be in a cooler.
- Do not purchase eggs that are cracked.
- Buy seasonal foods.
- Bulk buying is preferable.

3.1.3 Storage of Foods

"It is the process in which both cooked and raw materials are stored in appropriate conditions for future use without any spoilage".

Golden rules for storing food.

- **Clean**
- **Cover**
- **Cool/Dry**

DO YOU KNOW?

Why potato is not stored in cold temperature?

Keeping a potato in the cold temperature will turn its starch into sugar more quickly.

Importance of food storage in a food service

- Preserve wholesomeness of the food.
- Protect quality of the food ingredients.
- Maintain expected shelf life of the product.
- Reduce wastage and spoilage.
- Control temperature.
- Prevent food contamination.
- Ensure safe for consumption.
- Stabilize the price.
- Future use.
- Cope with demand, production on a continuous basis.

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

Table 3.3 Types of Food Storage

S.No.	Type of storage	Foods to be stored	Temperature	Characteristics of storage place
1	Dry storage	Cereals, canned foods, flour, sugar, shortenings, spices, certain fruits and vegetables like bananas, onions and potatoes.	21°C	• Should be clean • Adequate ventilation with sufficient air circulation • Low humidity
2	Refrigerator storage	Fresh, cooked or partially cooked foods (milk, meat, vegetables)	0–7°C	• Regular cleaning of condenser coil should be done • Do not open the door frequently
3	Frozen storage	Meat, Ice cream, Butter, Cheese, Milk	–18°C	• Accumulation of ice should be cleared frequently • Proper air circulation is preferable.

Table 3.4 Ideal Ways of Storage

S.No.	Food ingredients	Storage
1	Cereals, pulses	Rigid sealed container or metal can
2	Fruits and other vegetables	Simple evaporative air cooled cabinets
3	Roots and tubers	Dry place for storage
4	Milk and milk products	Mechanical refrigerator
5	Egg	Egg cartons
6	Fish	Wooden or concrete acid resistant tanks
7	Meat	Hanging in carefully controlled environments
8	Fats and oils	Air tight container
9	Spices	Glass or plastic container
10	Canned foods	Cool and dry place
11	Frozen foods	Store at appropriate temperature after purchase.

3.2 Methods of Cooking

"Cooking is the art of preparing food for consumption commonly with the application of heat"

Cooking techniques and ingredients vary widely across the world, reflecting unique environmental, economical, cultural and traditional trends. Art of skill and training are needed for effective cooking.

3.2.1 Objectives of Cooking

- Cooking kills micro-organisms
- Sterilizes food
- Helps to keep food longer
- Softens the food
- Aids digestion
- Improves palatability and quality of food
- Introduces variety and
- Increases the availability of nutrients.

3.2.2 Cooking Methods

Heat is transferred to the food during cooking by conduction, convection and radiation. The manner in which heat is applied to the food during cooking determines the type of cooking method used. The methods developed may be classified under three main heads:

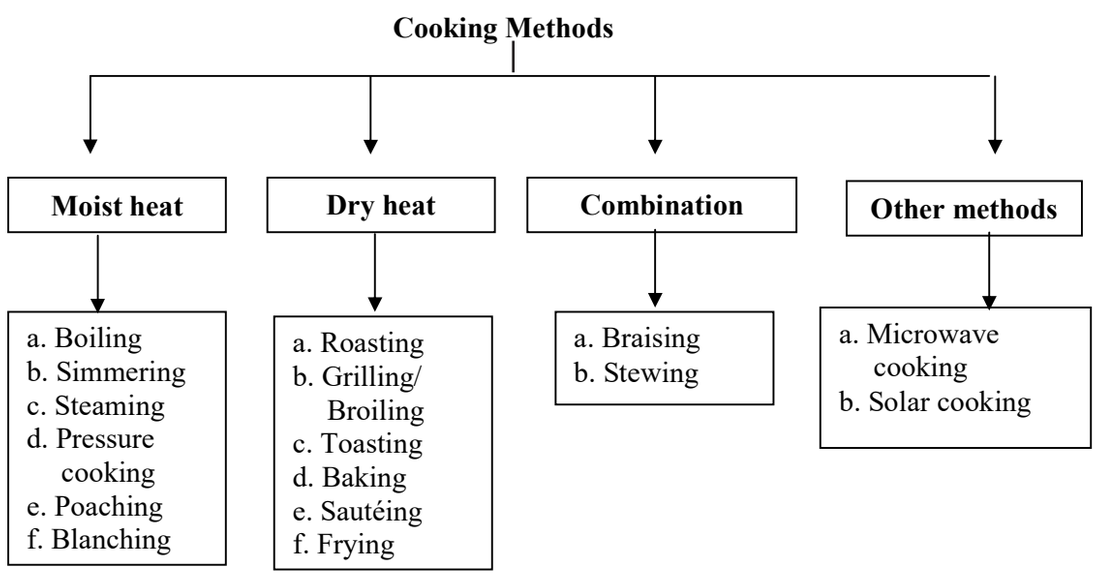
- **Moist heat:** Involves water and steam
- **Dry heat:** Involves air or fat
- **Combination Methods:** Combination of both moist heat and dry heat methods

3.2.3 Classification of Cooking Methods

I. Moist Heat Methods

a. Boiling: It is a method of cooking food by just immersing in water at 100°C and maintaining the water at that temperature till the food becomes tender. **Eg:** Rice, egg, dhal, meat, roots and tubers can be cooked by boiling.

b. Simmering: Food is cooked in liquid at a temperature just below the boiling point.



▲ Figure 3.5 Cooking Methods

▲ Plate 3.3 Boiling

▲ Plate 3.4 Simmering

c. Steaming: It is a method of cooking food in steam, generated from vigorously boiling water in a pan. **Eg:** Idli, Idiappam(string hopper) and vegetables are prepared by steaming.

▲ Plate 3.5 Steaming

d. Pressure Cooking: When steam under pressure is used, the method is known as pressure cooking and the equipment used is pressure cooker. In this method the temperature of boiling water can be raised above 100°C. **Eg:** Rice, dhal, meat, roots and tubers can be pressure cooked.

▲ Plate 3.6 Pressure Cooking

e. Poaching: This involves cooking in minimum amount of liquid at temperatures of 80°C–85°C that is below the boiling point. **Eg:** Egg and fish can be poached.

▲ Plate 3.7 Poaching

f. Blanching: In this method, food is immersed in boiling water for five seconds to two minutes depending on the texture of the food and put it in cold water. This helps to remove the skin or peel without softening the food.
Eg: Tomatoes can be blanched.

▲ Plate 3.8 Blanching

II. Dry Heat Methods

a. Roasting: In this method, food is roasted in a heated tawa or frying pan without covering it. But roasting can be done with or without any medium of cooking.
Eg: Groundnut can be roasted with or without oil.

▲ Plate 3.9 Roasting

b. Grilling/Broiling: Grilling or broiling refers to the cooking of food by exposing it to direct heat. In this method food is placed below or above or in between a red-hot surface.
Eg: Papads, corn, phulkas, chicken and fish.

▲ Plate 3.10 Grilling / Broiling

c. Toasting: In this method the food is kept between two heated elements to facilitate browning on both sides.
Eg: Bread slices can be toasted.

▲ Plate 3.11 Toasting

d. Baking: Baking is the method by which food is cooked by hot air. Country ovens and modern ovens are used for baking.
Eg: Bread, cake, biscuits and meat can be baked.

▲ Plate 3.12 Baking

e. Sautéing: It is a method of cooking or browning of food in a pan using a small quantity of butter, oil or ghee. **Eg:** Vegetables.

▲ Plate 3.13 Sautéing

f. Frying: It is the process of cooking food in hot ghee or oil. Food can be cooked either by shallow frying or by deep frying

▲ Plate 3.14 Frying

- Shallow frying means frying in little oil. **Eg:** Omelette, cutlets.
- Deep frying means immersing food fully in hot ghee or oil.
  Eg: Samosa, chips, Poori.

III. Combination of Cooking Method

a. Braising: It is a combined cooking method of frying lightly and stewing it slowly in a closed container.
Eg: Uppuma – Roasting and boiling, Cutlet – Boiling and shallow fat frying.

b. Stewing: It is a combination of sautéing and simmering. **Eg:** Meat stew.

IV. Other methods

a. Microwave Cooking: A magnetron tube is a source from where the electro-magnetic radiation with high frequency wave cooks the food.

Food should be kept in containers made of plastic, glass or chinaware and

▲ Plate 3.15 Microwave Cooking

non-metallic containers. These containers are used because they transmit the microwaves but do not absorb or reflect them.

Eg: Cake can be baked in microwave oven.

DO YOU KNOW?

Do not try recipes that require a lot of water such as pasta in microwave because they do not cook well.

b. Solar Cooking: Solar cooking is a very simple technique that makes use of sunlight or solar energy.

Solar cooker consists of a well-insulated box which is painted black inside and covered with one or more transparent covers. These covers allow the radiation from the sun to come inside the box but do not allow the heat from the hot black absorbing plate to come out of the box.

Because of this, temperature up to 140°C can be obtained which is adequate for cooking. Solar cooking is free of scorching and oozing of contents.

Eg: Rice

▲ Plate 3.16 Solar Cooker

3.3 Effects of Cooking on Nutrients

Eating nutritious food can improve health and energy levels. The way of cooking food has a major effect on the nutrient contents. Exposure to heat, light or oxygen will alter the nutrients in food.

The following nutrients are often reduced during cooking.

- **Water Soluble Vitamin:** Vitamin C and vitamins B – thiamine, riboflavin, niacin, pantothenic acid, pyridoxine, folic acid and cyanocobalamin.

3.3.1 Guidelines for Nutrients Conservation

Conservation of nutrients means saving nutrients during the process of preparation and cooking of food.

To conserve nutrients in food items the following techniques can be practiced:

1. Wash vegetables before cutting
2. Cut vegetables into large pieces just before cooking
3. Scrape the peels of vegetable as thin as possible because vitamins and minerals are found just under the skin of the vegetables.
4. Soak dry pulses with enough water prior to cooking.
5. Use just enough water for cooking.
6. Cooking in a pan which has a well-fitting lid avoids nutritional loss.
7. Do not overcook the food.

Table 3.5 Nutritional Changes during Cooking		
S.No.	**Methods of Cooking**	**Nutritional changes**
1	Boiling	• Destroys vitamin C since it is water soluble and sensitive to heat. • Boiling fish helps to preserve omega-3 fatty acid.
2	Simmering	• Thiamine, niacin and other B vitamins may be lost when meat is simmered and its juices run off.
3	Steaming	• One of the best cooking methods for preserving nutrients, including water soluble vitamins, that are sensitive to heat and water.
4	Poaching	• Poaching allows the proteins in food to denature slowly, without squeezing out moisture.
5	Grilling and Broiling	• B vitamins may be lost.
6	Roasting and baking	• Most vitamin losses are minimal except B vitamins
7	Sautéing	• Cooking for a short time without water prevents loss of B vitamins.
8	Frying	• Preserves vitamin B and vitamin C. • Increases the amount of fibre in potatoes. • Degrades omega – 3 fatty acid content
9	Microwave cooking	• Preserves most nutrients. • Short cooking time.

8. Do not use baking soda while cooking.
9. Choose a suitable cooking method for each food items to preserve nutrients

3.3.2 Tips for Making Healthy Choice of Food

* **Make Careful Menu Selection:** Order items with more vegetables and choose lean meats

* **Drink Water with Your Meal:** Try adding a little lemon to water or ordering unsweetened iced tea instead of soda

* **Special Order:** Order for vegetables and main dishes to be served without the sauces

* **Eat Mindfully:** Chew food more thoroughly and avoid eating on the run

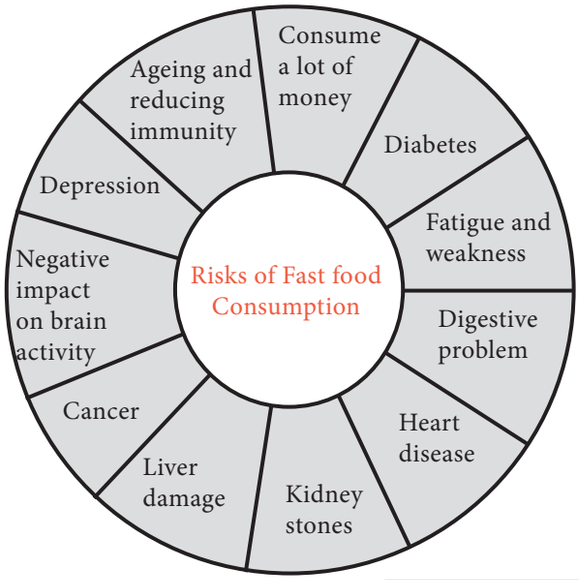
3.4 Fast food and Health Hazard

Fast foods are typically ready to eat foods containing high levels of saturated fats, salt or sugar and little or no fruit, vegetables or dietary fiber and are considered to have little or no health benefits.

Commonly Consumed Fast Foods are:

- Chips
- Candy Gum
- Pizzas
- Burgers
- Fried Foods
- Bhelpuri
- Chilly Mushroom
- Chilly Chicken

▲ Plate 3.17 Fast Food



▲ Figure 3.6 Risks of Fast Food Consumption

R5L9FQ

Why fast foods are unhealthy

- Artificial colours and preservatives are used.
- Mostly prepared in an unhygienic environment.
- Addition of too much of any ingredient cause ill effect to health.
- Raw ingredients may be adulterated.
- Reusing oils many times.
- Poor personal hygiene of food handler.

Key Words

Perishable : Spoil / Decay
Blemishes : Discolourations
Bruises : An Injury
Viscous : Thick and Sticky
Translucent : Allowing Light
Rancidity : Unpleasant Smell
Fluctuations : To change Continually
Contamination : Made Impure
Palatability : Pleasant Taste
Denature : To change the Nature

Linkages

https://www.youtube.com/watch?v=ZN6--Xi5lKo-Receiving & Put away

https://www.youtube.com/watch?v=_QuU6rs-n5Q&t=1s-Cooking Methods

Student Activity

Plan a visit to a retail grocery shop / wholesale grocery shop and departmental store and report on

- Selection
- Purchasing
- Storage of foods

Teacher Activity

- Prepare a questionnaire to conduct a survey to find out foods with ISO, FSSAI and BIS.

Questions

I. Choose the correct answers

1. ……. is the formal process of buying goods and services.
   a. Selection
   b. Storage
   c. Purchasing
   d. Processing

2. Firm flesh is the quality indicator of……
   a. Meat
   b. Fruits
   c. Cereals
   d. Egg

3. Foods that are liable to spoil are called as ……
   a. Staple
   b. Semi perishable
   c. Non-perishable
   d. Perishable

4. Potatoes can be purchased by …….. basis
   a. Weekly
   b. Monthly
   c. Daily
   d. Once in two weeks

5. Ordering food through a web page is called as …….. purchasing.
   a. Auction
   b. Online
   c. Formal
   d. Direct

6. Cereals can be stored by ……..
   a. Dry
   b. Cold
   c. Frozen
   d. Refrigeration

7. Ideal temperature for frozen storage is ……..
   a. 21°C
   b. 7°C
   c. –18°C
   d. –5°C

R5PW4M

8. Concrete acid resistant tanks are used for …….. storage.
   a. Pulses
   b. Milk
   c. Fish
   d. Spices

9. …….. is the method by which food is cooked by hot air
   a. Blanching
   b. Poaching
   c. Baking
   d. Boiling

10. …….. is the example of combination of both moist and dry heat cooking methods.
   a. Boiling
   b. Braising
   c. Pressure cooking
   d. Baking

11. Steaming can be used for preparing ……..
   a. Dosa
   b. Idli
   c. Poori
   d. Vada

12. Solar cooker consists of well insulated box which is painted with ……. colour.
   a. White
   b. Black
   c. Red
   d. Blue

13. Boiling fish helps to preserve …… fatty acid.
   a. Omega 3
   b. Omega 6
   c. Trans
   d. Saturated

14. Cooking for a short time without water prevents loss of …….. vitamins
   a. A
   b. B
   c. E
   d. K

15. The ingredient present in fast food leads to high blood pressure
   a. Fenugreek
   b. Artificial colours
   c. Turmeric
   d. Salt

II. Write in three lines (3 marks)

1. What is food selection? Give any two reasons for selecting foods.
2. Expand FSSAI and write their objectives.
3. Tabulate the chart of food purchase.
4. List the purchasing methods.
5. Write any 3 guidelines for purchasing food in a food service
6. What are the golden rules for storing any kind of foods?
7. Tabulate the types of food storage.
8. Classify the methods of cooking.
9. Enumerate the objectives of cooking.
10. Write short note on microwave cooking.
11. What are the nutrients reduce while cooking?
12. Give few examples of fast food.
13. Write the tips for making healthy choice of food.

III. Write in a paragraph (5 marks)

1. Write the basis of food selection in a food service.
2. Tabulate food quality indicators.
3. List the importance of food purchasing in a food service?
4. What are the factors considered while purchasing?
5. Indicate the important functions of food storage.
6. Write short note on solar cooking.
7. Write the guidelines for conserving nutrients.
8. Why fast foods are unhealthy?

IV. Answer in detail (10 Marks)

1. Explain the methods of purchasing and suggest a suitable methods of purchasing perishables foods for a cafeteria.
2. Write on the nutritional changes during cooking.
3. Explain moist heat method with examples.
4. Highlight on dry heat method quoting examples.
5. Tabulate the ideal methods of food storage.
6. What is fast food? Give diagrammatic representation of risks of its consumption.

Chapter 4 Food Service Equipment

R5V5HD

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 equipmet.

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

▲ Plate 4.3 Small 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 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 Rack

▲ 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.

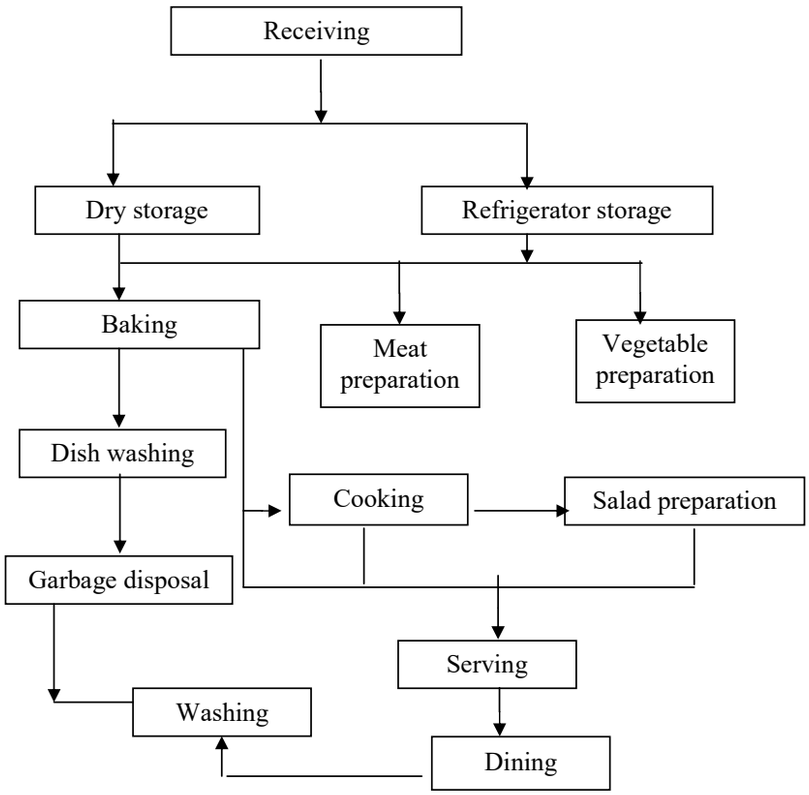
The work areas are essential to perform various activities in food service operation. The flow chart (Figure 4.1) shows the work areas in food service outlets.

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

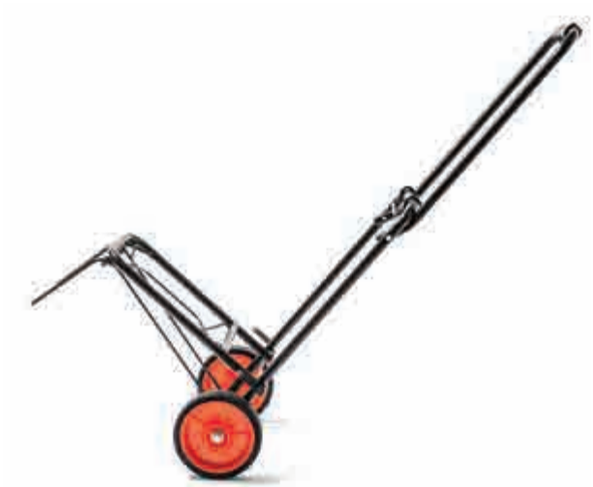
3. Lactometer

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 length of time and at different temperature 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 subject 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 10^0 to 21^0C. 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 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^oC and 4^0C. It can be in the form of a complete room (walk in cooler) or a cabinet which is free standing or fixed in 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 item 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.

R5YS6A

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 up 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 spout and handle which helps 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 multi-purpose 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 use 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

▲ Plate 4.30 Steamer

▲ Plate 4.31 Steamer

registers steam pressure, also an 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 is (also called a stove top) 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 and 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

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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 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 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/china bowl to dress/serve salad	Salad section
8	Ice cream scoop	To scoop out and service ice cream	Pantry/still room
9	Bread basket	Cane basket for holding bread rolls/ bread	Hot plate/pickup 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 on 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.

R68N7X

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

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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
    b. Grinder
    c. Mincer
    d. Grater

14. Equipment used to transport food to the guest table is .....
    a. Platter
    b. Dish
    c. Trolley
    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.

Chapter 5 Bakery

R6HJ9K

Learning Objectives

- Gain knowledge on the types of baked products, ingredients needed for baking and method of baking.
- Obtain the skill of baking and setting up his/her own bakery unit.
- Understand the techniques used to prepare products that are easy to bake and sell.

A bakery is an establishment that produces flour- based food like bread, cookies, cakes and pies. The first evidence of baking occurred when humans took wild grass soaked in water and mashed it into a paste. The mashed paste was poured on flat, hot rocks to produce a bread like substance. Later when fire was invented the paste was roasted on hot embers, which made baking easier. Baking began in Greece around 600 B.C. The art of baking was developed early during the Roman empire. Due to the fame and desire the art of baking received importance around 300 B.C. So, baking was introduced as an occupation and respectable profession for the Romans.

Baking needs an enclosed space for heating called **an oven**. The oldest oven was discovered in Croatia dating back 6,500 years ago. Asian cultures have adopted steam baskets to produce the effect of baking. The heat can be supplied by wood, coal, gas or electricity. An oven mitt (an insulated glove) or a peel (a long-handled tool) is used to add or remove items from the oven. Baked goods are served during religious festivals and are also a fundamental part of everyday food consumption in many cultures.

5.1 Types of Bakery Products

Classification: Bakery products (Table 5.1) can be classified into four categories according to the way in which the products are leavened.

DO YOU KNOW?

Margarine -
It is a hydrogenated, hardened fat from vegetable oils, which involves chemical reaction converting the unsaturated fatty acids into saturated fatty acids

Table 5.1 Types of Bakery Products			
No	**Method of Leavening**	**Examples of Bakery Products**	**Leavening Agent**
I	Yeast raised	Breads and sweet doughs	Leavened by carbon-di-oxide
II	Chemically leavened	Layer cakes, Doughnuts and Biscuits	Leavened by carbon-di-oxide from baking powders and chemical agents
III	Air-leavened	Angel cakes and Sponge cakes	Incorporating air into egg, sugar and flour mixture without baking powder
IV	Partially leavened	Pie crusts and certain crackers	No leavening agents are used

Types:

1. Bread 2. Cakes 3. Bun 4. Pastries
5. Biscuits 6. Cookies 7. Doughnuts 8. Crackers

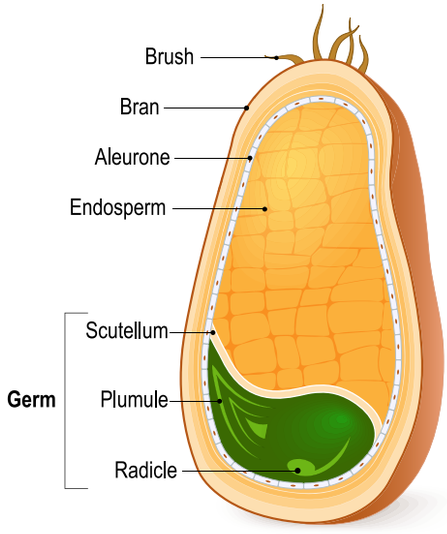
5.2 Baking Ingredients

1. Wheat flour / Maida
2. Leavening agents
3. Yeast
4. Baking powder
5. Eggs
6. Shortenings
7. Sugar

1. Wheat Flour / Maida

- Wheat is used principally for baking.
- Wheat contains 6–18 per cent protein.
- Wheat flour contains glutelin and gliadin as proteins which are commonly known as gluten (functional protein).
- The strength of the wheat flour is based on the quality of gluten used.
- The quality of baking is related to the strength of wheat.
- Maida is the refined wheat flour which is commonly used.

Structure of Wheat: Wheat grains are composed of outer bran coats, a germ and starchy endosperm.



▲ Plate 5.1: Structure of Wheat

a. Bran

- Bran is the outer layer of the kernel and constitutes 5 percent of the kernel.
- During milling the bran is discarded.
- Bran is rich in fibre, minerals, thiamine and riboflavin.

b. Aleurone Layer

- This is located just under the bran.
- It is rich in protein, phosphorous, thiamine and also contains moderate amount of fat.
- The aleurone layer makes up about 8 percent of the whole kernel and is lost in the milling process along with bran.

c. Endosperm

- This is the large central part of the kernel and constitutes 84-85 percent of the kernel.
- The endosperm consists mainly of starch and protein. But low in mineral matter, fibre, fat and vitamins.

d. Germ

- This is a small structure at the lower end of the kernel and is separated from the endosperm by the scutellum.
- It makes up 2-3 percent of the whole kernel.
- It is rich in protein, fat, vitamins and minerals.
- Germ serves as a store of nutrients for the seed during germination. During milling some of the germ is lost along with the bran and aleurone layer.

II. Types of Wheat

a. Hard Wheat: Hardness is related to the degree of adhesion between starch and protein. Hard wheat yields coarse flour and is a good source of gluten. It is used to make bread flour.

b. Soft Wheat: Soft wheat gives very fine flour and contains less amount of good quality protein. It is used for making cakes, cookies and pastries.

c. Strong Wheat: Strong wheat is used to make good quality bread because it produces large loaf volume, good crumb structure and product with good keeping qualities. It has a high protein content.

d. Weak Wheat: Low protein content in weak wheat produces only a small loaf with coarse crumb structure. The flour of weak wheat is good for biscuits and cakes.

III. Types of Wheat Flour

Some of the types of flours used for baking are as follows:

a. Bread Flour:

- It is milled from blends of hard wheat.
- The moisture content, protein content, and starch quality can be controlled.
- It is used mainly for making products leavened with yeast.

b. Soft Flour: It is used for making all types of high quality cakes and sponge cakes.

c. Self-Raising Flour:

- A mixture of wheat flour and sodium carbonate is known as self-raising flour.
- This flour is used for making puddings, cakes, pastries etc.

DO YOU KNOW?

Proofing -
It is the final rise of shaped bread dough before baking (Also called as proving or blooming)

d. All-Purpose Flour:

- It is made from blend of hard and soft wheat and has a moderate protein content.
- It is suitable for use in the yeast and quick breads, biscuits, pastries and cakes.

e. Biscuit Flour

- Biscuit flour is made from weak wheat of low protein content.
- The flour should make a dough having more extensibility, but less spring (resistance) than bread dough.
- The extensibility of biscuit flour dough may be increased by the addition of sodium metabisulphite to the dough.
- Dough pieces should retain the size and shape after being stamped out.

f. Cake Flour

- Cake flour is a medium strength flour ground from soft low protein wheat of fine structure.
- This flour allows the aerated structure to be retained after the cake has been built up.

DO YOU KNOW?

Bleaching -
A chemical or enzymatic process employed to destroy the natural yellow colour of the flour due to plant pigments namely carotenoids.
Eg: Maida is bleached refined wheat flour

g. Pastry Flour: Pastry flour is made of soft wheat which is fairly low in protein.

2. Leavening Agents:

Leavening agents are substances that cause expansion of dough and batters by releasing gases. It produces porous structure in the baked products. The important leavening agents are as follows:

a) Yeast
b) Baking powder
c) Steam obtained from heating of the dough in the oven
d) Air in a dough or batter expands in the oven while heated
e) Carbon-di-oxide from fermentation.

3. Yeast: Two forms of yeast used in baking are

- moist compressed yeast
- active dry yeast

In the bread making process yeast ferments simple sugars and produces carbon-di-oxide and alcohol. The increase in fermentation rate with time is due to two conditions in a dough.

a) Yeast cells are multiplying and the enzymes are becoming more active while the dough is prepared and held.
b) Sugar for fermentation is gradually being liberated from starch in the dough by the action of natural flour enzymes.

4. Baking Powder: Baking powders are related foods that contain particles of sodium-bi-carbonate. Baking powders are of three kinds:

- Fast acting
- Slow acting and
- Double acting powders (contain both fast and slow acting in combination with sodium bi-carbonate).

5. Egg:

- Egg acts as principle structure builder.
- It adds flavour, colour and increases the nutritive value of the baked product.

- Egg white contains protein. When whipped it forms films and entraps air. On heating it coagulates to produce rigidity.

6. Shortenings:

- Shortenings are fats and oils.
- Butter, margarine and hydrogenated oils are the most common shortenings used in baking.
- It acts as tenderizers.
- It melts and releases air bubbles which will help in the leavening action of baking powder and expanding steam.

DO YOU KNOW?

Transfat -
A fat resulting from the partial hydrogenation process that converts the cis form of unsaturated fats into trans form of unsaturated fats.
Transfats are found in Margarine and Baked goods.

7. Sugar:

- Sugar is a tenderizer in baked foods.
- It is necessary for yeast growth and indirectly aids the fermentation process.

DO YOU KNOW?

Caramelisation -
It is a non-enzymatic browning process resulting due to the heating of foods containing sugar into a nutty flavor and brown colour
Sugar caramelizes at 180°C–210°C

- Brown colour of the crust is due to the Maillard reaction between the protein and sugar which occurs during baking.
- It influences the tenderness and the volume of baked products. Honey and glucose are also used in baked products.

8. Other Ingredients:

Milk powder and skimmed milk are used in bread and bun making. It increases the nutritive value of bread. It improves flavour and gives a brown crust.

Oxidising agents like potassium bromate, potassium iodate and calcium peroxide are used to improve the handling characteristics of the dough and specific volume and texture of the finished products.

Salt has a retarding effect on yeast fermentation. Salt is used as a taste enhancer and as a preservative.

Water is important for gluten formation. It dissolves sugar and salt and serves as a dispersion media for yeast cell.

5.2.1 Principles of Baking

Baking is a heating process in which many reactions occur at different rates. Some of these reactions include the following:

1. Evolution and expansion of gases.
2. Coagulation of gluten and eggs.
3. Gelatinization of starch.
4. Partial dehydration from evaporation of water.
5. Development of flavours.

6. Changes of colour due to Maillard browning reactions between milk, gluten and egg proteins with reducing sugars, as well as other chemical changes.
7. Crust formation.
8. Crust darkening from Maillard browning reactions and caramelization of sugars.

5.3 Preparation of Biscuits and Cookies

5.3.1 Biscuit

A small baked unleavened cake, typically crisp, flat and sweet.

Ingredients Needed: The main ingredients in most types of the biscuits are as follows:

1. Flour
2. Sugar
3. Fat
4. Water and milk
5. Baking powder
6. Essence

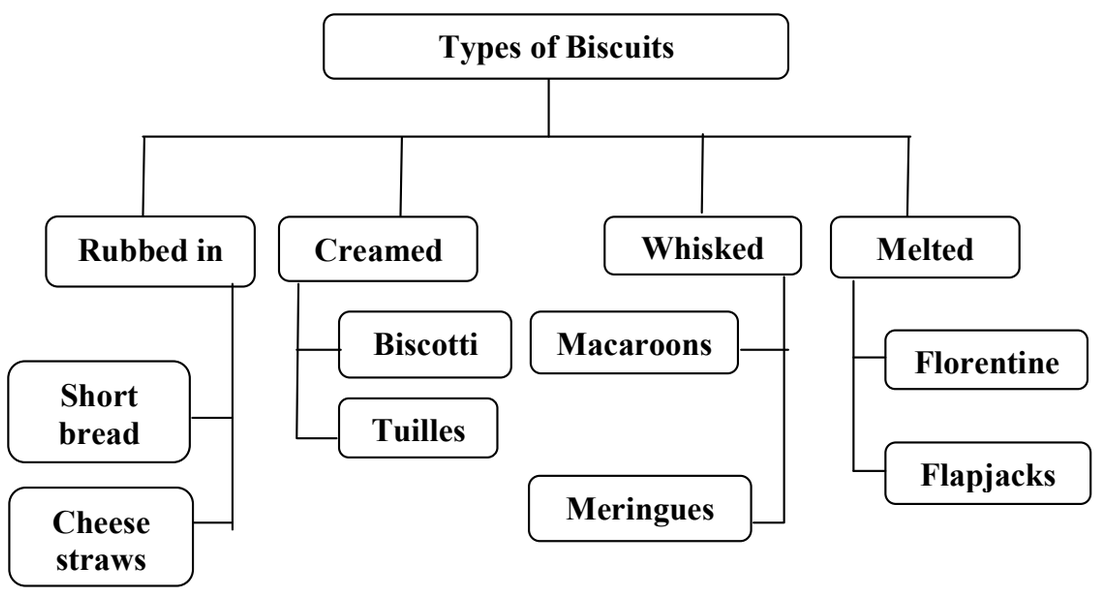
The relative proportions in which these ingredients are used differ according to the variety of biscuits being made. Aeration in biscuits is accomplished by means of baking powder.

Types of Biscuits

According to the methods of preparation, biscuits are divided into the following types:

1. Rubbed in Biscuits:

It is prepared by rubbing in the fat into the flour. This is done by placing the flour in a large mixing bowl, then adding butter which has been cut into pieces then rubbing both the ingredients together between the fingertips until the mixture resembles breadcrumbs.



▲ Figure 5.1 Types of Biscuits

The following is a basic recipe using the rubbing in method which makes around 12 small biscuits.

Ingredients		Quantity
Plain flour(maida)	:	100g
Butter, cubed	:	50g
Caster sugar	:	50g
Egg yolk	:	1
Vanilla essence	:	1g
Salt	:	a pinch

▲ Plate 5.2 Rubbed in Biscuits

Method

- Heat oven to 190°C.
- Place the flour in a large mixing bowl, add the butter cubes and rub in with fingertips until the mixture resembles breadcrumbs.
- Stir in the sugar then add the egg yolk and vanilla extract and mix to a firm dough. Add a little milk if the dough is too thick.
- Although the dough is firm, it often benefits from a short time chilling in the refrigerator or in the freezer.
- It can be rolled out to around 1cm or ½ inch thickness before being cut into shapes or can be moulded into a log, chilled or frozen well, then cut into slices
- Bake for 10–15 minutes until slightly risen and just golden. Cool on a wire rack.

2. Creamed Biscuits:

Fat and sugar should be creamed. This is done by placing softened butter in a large mixing bowl, then adding the sugar, and beating the ingredients together with a wooden spoon or electric whisk, until the mixture is well blended, light and fluffy.

Depending on the type of biscuit being made, wet ingredients such as eggs or milk are stirred in before the flour or other dry ingredients are added. These doughs are often very soft, so small spoonfuls are dropped onto baking sheets.

3. Whisked Biscuits:

The name refers to the way in which the egg content is treated. Egg whites are

▲ Plate 5.3 Creamed Biscuits

whisked until firm. Egg yolks/whole eggs are whisked together with the sugar until thickened and lightened.

These types of biscuits range from straight-forward whisked egg whites with added sugar in the form of light as air, meringues to more substantial biscuits such as coconut macaroons.

▲ Plate 5.4 Whisked Biscuits

4. Melted Biscuits:

The recipes which include liquid sweeteners like honey, golden (corn) syrup or molasses. The biscuit is prepared after melting all sweeteners (including sugar) with fat and stirred until mixed well. The other ingredients are added to the melted ingredients and mixed in the saucepan. The mixture can be soft enough to easily drop from a spoon.

5.3.2 Cookies

Cookies are baked or cooked items that are small, flat and sweet. It is prepared using

▲ Plate 5.5 Melted Biscuits

flour, sugar and some type of oil or fat. Other ingredients such as raisins, oats, chocolate chips and nuts are added, to enhance the taste, appearance and variety.

DO YOU KNOW?

Cookie -
Place of origin – Persia 7th century.
The Dutch word 'koeji' was Anglicized to cookie

Types of Cookies

1. Drop Cookies: These are made from relatively soft dough that is dropped by spoonful on to the baking sheet. During baking, the mounds of dough spread and flatten. Chocolate chip cookies, oatmeal cookies and rock cookies are popular examples of drop cookies.

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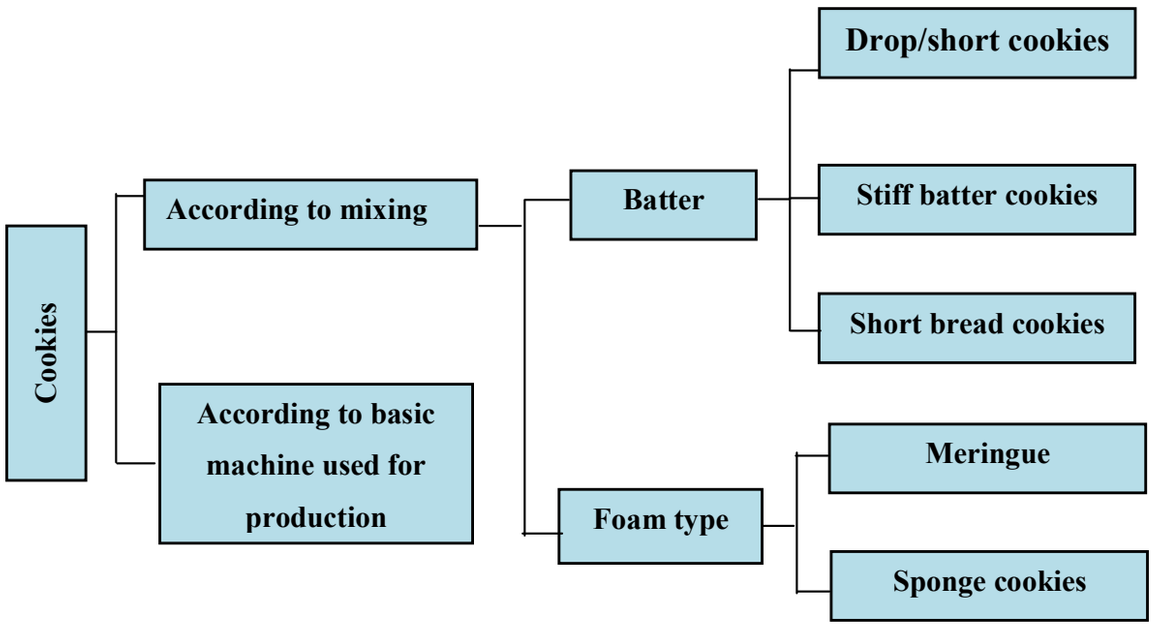


▲ Figure 5.2 Types of Cookies

▲ Plate 5.6 Drop Cookies

Ingredients	Quantity
Maida	: 2½ cups
Butter	: 1 cup
Sugar	: 1 cup
Egg	: 1
Milk	: 2 table spoons
Vanilla essence	: 1 teaspoon
Salt	: a pinch

Method

- Preheat oven to 190°C.
- Lightly coat 2 cookie sheets with vegetable oil.
- Sift flour, baking powder and salt together.
- Beat egg yolks in a mixer bowl until pale and thick.
- In a clean mixer bowl, with clean beaters, beat egg whites to soft peaks.
- Beat in sugar 1 table spoon at a time, until stiff and glossy.
- Gently fold egg yolks into egg whites.
- Fold in dry ingredients and milk until just blended.
- Drop by level tablespoonfuls 2 inches apart onto prepared cookie sheets.
- Bake for 10 minutes or until golden.
- Carefully transfer to wire racks to cool.

2. Stiff Batter Cookies: These are prepared from a stiff dough. It is made stiffer

by refrigerating before cutting and baking. Then rolled into cylinders which are sliced into round cookies before slicing. Pinwheel cookies are the best example.

▲ Plate 5.7 Stiff Batter Cookies

3. Meringue Cookies: These are light, airy, sweet, and crisp because whipped egg whites and sugar are the base ingredients. It is a gluten – free sweet cookie, without flour.

▲ Plate 5.8 Meringue Cookies

4. Sponge Cookies: These are light and airy like the meringue cookies but whole egg is used instead of only egg whites.

▲ Plate 5.9 Sponge Cookies

Tips for baking Cookies and Biscuits

1. Make sure that ingredients are at room temperature before starting.
2. Make sure that the cookie dough is nice and cold before baking.
3. Do not over mix dough when baking cookies.
4. Use powdered sugar instead of flour to roll out dough.
5. Cool the cookies and biscuits completely before storing, otherwise the steam will soften it up.

5.4 Bakery Unit

A systematic way of setting up a small-scale bakery is as follows:

One should consider the following five points while deciding to start a Bakery unit.

1. The population and purchasing capacity of the people living in that area
2. Availability of raw materials,

▲ Plate 5.10 Bakery Unit

3. Availability of electricity and other fuels.
4. Availability of potable water.
5. Transport and marketing.

1. Location

Bakery unit can be located near industries, educational institutions and public transport services.

2. Government Procedures

The detailed information on the government procedure can be obtained from the office of the State Directors of Industries and Small Industries Service Institutes.

3. Arrangement for Finance

The financial planning of project is a very important factor in a country like India, where the prices of most of the raw materials are fluctuating heavily. The main problem which is faced practically by every entrepreneur is obtaining loans from banks and financial institutions on time. Proper precautionary measures must be taken for effective planning of the finances.

4. Design of the Plan

The machinery layout can influence erection cost, operating and maintenance cost, safety and convenience.

The following points may be used as guidelines for layout planning.

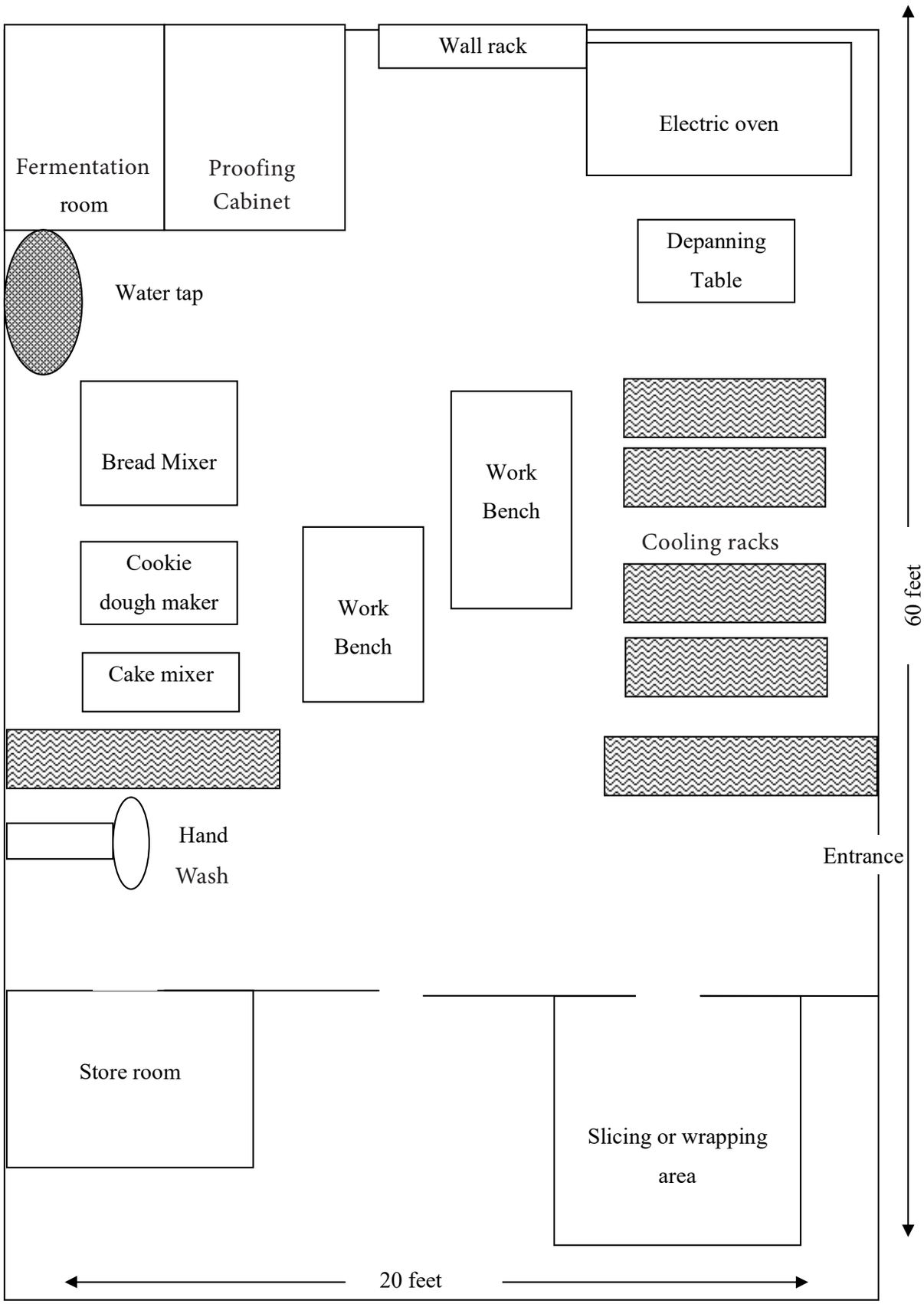
a. A flow chart indicating the flow of materials should be first prepared and then it should be arranged in a proper way.
b. Sufficient distance must be kept between each process or storage equipment of the major type to provide enough space for the movement of men, material and machinery.
c. The baking oven should preferably be located in one corner of the plant which is open from all sides rather than in the middle or centre of the plant.

5. Selection of Equipment

Type of equipment selected will depend on the type of products, the volume, the size and the profitability of the products to be manufactured.

6. Total Space Required for the Bakery

A minimum area of 1200 sq.ft.is required for the production of 3000 loaves of 400g each per day (i.e flour utilised will be approximately 900 kg) which can accommodate future expansion up to 5000 to 6000 loaves of 400g each per day.



▲ Figure 5.3 Plant Layout of a Small Bakery

7. Electricity

The electrical installations vary from place to place and therefore it is essential that data should be obtained from local electricity board regarding the approximate cost of the wiring and cable laying charges to be paid to the electricity board including deposits. The estimated cost of the consumption varies from place to place.

8. Equipment Needed for a Bakery Unit

1. Bread kneading machine
2. Bread moulding machine
3. Power operated slicer
4. Bread wrapper and sealing machine
5. Wooden tables of different sizes
6. Oven (Electrical)
7. Storage cabinets
8. Baking trays
9. Racks for cooling breads
10. Weighing scales and weights
11. Office tables and chairs
12. Bread tins
13. Cake moulds
14. Flour sieve equipment/Sifter
15. Egg beater (Small and big)
16. Vessels of different sizes
17. Spoons
18. Knives
19. Boards

Key Words

Maillard Reaction (/maɪˈjɑːr/*my*-***YAR***; French pronunciation: [majaʁ]) is a chemical reaction between amino acids and reducing sugar that gives browned food its distinctive flavor.

Meringue (/məˈræŋ/,[1]*mə*-***RANG***; French pronunciation: [məʁɛ̃g])- An item of food made from a mixture of egg whites and sugar baked until crisp.

Linkages

https://www.youtube.com/watch?v=AWo9NcOTp0U- Rubbing method

https://www.youtube.com/watch?v=uJwekkbGPns-Classic Chocolate Chip Cookies

Student Activity

- Collect recipes using yeast solution.
- Find recipes for each type of biscuit and cookie and prepare them.
- Sale of prepared products in school canteen
- Observe and evaluate a bakery near school or home, using questionnaire.

Teacher Activity

- Demonstrate the preparation of yeast solution
- Demonstrate biscuit and cookies recipe.
- Prepare a questionnaire cum rating scale to evaluate a bakery.

Questions

I. Choose the correct answer

1. Yeast raised bakery products are leavened by .....
   a. Carbon-di-oxide
   b. Sodium-bi-carbonate
   c. Incorporating air through whisking
   d. Potassium iodide

2. Maillard reaction is due to .....
   a. Coagulation of gluten and eggs
   b. Caramelization of sugar
   c. Reaction between amino acids and reducing sugars
   d. Gelatinization of starch

3. Baking is a cooking method that uses prolonged .....
   a. Moist heat
   b. Microwave
   c. Combination of dry and moist heat
   d. Dry heat

4. ..... serves as a store of nutrients for the seed during germination.
   a. Germ
   b. Endosperm
   c. Bran
   d. Aleurone layer

5. ..... is refined wheat flour.
   a. Maida
   b. Semolina
   c. bran
   d. samba rava

6. ..... contains a good source of gluten.
   a. Soft wheat
   b. Hard wheat
   c. Strong wheat
   d. Weak wheat

7. Weak wheat is used for making .....
   a. Cakes
   b. Bread
   c. Biscuits and cookies
   d. Tarts

R6RFB8

8. Bread flours should have high ..... content.
   a. Vitamin
   b. Carbohydrate
   c. Mineral
   d. Protein

9. Bread flour is usually leavened by .....
   a. Chemical agents
   b. Baking powder
   c. Yeast
   d. Incorporating air

10. ..... has a retarding effect on yeast fermentation.
    a. Sugar
    b. Baking powder
    c. Ajinomotto
    d. Salt

11. ..... is an oxidising agent used to improve the handling characteristics of the dough.
    a. Potassium bromate
    b. Potassium metabisulphate
    c. Sodium-bi-carbonate
    d. Potassium Iodide

12. A ..... is a small baked unleavened cake, typically crisp, flat and sweet.
    a. Cookie
    b. Biscuit
    c. Tart
    d. Meringue

13. ..... is a drop cookie.
    a. Pinwheel cookie
    b. Macaroon
    c. Short bread
    d. Oatmeal cookie

14. Aeration of biscuits is accomplished by means of .....
    a. Baking powder
    b. Yeast
    c. Potassium iodide
    d. Salt

15. The total space to bake 3000 loaves of 400 g each per day is .....
    a. 2000 sq.ft.
    b. 1200 sq.ft.
    c. 1500 sq.ft.
    d. 17000 sq,ft.

II. Write in 3 lines (3 marks)

1. Indicate the uses of wheat.
2. Write a note on self- raising flour.
3. What are the leavening agents?
4. Enumerate the conditions for yeast fermentation?
5. Brief on baking powders.
6. How is egg used in baking?
7. Classify biscuits.
8. How are cookies classified?
9. Indicate the guidelines to be followed while setting up a bakery unit.
10. Write any 2 products made using a) baking powder b) yeast

III. Write in a paragraph (5 Marks)

1. Draw the structure of wheat and explain.
2. State the principles of baking.
3. How are bakery products classified?
4. Explain the types of wheat.
5. Why tenderizers are used in baking? Explain
6. List the equipment needed for a bakery unit.
7. Draw the Layout of a small bakery unit.
8. Write a recipe for preparing a cookie.
9. Give a standardized recipe for preparing a biscuit.
10. What are the types of yeast? How is yeast prepared?

IV. Answer in detail

1. What are the types of wheat flour? Explain
2. Explain biscuits in detail.
3. Give a detailed account on cookies.
4. How will you set up a bakery unit?
5. List the baking ingredients. Explain any 4.

Chapter 6 Food Preservation

Learning Objectives

- Gain knowledge about significance, principles and methods of preservation.
- Understand the preservation techniques and know the products of salting, pickling and fermentation.
- Apply the preservation techniques to preserve seasonal foods to increase availability.
- Formulate and market different recipes to become a successful entrepreneur to start a small scale food processing unit.

Preservation of food is a major step in assuring adequate food supply for a nation. Foods that are obtained from plant and animal sources should be preserved well. This will ensure continuous supply throughout the year with no shortage of food. Food preservation is the process of prevention of decay or spoilage of food and helps it to be stored in a fit condition for future use.

6.1 Significance and Principles of Food Preservation

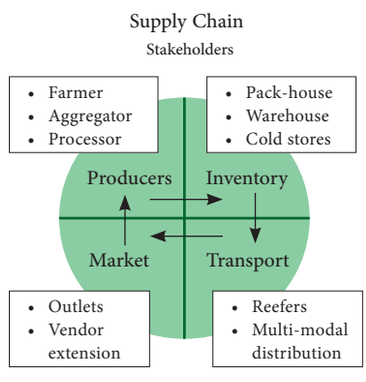
Food preservation is a significant procedure in keeping food safe. It ensures the following:

1. Increases the shelf life of food
2. Ensures food supply during scarcity and drought
3. Adds variety in the diet
4. Saves time and energy
5. Minimizes food wastage
6. Stabilizes the price of food and
7. Increases the availability of seasonal foods throughout the year.

DO YOU KNOW?

Supply Food... to stop food loss

- Collaborate with Source or Producer.
- Modify practices to take adavantage of technology!
- Keep it in motion– dynamics supply chain!
- From FIFI/ LIFO to FEFO (First Expire, First Out)!



Organisation means: collaboration, resource building, good practices, and promotes transparency in value chains.

Table 6.1 Basic Principles and Methods of Food Preservation		
S.No.	**Basic principles**	**Methods of food preservation**
1	Proper handling of food stuffs and creating hygienic environment	Keeping away from microorganisms (Asepsis)
2	Destruction or inactivation of food enzymes	Blanching, pressure cooking and sterilization
3	Changing the temperature that spoil food	Refrigeration, freezing methods and using high temperature
4	Removal of moisture and water from food	Complete and partial drying
5	Removal of air	Canning, bottling and vacuum packing
6	Changing the pH value that causes food spoilage	Addition of salt, sugar and chemical preservatives

Principles of Food Preservation

I. Prevention or delay of microbial decomposition

a) By keeping away undesirable microorganisms. (**Eg:** asepsis)
b) By removal of microorganisms. (**Eg:** filtration)
c) By hindering the growth and activity of microorganisms. **Eg:** refrigeration, drying, dehydration, addition of chemical preservatives.
d) By killing the microorganisms. **Eg:** by heat or radiation

II. Prevention or delay of self-decomposition of food

a) By destruction or inactivation of enzymes **Eg:** by blanching.
b) By prevention or delaying the chemical reactions. **Eg:** prevention of oxidation using lime juice/citric acid.

III. Prevention of damage caused by insects, animals and mechanical causes

The details of basic principles and methods of food preservation are given below:

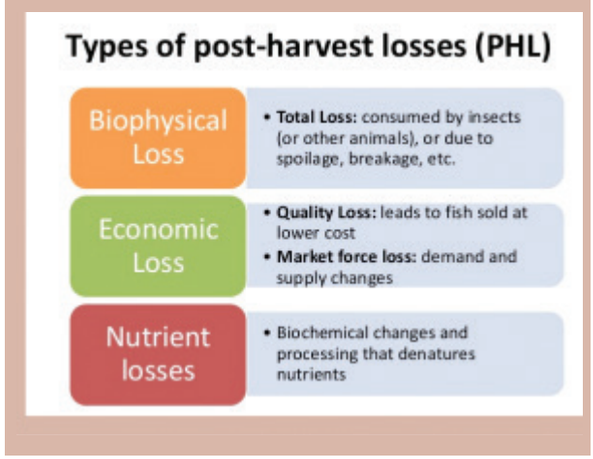
6.2 Methods of Food Preservation

Food preservation methods can be classified as follows

I. Physical Methods

A. Preservation by low temperatures
   1. Refrigeration
   2. Freezing
B. Preservation by high temperature
   1. Pasteurization
   2. Canning

DO YOU KNOW?



C. Preservation by drying
   1. Sun drying
   2. Drying by mechanical driers
      (i) Spray drying
      (ii) Foam mat drying
      (iii) Drying by osmosis
      (iv) Freeze drying
D. Preservation by irradiation

II. Chemical Methods

A. High concentration of salt
B. High concentration of sugar
C. Using chemical preservatives

III. Fermentation

6.2.1 Physical Methods

A. Preservation by Low Temperatures

1. Refrigeration: The temperature maintained in the refrigerator is 0 to 5°C. Enzymatic and microbial changes in foods are slowed down considerably. Perishable foods like eggs, dairy products, meat, sea foods, fruits and vegetables are stored in refrigerators. Food can be stored safely for few days or a week.

2. Freezing: The temperature of freezer is –18 to –40°C. Microbial growth is prevented completely and the action of food enzymes greatly reduced. Frozen foods have better quality and needs uninterrupted supply of electricity while storing. Foods like poultry, meat, fish, peas, vegetables, juice concentrates can be preserved for several months by this method. In vegetables, enzyme action may still produce undesirable effects on flavour and texture during freezing. Various methods of freezing include slow freezing, quick freezing, cryogenic freezing and dehydro freezing.

Quick freezing is an ideal method of preserving nearly all baked products. Bread frozen at –22°C or below retains its freshness for many months. Cakes, cookies, short cakes, waffles and pancakes are also frozen and marketed frozen.

B. Preservation by High Temperature

Food commodities in which pasteurization is employed include milk, beer, wines and fruit juices.

1. Pasteurization: Pasteurization is a mild heat treatment that kills a part but not all the microorganisms present and usually involves the application of temperature below 100°C.

▲ Plate 6.1 Pasteurization Treatment

There are three methods of pasteurization.

a. **Bottle or Holding Pasteurization:** This method is commonly used for the preservation of fruit juices. The extracted juice is strained and filled in bottles. The bottles are then sealed air tight and pasteurized.
b. **Over Flow Method:** Juice is heated to a temperature about 2.5°C higher than the pasteurization temperature and filled in hot sterilized bottles.

The sealed bottles are sterilized at a temperature 2.5°C lower than filling sealing temperature and then cooled.

c. **Flash Pasteurization:** The juice is heated rapidly to a temperature of about 5.5°C higher than the pasteurization temperature and kept at this temperature for about a minute. This method has been developed specially for canning of natural orange juice, grape and apple juice. It has the advantages of minimizing the flavor loss and preserving the vitamins.

2. Canning: Canning is the process in which the foods are heated in hermetically sealed (airtight) jars or cans to a temperature that destroys microorganisms and inactivates enzymes that can cause food spoilage.

The general steps to be adopted for canning foods are cleaning, blanching, filling, exhausting, sealing, sterilizing, cooling and labeling.

i. **Cleaning:** It is the first step in canning. Thorough cleaning of the product to be canned helps to remove most of the spoilage organisms.

▲ Plate 6.2 Canning

ii. **Blanching:** This process serves as an additional hot water wash. It inactivates the food enzymes and fixes the natural colour of the product. It also softens the fibrous plant tissues and facilitates removal of skin. In this process the raw food material is immersed in hot water or exposed to live steam for 2–5 minutes and immediately dipped into cold water to prevent further exposure to heat.

iii. **Filling:** Either manually or by using machinery the contents can be filled in the cans. A headspace of 6–9mm depth above the level of food in the can must be left.

iv. **Exhausting:** Gases are expelled by passing the open can containing the food through an exhaust box in which hot water or steam is used. It expands the food and expels air and other gases from contents and also from the head space area of the can.

v. **Sealing:** The exhausted containers are immediately sealed to avoid re-contamination.

vi. **Sterilization:** To bring about complete sterilization, thermal process is carried out. This ensures the destruction of spoilage microorganisms. This is usually done by the application of steam under pressure.

vii. **Cooling:** The containers are cooled rapidly to check the action of heat and prevent unnecessary softening of the food or change in the colour of the contents. It can be done by means of air or water.

viii. **Labelling:** The containers are labelled with nutritional characteristics of the food inside.

C. Preservation by Drying

Microorganisms need moisture to grow. When exposed to sunlight or subjected to dehydration, the moisture in the food is removed and the concentration of water is brought below a certain level. This prevents the growth of microorganisms and thereby spoilage of food. Food preservation by drying is one of the oldest methods practiced from ancient times. This method consists of exposing food to sunlight and air until the product is dry. It is a very useful and economical process.

Both the terms 'drying' and 'dehydration' mean the removal of water. Drying is used to remove moisture by the application of unconventional energy sources like sun and wind. Dehydration means the process of removal of moisture by the application of artificial heat under controlled conditions of temperature, humidity and air flow.

DO YOU KNOW?

Traditional methods of controlling food grain loss -

- Mixing of inert dust such as sand, clay and ash with the grain prevents the entry of insects.
- Mixing the powder of pungam, neem or nochi leaves with the grains in the ratio of 1:100 help to control the insects.

Treatment of Foods Before Drying

1. Selection and sorting for size, maturity and wholesomeness
2. Washing, especially fruits and vegetables
3. Peeling of fruits and vegetables by hand, machine or knife
4. Subdivision into halves, slices, shreds or cubes
5. Blanching or scalding of vegetables and some fruits like tomatoes and peaches
6. Sulphuring of light coloured fruits and vegetables by exposure to sulphur-di-oxide gas.

ii. Sun Drying: It is limited to regions with hot climates and dry atmosphere and to certain fruits such as raisins, prunes, figs, apricots, pears and peaches. It is a slow process. Many Indian foods are preserved by sun drying. Papads, vadams and vathals

▲ Plate 6.3 Sun Dried Brinjal

▲ Plate 6.4 Sun Dried Sundaikai

▲ Plate 6.5 Salted dried

are made using this principle. Vegetables like sundaikai, cluster beans, bitter gourd and green chillies are preserved by this method. Fish and meat are also sun dried. The common dried fish or karuvadu (local name) is a good example for sun drying.

ii. Drying by Mechanical Driers: Artificial drying involves the passage of hot air with controlled relative humidity over the food to be dried or the passage of the food through such air. Fruits, vegetables, nuts, fish and meat can be successfully preserved by this method. In the dehydration process, artificial drying methods like spray drying, vacuum drying, drum drying and freeze drying are used for drying foods. Although it is expensive when compared to natural sun-drying process, it is very hygienic, rapid and the products obtained are uniform in colour because the temperature and relative humidity can be maintained.

i. Spray drying: Milk and eggs are dried to a powder in spray driers in which the liquid is atomized and sprayed into hot air steam or almost instant drying.
ii. Foam mat drying: Foam mat drying may be used commercially to preserve orange and tomato juice. In this process a small amount of edible foam stabilizer is used. The foam is spread in a thin layer and dried in a steam of hot air. The product gets separated easily into small particles on cooling.
iii. Drying by osmosis: Drying by osmosis results when fish is heavily salted. In this case, the moisture is drawn out from all the cell tissues. The water is then bound with the solute making it unavailable to the microorganisms. In osmotic dehydration of fruits, the method involves the partial dehydra-

▲ Plate 6.6 Spray dried milk powder

▲ Plate 6.7 Dehydrated Foods

tion of fruits by osmosis in a concentrated sugar solution or syrup.

iv. Freeze drying: Removal of water from a frozen product by sublimation is called freeze drying. Freeze dried foods will be of superior quality with light and porous texture.

▲ Plate 6.8 Machine Dried Vadagam

D. Preservation by Irradiation

Food irradiation also known as cold sterilization is another preservation technique. The foods are bombarded by high energy rays called gamma rays or by fast moving electrons to kill bacteria, fungi and insects and in some cases to delay fruit ripening or prevent sprouting in onions and potatoes. The goal of irradiation is to kill the microorganisms and inactivate the enzymes without altering the food.

▲ Plate 6.9 Irradiated Foods

6.2.2 Chemical Methods

A. Salt or Brine

It is an ancient preservation technique. Food is treated with salt or strong salt solution. Salt causes high osmotic pressure and shrinking of cell, dehydrates foods and microbes by drawing out moisture.

B. High Concentration of Sugar

Sugar has the ability to bind water and make it unavailable for microbial growth. It reduces the solubility of oxygen in moisture, which is essential for the growth and multiplication of microorganisms. Apples, oranges, guavas, grapes and pineapples are suitable for making jams and jellies. The fruits should be just ripe because the pectin content is high in such fruits.

▲ Plate 6.10 Orange Squash

C. Using chemical preservatives

The chemicals when added interfere with the cell membrane of the microorganisms, their enzyme activity or their genetic mechanisms. They also act as antioxidants. The common chemical preservatives permitted are

1. Benzoic acid (including benzoates)
   Sodium benzoate is a salt of benzoic acid and is used in preservation of coloured fruit juices and squashes.
2. Sulphur dioxide (including sulphites):
   Potassium meta-bi-sulphite is used as a source of sulphur dioxide when it is added to the juice or squash. When used in fruits with deep colours like blue grapes, jamun, watermelon it bleaches the colour and hence in such cases benzoic acid is desirable.
3. Organic acids and their salts:
   Foods can be preserved by adding lactic, acetic, propionic, citric acids and their salts. Nitrates and nitrite compounds are used to preserve meat and fish products. It gives desirable colour, flavor and discourages the growth of micro-organisms. It also prevents toxin formation by the microorganisms in food.

6.3 Salting and Pickling

6.3.1 Salting

Salt is added to enhance taste and extend shelf life in foods such as butter, cheese, vegetables, bread and meat products. Dry salting is used for meat, mango, amla and fish.

▲ Plate 6.11 Sundried Mango

▲ Plate 6.12 Sundried Mor Milagai

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6.3.2 Pickling

It is also an ancient preservation technique. The preservation of fruits and vegetables using common salt, vinegar, oil and spices are referred to as pickling. The layer of oil that floats on the top of pickles prevents the entry and growth of microorganisms like moulds and yeast. Spices like turmeric, pepper, chilli powder and asafoetida retard the growth of bacteria. Vinegar provides an unfavorable acidic environment for microbial growth. The salt added absorbs water and prevents the growth of micro-organisms.

Pickles are good appetizers. They add palatability to the meal. They help in digestion by stimulating the flow of gastric juices. The nutritive value of the pickles varies depending on the raw materials and methods of preparation adopted. Raw mangoes, lemon, amla, ginger, garlic,

tomato, chilli, mixed vegetables such as potato, carrot, beans, peas, cauliflower are used to prepare pickle.

▲ Plate 6.13 Mango pickle

▲ Plate 6.14 Lemon pickle

▲ Plate 6.15 Vadu Manga or Mangai pickle

I. Common Ingredients used for Pickling

a. Salt: Common salt is used for pickling. Salt should be free from lime (Ca CO_3) as it reduces the acidity of the vinegar in which brined vegetables are packed. Vegetables do not ferment when they are strongly brined by large quantity of salt. Spoilage of pickle is prevented by adding sufficient amount of common salt.

b. Vinegar: Vinegar acts as a preservative. To avoid dilution of the vinegar by the water liberated from the tissues, the vegetables are generally placed in strong vinegar of about 10 per cent acidity for several days before pickling.

c. Sugar: Sugar used in the preparation of sweet pickles should be of high quality. Sugar helps in the preservation of products in which it is used.

d. Spices: Spices are generally added to all the pickles but the quantity added depends upon the kind of fruit or vegetable taken and the kind of flavour desired. Spices generally used are cardamom, dry chillies, cinnamon, clove, coriander seeds, pepper, turmeric, mustard, cumin and fenugreek seeds. Condiments such as ginger, garlic, mint, curry leaves and asafoetida are used. Spices are used either in the fresh or in the dry powder form.

e. Water: Only potable water should be used for the preparation of brine. Hard water interferes with the normal salt curing of the vegetables.

f. Colouring and Hardening Agent: Natural colouring agent, turmeric is commonly used in pickles, sauces and ketch

ups. Artificial colours are not generally added to pickle, although used at permissible limits. Alum is sometimes used to give firmness to the vegetables used for pickling.

II. Types of Pickles

There are five types of pickles.

a) Salt Pickles: Salt pickle adds taste to food and enhances digestive ability. The method of preparation involves addition of salt to vegetable and fruit pieces and allowing it to soak.

b) Spiced Pickle: This type of pickle is tastier since oil and spices are added for seasoning and preservation. Spoilage of pickle is prevented by the addition of salt and spices.

c) Pickles Preserved by Lemon Juice: Vegetables and garlic pickles made with lime juice adds taste.

d) Vinegar Pickle: Vinegar is a dilute acetic acid. Vinegar is used as a preservative for preparing tomato sauces, tomato pickle, chilli sauce and meat pickle.

e) Sweet Pickle: Sweet pickle is prepared by adding garam masala powder and sugar to fruits and sweet vegetables. Vegetables and fruits should be soaked in sweet vinegar and boiled for 5 to 6 minutes and mixed well, cooled and packed in the jar.

III. Types of Spoilage in Pickles

Table 6.2 Spoilage of Preserved Pickles

S.no	Defect	Cause	Prevention
1	Shrivelling	Placing vegetables like cucumber directly in a very strong solution of salt or sugar and vinegar	Weak solutions should be used to start with, increasing their strength gradually.
2	Bitter taste	Use of strong vinegar, prolonged cooking of spices, Over spicing	Adding adequate vinegar and spices
3	Blackening	Iron entering through the brine or from the equipment, mould growth	Use of stainless steel equipment and dry spoons
4	Scum formation	Growth of wild yeast, growth of putrefactive bacteria causing the vegetables to become soft and slippery.	Maintain sufficient acidity
5	Cloudiness	Chemical reaction between vinegar and the minerals such as calcium, magnesium or iron.	Use of stainless steel equipment
6	Stickiness	Certain bacteria that thrive in salt but not in acid	Maintain sufficient acidity
7	Fermentation	Yeast growth	Cover the jars with tight lids, keep jars under Sun to destroy yeast
8	Flabbiness	Blanching for long time, prolonged cooking	Blanch for 2–3 minutes, use adequate time for cooking

Table 6.2 Spoilage of Preserved Pickles			
S.no	**Defect**	**Cause**	**Prevention**
9	Mould growth	Insufficient salt, spices and oil, surface moisture not completely evaporated after blanching, jars not sterilized properly, jars stored in a hot moist place	Use adequate salt, spices and oil, keep the blanched vegetables/fruit under Sun to evaporate the moisture completely, sterilize the jars properly, store in a cool dry place, oil should be 1 or 2 inches above the pickles
10	Dull and faded colour	Use of over mature and poor quality vegetables and fruits	Use just ripe, firm vegetables and fruits free from any cuts and blemishes.

6.4 Fermentation

Fermentation is one of the age old method of food preservation techniques. Fermentation extends the shelf life of the foods similar to that of salting and drying. The term fermentation refers to both the anaerobic and aerobic breakdowns of carbohydrates and carbohydrate-like materials. Fermentation means the process of the reaction between microorganisms and organic compounds in natural conditions. Apart from carbohydrate, microorganisms and enzymes react on protein and fat by releasing carbon-di-oxide and other gases.

a. Anaerobic condition: In cheese production, due to Streptococcus lactis bacteria, lactose is converted to lactic acid under anaerobic condition.

b. Aerobic condition: In vinegar production, due to Acetobacter bacteria ethyl alcohol is oxidised to acetic acid in aerobic condition.

Foods Produced by Fermentation

1. Alcoholic Beverages

Wine: Yeast is present on the skin of grapes. Fermentation process starts when yeast reacts with the sugars of grapes to convert them into alcohol.

Beer and Ale: These contain malted cereals which are fermented by yeast to yield 3–7% of alcohol. The type of yeast, quantity and fermentation temperature control the alcohol production.

2. Vinegar Preparation: In the presence of oxygen, *Acetobacter* bacteria convert alcohol to acetic acid. Vinegar can be prepared from carbohydrate sources like cereals and fruits.

3. Cheese Production: *Streptococcus lactis* bacteria changes milk sugar into lactic acid. This acid curdles milk into cheese.

4. Citric acid Production: Citric acid is produced from yeast, mould and bacteria. It is used in the production of fruit beverages.

Uses of Fermentation

1. Fermentation extends the shelf life of foods.
2. It enhances the growth of microorganisms producing acid and alcohol.
3. It prevents the growth of lipolytic and proteolytic microorganisms.
4. Vinegar obtained by fermentation has industrial importance.

Key Words

Aerobic	:	Presence of oxygen
Asepsis	:	Keeping out of microorganisms
Anaerobic	:	Absence of oxygen
Anti-oxidants	:	Agents preventing oxidation
Canning	:	Foods are heated in hermatically sealed (airtight) jars or cans to a temperature that destroys microorganisms
Exhausting	:	Process involving expelling of gas by passing the open can containing the food through an exhaust box
Shelf life	:	Keeping quality
Sterilization	:	Destruction of spoilage microorganisms by heat treatment.

LINKAGES

https://www.youtube.com/watch?v=UWhkFYDB8J4-Need and Benefits of food Preservation

https://www.youtube.com/watch?v=eksagPy5tmQ-The beneficial bacteria that make delicious food

https://www.youtube.com/watch?v=RXDSJQWylUE-NEWS7 TAMIL Mango pulp units in Krishnagiri Tamilnadu

https://www.youtube.com/watch?v=UxFdzkzAOEo-"chakka varuthathu-YouTube

https://www.youtube.com/watch?v=z3iQ9fpylxg-RTS juice processing and packaging line-YouTube

Student Activity

- Market survey of different preserved foods available in the market
- List the traditional preserved foods used in their homes
- Prepare charts/cards or aids to market the products
- Exhibition cum sale of preserved products developed by the students within the campus
- Inspect the contents in nutritional labeling of preserved foods
- List the preservatives and artificial colours used in commonly used preserved foods.

Teacher Activity

- Prepare a questionnaire to do market survey
- Standardize the commonly used preserved food
- Conduct of workshop by the self-help group women or mothers of students on dry powders and pickling
- Train the students to pack the products using a sealing machine.
- Motivate the students to develop entrepreneurial skills
- Specify any five mandatory requirements for evaluating a label and discuss its significance
- Discussing the ill effects of artificial colours and excess use of preservatives on health
- Create awareness on the schemes of $MSME_S$ and industrial opportunities in the respective districts (www.chennaimsmedi.com)
- Visit to a fruit and vegetable processing unit

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Questions

I. Choose the Correct Answer

1. Science which deals about the process of prevention of decay is ……
   a. Food preservation
   b. Food science
   c. Food processing
   d. Food technology

2. The preservation of fruits and vegetables using salt, vinegar, oil and spices is known as ……
   a. Salting
   b. Pickling
   c. Drying
   d. Canning

3. Keeping away undesirable micro organisms is ……
   a. Filtration
   b. Asepsis
   c. Dehydration
   d. Drying

4. Inactivation of food enzymes is known as ……
   a. Asepsis
   b. Blanching
   c. Sterilization
   d. Irradiation

5. The temperature maintained in refrigeration storage is ……..
   a. 0 to 5^0C
   b. –10 to -15^0C
   c. –15 to 20^0C
   d. –20 to 25^0C

6. Destruction of microorganism is possible by ……..
   a. Exhaustion
   b. Sterilization
   c. Fermentation
   d. Refrigeration

7. The temperature maintained in the freezer is ……. ^{0}C
   a. –4 to –29
   b. –32 to –40
   c. –18 to –34
   d. –18 to 40

8. In canning a head space of ……. depth above the level of food must be left
   a. 6–9 mm
   b. 9–12 mm
   c. 12–15 mm
   d. 3–6 mm

9. Sugar has the ability to bind water thereby the microbess are …….
   a. reduced
   b. increased
   c. arrested
   d. killed

10. Sprouting of onions and potatoes are prevented by ……
    a. Drying
    b. Irradiation
    c. Chemical preservation
    d. Salting

11. Coloured fruits and its juices are preserved by adding …….
    a. Sulphur dioxide
    b. Sodium benzoate
    c. Potassium meta bi-sulphate
    d. Citric acid

12. Milk powder is an example of ……. drying.
    a. Foam
    b. Spray
    c. Osmosis
    d. Sun

13. Removal of water from a frozen product by sublimation is called ……. drying.
    a. Spray
    b. Foam mat
    c. Osmosis
    d. Freeze

II. Write in three lines (3 marks)

1. Define preservation.
2. Define blanching.
3. What is pickling?
4. Define fermentation.
5. Define pasteurization.
6. List the products preserved by fermentation.
7. Enlist the uses of irradiation.
8. Differentiate drying and dehydration.
9. Specify any two chemical preservatives.
10. Write short notes on salting.
11. Enlist the role of spices in food preservation.
12. What is a sweet pickle? Give example.
13. Specify the role of organic acids in preservation.
14. Mention the reasons of shriveling in pickles.
15. Indicate the preventive measures to avoid bitterness in pickles.

III. Write in a paragraph (5 Marks)

1. What are the principles of food preservation? Give examples.
2. How do salt and sugar act as preservatives?
3. Enlist the significance of food preservation.
4. Tabulate the basic principles of food spoilage and methods of preservation.
5. Classify pickles and write on the common ingredients used for pickling.
6. Give an account on the products obtained by drying.
7. Illustrate an aid to popularize mango pickle for sale.
8. Write on any two contents in nutritional labeling of preserved foods.

IV. Answer in detail (10 Marks)

1. Explain the physical methods of preservation?
2. Give a brief account on any four techniques employed in food preservation.
3. Enumerate the defects in pickles and their preventive measures.
4. Define and explain the steps in canning.
5. Describe the process of fermentation with suitable examples.
6. Explain the traditional and modern drying methods for preserving foods.

Chapter 7 Menus and Cuisines

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Learning Objectives

- Understand the different types of menu.
- Acquire skill in planning a menu.
- Identify the different types of cuisines and courses of menu.

A menu is a list of food and beverages served in a food service. It is a presentation of detailed list of dishes in a catering operation and may include full meals or snacks.

Cuisine is a style or method of cooking and characteristic of a particular country or region.

▲ Plate 7.1 Restaurant

7.1 Menu Planning

Planning menus become essential when food has to be purchased, prepared and served in large quantities to people of varying tastes and requirements.

The success of a food service operation no matter, what its size, depends primarily on those who plan the menus and how it is made into a tasty dish. In other words menu is the focal point around which the entire functions of a food service depend on. Good menu planning requires skills. People responsible for menus should have the following qualifications:

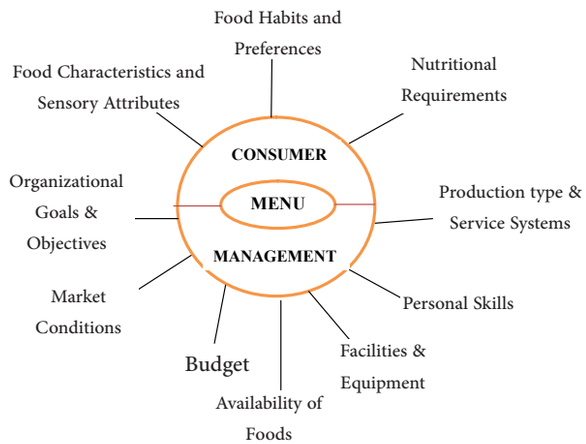
- Knowledge on different methods of preparing and serving foods.

DO YOU KNOW?

Origin of Menu -
The word 'menu' is French in origin. It ultimately derives from Latin 'minitus', something made small in French.

- Knowledge on creative presentation of food
- Knowing the expectations of the customer
- Updating knowledge on standard recipes, seasonal foods, profitable dishes, price list and popular food combination.

So, there are some factors to be followed in a wise menu planning for a food service operation.



▲ Figure 7.1 Factors to be considered in Menu Planning

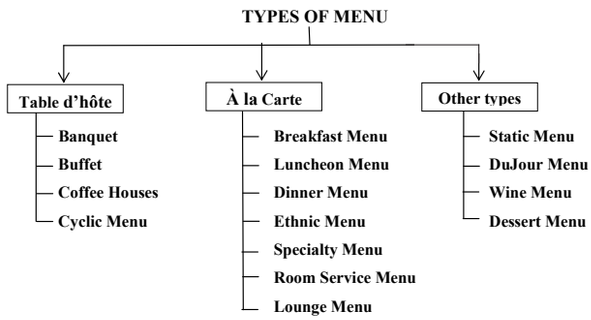
DO YOU KNOW?

Online Menu -
Several restaurants owned and start up online food ordering using websites.

7.2 Types of Menu

Menu could be offered in different ways in different food service organization but they are basically of two types. It is classified as follows:

▲ Plate 7.2 Table Setting in a Restaurant



▲ Figure 7.2 Types of Menu

I. Table d'hôte or Set Menu

- It is actually a classified menu or otherwise called as a 'set menu'.
- It does not provide any choices among food items offered in each course
- It has a fixed selling price and assured quality of food
- It is easy to produce and requires less kitchen space, labour and service equipment.

▲ Plate 7.3 Menu Display

- A typical Table d'hôte menu in India is served in the form of 'Thali' meals.

Table d'hôte includes the following order.

- Appetizers
- Soups
- Salads
- Entrées
- Desserts

Indian Menu (Table d'hôte)	
Soup	: Cream of tomato soup
Salad	: Green salad
Starters	: Chilli Gobi
Entrée (Main)	: Butter Naan, Paneer Masala
Rice	: Vegetable Pulao, Onion Raitha
Dessert	: Vanilla Ice Cream

The Table d'hôte menu can be followed in:

a. Banquet: It offers a selection of fixed items given at a set price and is arranged for formal functions.

b. Buffet: A buffet can be a large list of dishes seen in weddings or few as in a working lunch given in offices. Usually in buffet service the food is neatly arranged and the guests help themselves or it is self service. The food items are predetermined with set price and set time. It may vary depending on the occasion and the operational cost.

c. Coffee House: A few snacks with limited choices in food and beverage are given in coffee house. Usually coffee, tea and other hot beverages are sold. This menu is a set menu which offers food often 24 hours of the day with limited choices.

d. Cyclic Menu: A set of menu for various meals (breakfast, lunch, dinner) repeated at specific intervals ie. Every seven days and rotates again from the first day. Example: Hostel, mess, school food service and industrial canteens.

II. À la Carte Menu (or) Selective Menu

- It offers wide choice in food and beverages within each course and its categories.
- It is prepared after the order has been taken with a particular preparation time.
- It offers colourful and high cost seasonal foods.
- All entrées, dishes, salads and desserts are ordered separately.
- The different types of À la carte menus are Breakfast menu, Luncheon menu, Dinner menu, Ethnic menu (Food from different countries), Specialty menu and Lounge menu (served in hotels and inns).

▲ Plate 7.4 Dosa

▲ Plate 7.5 Vada

▲ Plate 7.6 Poori

Indian Menu

(À la Carte)

Breakfast Items	Price (Rs.)
Vadai	: 26.00
Sambarvadai	: 26.00
Roast	: 45.00
Two in one roast	: 60.00
Ghee/Masal/Onion Roast	: 45.00
Uttappam	: 45.00
Onion uttappam	: 54.00
Parotta (1)	: 43.00
Chappathi (2)	: 48.00
Romali roti with gravy	: 70.00
Poori (1)	: 28.00

III. Other Types of Menu

a. Static Menu: This menu offers same dishes all through the year **Eg:** Fast food restaurants.

b. DuJour Menu: "Specialty of the House" – prepared on the basis of seasonal items and combination of both À la carte and table d'hôte.

c. Wine Menu: It is developed only with the extensive selection of wines.

d. Dessert Menu: It offers particular list of desserts that are offered by any establishment.

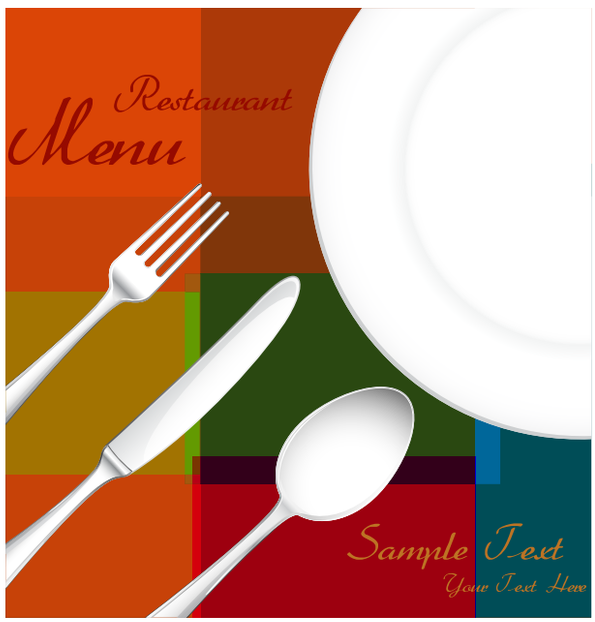
7.3 Preparation of Menu Card

A menu is the first thing customer sees when they come into the restaurant and the last thing they look at before they order. This makes the menu one of the most valuable marketing tools. So the restaurant menu should be prepared attractively.

Simple steps for preparing a menu card are as follows:

- Choose the restaurant's concept (Kind of cuisine)
- Decide the menu items (minimum 10-12 items)

▲ Plate 7.7 Menu Card



▲ Plate 7.8 Menu Card Design

- Add a few high end or specialty items(choose 2-3 items that are little more expensive).
- Create unique names for the items in the menu (ex: Chicken manchow – Chinese soup).
- Write down the menu items.
- Order the menu in a logical way (Breakfast, Lunch, Dinner).
- Pricing the menu – adjust menu prices to maximize profits, average income of the people in that area and end prices in whole numbers.
- Create a rough draft by looking through different templates, power point and websites.
- Choose a colour scheme that matches the style of the restaurant.
- Select a presentation style that fits with the restaurant's concept.
- Use a menu template for an easier menu design.
- Take pictures of the food to create an appetizing menu
- Determine how many menu cards needed based on the number of tables.
- Proof read the menu before printing.

DO YOU KNOW?

Restaurant -
Restaurant comes from the French term 'restaurer' which means "to provide food for". Common examples of restaurants include burger joints, cafeterias, pizzerias, sandwich shops, steak houses, seafood snacks, hot dog stands, ice cream parlors, Chinese takeouts, bakeries and fine dining establishments.

7.4 Types of Cuisines

A cuisine is a cooking style denoting varieties of food prepared by a restaurant from a certain region or country. There are different types of cuisines all over the world. Each country or region has its own style.

7.4.1 Factors Affecting a Cuisine

- A cuisine is frequently named after the region or place where it is originated.
- It is primarily influenced by the locally available ingredients, the religion and the culture.
- The area's climate determines the native foods that are available.
- The trade among different countries also largely affects a region's cuisine.

▲ Plate 7.9 Cuisines

7.4.2 Common Cuisines

The common cuisines are Indian, International and fusion cuisine.

I. Indian Cuisines: Indian cuisines are as diversified and unique as its culture and country encompasses a wide variety of regional and traditional cuisines. Indian food is often thought of as an 'exotic cuisine' with charm of its own, it has such a great variety of taste, colour and aroma.

II. Regional Cuisine: It is based upon national, state or local regions. Regional cuisines may vary based upon food availability and trade, varying climates, cooking traditions and practices and cultural differences. Each state has evolved its very own cuisine influenced by the availability of certain raw foods of the region. The cooking style varies from region to region and it is largely divided into South Indian and North Indian cuisine.

Characteristic Features

- Indian cuisine gives the range of diversity in soil type, climate, culture, ethnic group and occupations.
- The staple food varies with region to region. In the southern part of India, rice is the staple food while in the northern part it is wheat.
- There are special foods prepared for occasions like festival in all the regions.
- Indian cuisines use locally available spices, herbs, vegetables and fruits.
- A three meal balanced diet pattern is the most common feature in Indian cuisine.

1. North Indian Cuisine: North India has extreme climates – summer is hot and winter is cold. To quote a few, the region includes the following states: Jammu and Kashmir, Himachal Pradesh, Punjab, Maharashtra, Madhya Pradesh.

▲ Plate 7.10 Indian Cuisine

Characteristic Features

- North Indian cuisines usually have thick, moderately spicy and creamy gravies.
- Use of dried fruits and nuts is fairly common even in everyday foods.
- Dairy products like milk, cream, cottage cheese, ghee and yoghurt play an important role in the cooking of both savory and sweet dishes.
- This region is famous for tandoori roti and naans, stuffed parathas and kulchas.
- Basmati rice in the form of jeera rice and pulaos are common.
- Popular dishes are mutter paneer, chaat, dhokla, dhalmakhani, samosas and so on.

▲ Plate 7.11 Thali

2. South Indian Cuisine: South Indian cuisine includes the five southern states of India: Andhra Pradesh, Karnataka, Kerala, Tamilnadu and Telungana.

Characteristic Features

- Rice is a staple food in South Indian Cuisine.
- The cuisines have common ingredients and differ primarily in the spiciness of the food.
- Millets used commonly in rural areas are becoming popular in urban region too.
- Some authentic and popular South Indian dishes like pongal, sambar and vadai are from Tamilnadu, rava idli from Karnataka, kadalai curry and appam from Kerala and kebabs and biriyani from Andhra Pradesh.

▲ Plate 7.12 South Indian Cuisine

Ingredients used in North Indian Cuisine

Vegetable oil, mustard oil, spices, cheese, paneer, wheat products, black pepper, garam masala, fleshy foods, saffron.

Ingredients used in South Indian Cuisine

Rice, wheat, millets, coconut, ginger, garlic, pulses, greens, masala powders, ghee, vegetable oils, fruits and vegetables, spices.

Courses of Menu-South Indian

Rice with sambar

Rice with rasam

Curd with rice (served with poriyal / kootu, pickle)

Palpayasam

Betel leaf and nut

i. Tamil Nadu Cuisine

Characteristic Features

Variety of raw and parboiled rice as a staple food, forms part of a typical meal in Tamilnadu, accompanied with mildly or richly spiced vegetarian and non-vegetarian dishes.

- The various Tamil dishes can be categorized in different groups starting from the regular meals, the light meals, snacks and desserts.
- Mashed dhal with ghee, sambar, pulikuzhambu, rasam, kootu, kolisaaru, morkuzhambu and milagukuzhambu are the special dishes of Tamil Nadu.
- This cuisines conventionally include all the six tastes that any food categorized into sweet, sour, salt, pungent, bitter and astringent into the main meal so as to get complete nutrition and balanced digestion.

In Tamil Nadu there are different types of cuisines like Chettinad and Kongu. Some special foods like Thirunelveli halwa, Kumbakonam degree filter coffee, Ambur biriyani, Kanjeepuram idly, and Madurai Jigarthanda are also famous in Tamilnadu cuisine.

▲ Plate 7.13 Tamil Nadu Cuisine

For example Traditional meals served in Chettinad style on banana leaves follow a specific protocol. Each dish has a designated space and order in which, it has to be served.

DO YOU KNOW?

Nanjil Nadu is famous for its abundant use of coconut oil and coconut dishes made in Kanyakumari district.

Courses of Menu

Tamil Nadu

Items served at the top of the leaf

Salt, pickle, mormilagai, varuval, poriyal, kootu, lentil ball urundai, masiyal, banana.

Items served at bottom left

Appalam, fritters and fries.

Items served in the centre

Rice and ghee with mashed dhal, sambar, pulikuzhambu, morkuzhambu, rasam, curd.

Items served at bottom right

Sweet dishes like ukkarai, palpayasam.

DO YOU KNOW?

Athirasam is a traditional fermented sweet product and used in South Indian cuisine. A combination of rice and jaggery made into dough and fermented. Later fried in oil or ghee and the shelf life is long.

Serving of Food in Indian Cuisine

- Etiquette of Indian dining varies with the region in India.
- Both in urban and rural settings Indians wash their hands thoroughly prior to dining, and then eat with their fingers, without any cutlery.
- Traditionally Indians sit on the floor while eating.
- Main dish (rice or chappathi), surrounded with other dishes are served on 'Thali' – a plate laid with banana leaf or stitched leaf.
- There will be dishes that are crunch, soft, dry, moist, rough and smooth.
- Garnishes are very simple such as sprinkling chopped coriander leaves or grated carrots and nuts.
- After a meal, it is common to serve small cardamom seeds with their husks, aniseeds and betel nuts.

III. International Cuisine: International cuisine means the different cooking practices around the world. Each country has its own cuisine and each cuisine is an art in itself. A global cuisine that is practiced around the world and can be categorized according to the common use of major food stuffs. In order to become a global cuisine a local, regional and national cuisine must spread around the world.

There have been significant improvements and advances during the last century in food preservation, storage, shipping and production and today many countries, cities and regions have access to their traditional cuisines and many other global cuisine.

Some of the most popular International cuisines include French, Chinese, Italian and Mexican. Most countries have a well-known famous dish or ingredient that is associated with the cuisine.

Courses of Menu

In a full course menu, for example in a French cuisine, the dinner consists of multiple dishes or courses. In its simplest form, it consists of 3 or 4 courses such as appetizers, fish, entrée (main course) and dessert.

R7FFS9

1. French Cuisine

Characteristic Features

- Innovative flavours and elegant presentation.

▲ Plate 7.14 French Cuisine

- Rich flavours with garlic, herbs, duck and mushrooms.
- French cuisine is an unique cultural experience with nutritious foods with beauty.

Ingredients used in French Cuisine

Bread, butter, cheese, fleur de sel (sea salt), herbs, leeks, mustard, olive oil, shallots (onions), tarragon (fresh herb), wine.

French classical menu

Hors-d oeuvre / Appetizer

Potage / Soup

Poisson / Fish

Entrée / Entrée of 1st meat course

Sorbet / Dessert

Salades / Salad

Fromage / Cheese

Café / Coffee

Serving of Foods in French Cuisine

- Family style is followed in serving food with all courses on the table at the same line.

▲ Plate 7.15 French Salad

- Continuous service of bread is followed till the last course.
- "Buffet" style is the variation of the French service where all food is available at the correct temperature in a serving space other than dining table.

2. Chinese Cuisine

Characteristic Features

- Chinese cooking calls for maximum preparations of raw ingredients and minimum cooking methods.
- The dishes have balance, combination and blend of colour, flavour, texture, shape and size.
- The Chinese sauté, steam, deep-fry and roast with a difference.
- Ingredients are cut into beautiful shapes, yet flavor is never sacrificed.

▲ Plate 7.16 Chinese Vegetable Noodle

Ingredients used in Chinese Cuisine

Soya sauce, peanut oil, garlic, ginger, pepper, chilli sauce, corn flour, noodles, mono sodium glutamate (ajinomotto), bamboo shoots.

Serving of foods in Chinese Cuisine

- It is considered inappropriate to use knives on the dining table. Chopsticks are the main eating utensils.
- Youth should not sit at the table before the elders.
- When eating with a bowl, one should not hold it with its bottom part.
- Waiters serve hot dishes one by one and usually meat dishes are served first, then vegetables.
- Rice / noodles are the staple dishes for Chinese people.

▲ Plate 7.17 Noodle with Chop Sticks

Courses of Chinese Meal

Tea / Drink

Appetizer – Cold Dishes

Entrée – Meat & Vegetables

Rice / Noodles

Soup

Fruit

3. Italian Cuisine

Characteristic Features

- Italian food is extremely regional and varies greatly from region to region.
- Light sea food dishes, semolina and egg based pastas are served.
- Simple preparations and presentations. Heavy emphasis is given to quality of ingredients.

▲ Plate 7.18 Italian Cuisine-Pizza

Ingredients used in Italian Cuisine

Sea foods, high quality olive oil, pizza, sausages, egg based pastas, cream based sauces, sea salt, wine, expresso, fresh herbs.

DO YOU KNOW?

There are two varieties of vermicelli Italian and Asian. The Italian variety is made from flour, eggs and a little salt. Dough is formed and extruded through a device. Asian variety is similar but rice flour is used.

Serving of foods in Italian Cuisine

- In Italy, eating is a moment of celebration where families, friends, colleagues, get together, relax and participate in the dining ritual.
- Even the most informal meals include multiple courses.
- The various courses are a way to break down the meal into different sections, to add variety and creativity.

Courses of Italian Cuisine

Antipasto – Bowl of olives

Primo / Appetizer – Pasta rice / soup

Secondo / Main course – Chicken / sea food / meat

Controno – Plate of vegetables

Dolce – Bowl of fruit / cakes / custard

Coffee – Expresso

Pizza (in dinner course)

▲ Plate 7.19 Italian Cuisine-Pasta

IV. Fusion Cuisine

A combination of different traditional culinary cuisines is called fusion cuisine. Cuisines of this type are not categorized according to any one particular cuisine style and have played a part in innovations of many contemporary cuisines. **Eg:** Vegetable fried rice – Indo Chinese cuisine.

Key Words

1. **Cuisine** : French word – Kitchen
2. **Coquina** : Latin word – to cook
3. **Table d'hôte** : French word means – 'host table'
4. **Entrée** : Main course of a meal
5. **À la Carte** : French word "menu of the day"
6. **DuJour** : French word "Item served in a restaurant on a particular day"
7. **Naan** : Bread made in a clay tandoor oven.
8. **Stuffed Paratha** : Baked Indian bread with different kinds of vegetarian and non-vegetarian fillings
9. **Kulchas** : Bread made from fermented dough
10. **Mutter paneer** : Prepared with peas and paneer
11. **Chaat** : Savory snack in North India (**Eg:** Paanipoori)
12. **Dhokla** : Prepared from rice and split chick peas
13. **Dhal makhani** : Prepared from whole black gram, red kidney beans, butter and cream
14. **Etiquette** : Polite behaviour

LINKAGES

https://www.youtube.com/watch?v=Vw4lmFK7s2A-Types of Menu and Menu Design

https://www.youtube.com/watch?v=dDJca97viS4-Types of Menus

https://www.youtube.com/watch?v=ry1E1uzPSU0-What Does the World Eat for Breakfast?

https://youtube/_LTdWIFzr4 Food in French https://youtube/SjudnyMEWEg How to read an Italian menu

Student Activity

- Formulate a Table d'hôte (set) or À la Carte (selective) menu.
- Design a menu card for a small scale restaurant

Teacher Activity

- Take students to a nearby restaurant and make the students identify the type of menus and types of cuisines used.

R7J3G6

Questions

I. Choose the correct answer

1. The French word Table d'hôte means ……..
   a. Thali
   b. Entrée
   c. Host table
   d. DuJour
2. ……. is one of the variety of Table d'hôte menu.
   a. Buffet
   b. Ethnic
   c. À la Carte
   d. Lounge
3. 'Set menu' is otherwise called as ……..
   a. Cyclic
   b. Ethnic
   c. Table d'hôte
   d. DuJour
4. The French word used for 'selective menu' is ……
   a. Table d'hôte
   b. À la Carte
   c. Entrée
   d. DuJour
5. Specialty of the house' is the meaning of ……
   a. À la Carte
   b. Entrée
   c. DuJour
   d. Ethnic
6. Entrée is the …… in a menu.
   a. Appetizer
   b. Soup
   c. Main course
   d. Dessert

7. In a school canteen, which type of menu is used often?
   a. Buffet
   b. Banquets
   c. Cyclic
   d. Static

8. Which type of menu is followed in a coffee house?
   a. Set menu
   b. Selective menu
   c. DuJour
   d. Static

9. Buffet style is the variation of ..... food service.
   a. French c. Italian
   b. Chinese d. Indian

10. ..... is the main course in Indian menu.
   a. Pasta
   b. Noodles
   c. Cheese
   d. Rice and Chappathi

11. Pizza is the famous food in ..... Cuisine.
   a. French c. Italian
   b. Chinese d. Indian

12. Mono sodium glutamate is used in ..... cuisine.
   a. Italian c. Chinese
   b. Indian d. French

13. .....is a meal served in a large plate with other dishes in India.
   a. Chat c. Main course
   b. Thali d. Entrée

14. ..... is the staple food in China.
   a. Pasta
   b. Noodles
   c. Cheese
   d. Chappathi

15. ..... is a bread made in a clay Tandoor oven.
   a. Chappathi c. Noodles
   b. Pasta d, Naan

II. Write in 3 lines (3 marks)

1. Define a menu.
2. Define a cuisine.
3. List the qualifications of a person who plans the menu.
4. Point out the different types of menu?
5. What is a set menu?
6. Write on selective menu?
7. Give the meaning of Banquet?
8. How does a coffee house run?
9. What is a static menu?
10. DuJour menu – Explain.
11. Name some of the International cuisines.
12. Mention any 3 factors affecting a cuisine.
13. What is meant by course of menu (in general)?
14. List the common ingredients used in Italian cuisine.
15. Indicate any two characteristic features of Tamilnadu cuisine and name some of the dishes.

III. Write in a paragraph (5 Marks)

1. Bring out the difference between a Table d'hôte and À la Carte menu.
2. Plan a model menu for Table d'hôte in Indian style.
3. Write the characteristic features of Chinese cuisine.
4. How do you serve food in an Italian cuisine?
5. Describe the serving pattern of food in Chinese cuisine and write the course of meal?

IV. Answer in detail (10 marks)

1. Elaborate the factors to be considered in menu planning.
2. Discuss the various types of menu in detail.
3. How do you prepare a menu card for a restaurant? State the different steps in detail.
4. Explain the characteristic features of North Indian cuisine.
5. How food is served in an Indian cuisine?

Chapter 8 Food Microbiology

R7PBTH

Learning Objectives

- Understand the role of microorganisms in food.
- Know the conditions that lead to food spoilage.
- Understand the signs of spoilage foods.
- Learn the method of prevention of food poisoning.
- Be aware of importance of kitchen hygiene and safety.

Food that is consumed should be safe and wholesome. Food should be protected from contamination at all stages till it is consumed. A number of microorganisms are associated with different kinds of food and they are divided into three groups.

i Microorganisms that bring about useful changes in the preparation of certain foods.
ii Microorganisms that bring about spoilage of food and
iii Those that cause food poisoning and infections.

DO YOU KNOW?

Bacteria are in our body?
The human mouth is a home to more than 500 species of bacteria. Each square centimeter of your skin averages about 100,000 bacteria (https://microbeonline.com/amazing-world-of-microbes-some-unbelievable-facts-about-microorganisms/.).

8.1 Role of Microorganisms in Food

A number of microorganisms are involved in bringing about changes and are useful in the preparation of certain foods. Microorganisms that are useful to mankind are utilized in small scale in home and on a large scale in food industry. The important role of microorganisms in food are:-

1. ***Production of alcoholic beverages*:** Yeast is used in great deal in the preparation of alcoholic beverages

▲ Plate 8.1 Alcoholic Beverages

such as wine, beer, brandy, fermentation of milk.

2. ***Preparation of coffee seeds and cocoa:*** Coffee berries are allowed to ferment so that pulp can be removed easily. The pulp from cocoa seeds are also removed by fermentation process.
3. ***Preparation of malt beverages:*** The malt beverages are prepared by the infusion of grains that have been subjected to malting (sprouting). This is also known as brewing. The enzyme in the grain converts starch into sugar producing an extract 'Wort'. This extract can be treated with yeast to obtain the final product beer and its varieties.
4. ***Bread and Idli making:*** When yeast converts sugar into alcohol, carbon – di-oxide is formed which helps in the raising of dough in bread. In case of idli and dosa batter the yeast naturally present on the grains make the batter to raise.
5. ***Cucumber pickles:*** Fresh cucumbers are cleaned and packed in salt resistant bacteria like *Lactobacilli* that forms lactic acid which preserves cucumber. This is then packed in fluids containing salt, vinegar, sugar and different spices.
6. ***Vinegar:*** It is a solution containing acetic acid, obtained by further fermenting alcoholic liquids with the help of the microorganism *Acetobacter.*
7. ***Milk Products:*** Butter and cheese are the milk products where microorganisms are utilized.

i. ***Butter*** – It is composed of fat from milk with little casein and lactose. It can be separated from fresh milk or curd. The organism *Streptococcus lactis* is helpful in acid forming and *Leuconostoc citrovorum* is responsible for bringing flavour and aroma in butter. Due to the action of yeast, mould and bacteria the butter gets contaminated leading to a fishy taste and yeasty flavor.

2. ***Cheese*** – It is prepared by coagulation of casein present in milk. Hard cheese is prepared by removing much of the water e.g. Cheddar cheese, swiss cheese. The cheese is ripened by the microorganisms such as *Streptococcus lactis* and *Streptococcus cremoris*. Moulds such as *Pencilliumcamemberti*

▲ Plate 8.2 Fresh Breads

▲ Plate 8.3 Camembert Cheese

▲ Plate 8.4 Roquefort Cheese

and *Pencillium roquefort* gives Camembert and Roquefort cheese. Apart from these products curd, yoghurt, kumiss, leben and kefir are the fermented products obtained from the microbial action of milk.

8.2 Spoilage of Foods

8.2.1 Definition

Food spoilage is defined as decomposition and damage caused to food by various agents making it unfit for consumption.

R7SYHT

'Spoilt' is the term used for foods which look harmful and unfit to eat. Spoilt food has an unattractive colour, smell, taste and appearance.

The term 'contamination' means foods which are not fit to be eaten for sanitary reasons. The foods may look good, and taste and smell good, but may contain harmful chemicals, non –food matter and bacteria.

8.2.2 Causes of food spoilage

Foods may be contaminated by air, water, plant, soil, food handler, machinery and equipment, sewage and trucks or carts during transport. Foods get spoilt due to any one or more of the following reasons:

▲ Plate 8.5 Bruised Tomatoes

1. Physical – damage like cuts,bruises
2. Chemical – like the enzymes in the food
3. Biological–changes brought about by the microorganisms and their enzymes.

1. Physical: Physical spoilage is caused by improper temperature, compact stacking which leads to change in the structure of the food.

2. Chemical: The changes are brought about by enzymes present in food (intrinsic) or those produced by microorganisms (extrinsic) are of different kinds.

- Oxidising enzymes destroy vitamin C and produce deterioration in flavour.

- Proteolytic enzymes produce decomposition of proteins like meat,fish,eggs and milk.
- Amylolytic enzymes hydrolyse carbohydrates.
- Lipolytic enzymes produce a breakdown of fats into fatty acids and glycerol that are often oxidized to peroxides and aldehydes associated with rancidity or a bitter taste in fatty foods.

3. **Biological:** Biological factors that spoil food are the microorganisms like moulds, yeasts bacteria and their enzymes which settle in food at different stages. The changes brought about in the food are mainly in the form of fermentation, putrefaction and decay.

▲ Plate 8.6 Mould Growth in Bread

i. **Fermentation:** It is the anaerobic enzymatic conversion of carbohydrates into ethyl alcohol. It is caused by *Streptococcus* and *Micrococcus*.

ii. **Putrefaction:** It is the enzymatic decomposition of the proteins present in food with the production of foul smelling compounds such as hydrogen sulphide and ammonia. It is caused by *Pseudomonas* and *Proteus*.

8.2.3 Classification of foods by ease of spoilage

Foods can be categorized into three main groups on the basis of their shelf life or perishability.

1. **Stable or non-perishable foods:** Non-perishable foods include sugar, jaggery, hydrogenated fat, vegetable oil, ghee, whole grains, dhals, whole nuts and processed foods like dry salted fish / meat, papads, canned foods, jams and murabbas. These foods do not spoil unless they are handled carelessly.
2. **Semi Perishable Foods:** These foods include processed cereals, pulses and their products like flour, semolina, parched rice and popcorn. Shelf life of these products depends on the storage temperature and moisture in the air. Foods like potato, onion, nuts, frozen foods and certain canned foods can be stored for a week to a couple of months at room temperature without any undesirable changes of the products.
3. **Perishable Foods:** This includes foods such as dairy products, eggs, poultry,

▲ Plate 8.7 Spoiled Foods

meat, fish, fruits and vegetables. These foods get spoiled easily by natural enzymes.

8.2.4 Signs of Spoilage in Foods

The spoilage signs vary with the type of foods, causes of spoilage and environment.

Signs of spoilage: Spoilage generally seen are softening, hardening, discolouration, mould growth, fermentation, drying, oozing out of liquid, off odours such as mouldy, alcoholic or putrid and presence of insects.

The following gives the spoilage indicators in different categories of food:

1. ***Cereals and pulses:*** Although the foods do not spoil easily, the following signs could be noted if spoilt.
- Musty odour and off flavor.
- Presence of weevils, beetles, moths and worms.
- Clumping of whole grains.
- Presence of dirt, mud and stones.

▲ Plate 8.8 Spoiled Carrot

2. ***Vegetables and fruits:*** These show the following signs of spoilage:
- Presence of mould, leading to rot.
- Green leafy vegetables are wilted and limp.
- Discolouration and mushy texture.
- Presence of insects and worms.
- Green potatoes, sprouted potatoes and over mature vegetables.
- Skin or peel is damaged or bruised.

▲ Plate 8.9 Sprouted Potato

3. ***Milk and milk products:*** These products which get spoilt may show one or more of the following changes:
- Change in taste to sour or bitter.
- Milk, buttermilk or curds have a frothy, bubbly surface.
- Change in smell.
- Rope formation.

▲ Plate 8.10 Curdled Milk

- Discolouration.
- Fat separates out into clumps.
- Milk curdles when heated.
- Butter tastes rancid.
- Cheese and curd develop off odour and mould growth.

4. ***Meat and poultry:*** Spoilt meat shows the following signs
- Discolouration.
- Putrid smell.
- Slimy appearance and feel.

Organ meats such as liver, kidney and brain are more perishable than muscle meat due to the presence of fat.

5. ***Fish:*** Spoilt fish shows the following signs:
- Dull or sunken eyes.
- Gills are grey or green.
- Off odour.
- Flesh separates from bone and is flabby.
- Loose scales.
- Shellfish claws and tail lose their spring.

6. ***Eggs:*** Spoilt eggs will float when dropped in water. The signs of spoilt egg are:
- Cracked shell.
- Leaking contents.
- Exposed egg yolk.
- Eggs should be checked for blood spot, meat spot, foul odour or other contaminations.

DO YOU KNOW?

Do we get oxygen from microbes?
Yes. Microbes generate at least half the oxygen we breathe.

7. ***Cooked foods:*** Cooked foods must be consumed immediately and the left overs should be stored carefully. Cooked foods have high risk of getting spoilt.

8. ***Canned foods:*** Generally canned foods have longer shelf life and the chance of getting spoilage is possible when bacteria enters the can. Sometimes the acid from food reacts with the iron of the container and the canned foods get spoiled. The signs of spoilage in canned foods are:

▲ Plate 8.11 Sign of Leakage

- Puffy, swollen appearance of cans.
- Leaky, corroded or rusty cans.
- Contents spurt out when the can is opened.
- Contents smell putrid.
- Brine or syrup looks cloudy, bubbly, slimy or mouldy.
- Contents are discoloured.

▲ Plate 8.12 Sign of Spoilage in Canned Foods

In case any one or more signs are noted it should be discarded without tasting the contents.

9. *Frozen foods:*

It is very difficult to identify the spoilage in frozen foods unless there is change in colour or smell. If following precautions are taken, food borne illness can be prevented.

- Do not use frozen foods if there is off smell, taste or discolouration.
- Do not re-freeze food which has been thawed.
- Thaw only required amount.
- Do not purchase damaged packages.
- Do not keep frozen foods out of the freezer for long before cooking.
- Do not accept food which has a large quantity of ice crystals formed inside the packet.

Food that is decayed is easier to recognize than spoilt by microorganisms. Always the spoilt foods should be discarded and should not be consumed so as to prevent food poisoning and infections.

8.3 Food Poisoning and Prevention

Food poisoning is caused by the ingestion of food or drink, contaminated with bacteria or toxins. The term 'food borne disease' is defined as a disease usually either infectious or toxic in nature, caused by agents that enter the body through the ingestion of food.

Types of Food Poisoning

Food poisoning may be of two types

a. Non- bacterial: Caused by chemicals such as arsenic, certain plant and sea foods. Lathyrism and endemic ascitis are some diseases caused due to toxins in foods. In recent years there has been a growing concern about contamination of food by chemicals (eg) fertilizers and pesticides.
b. Bacterial: Caused by the ingestion of food contaminated by living bacteria or other toxins.

DO YOU KNOW?

More than 200 diseases are spread through food

Millions of people fall ill every year and many die as a result of eating unsafe food. Diarrhoeal diseases alone kill an estimated 1.5 million children annually, and most of these illnesses are attributed to contaminated food or drinking water. Proper food preparation can prevent most food borne diseases.

Bacterial Food Poisoning

Certain bacteria present in food produce toxins that are injurious to health. The four types of food poisoning are:

1. *Salmonella food poisoning*
2. *Staphylococcal poisoning*
3. *Botulism*
4. *Clostridium perfringens food poisoning*

Table 8.1 shows the major food poisoning of bacterial origin.

Table 8.1 Major Food Poisoning of Bacterial Origin

Details	Salmonellosis	Staphylococcal poisoning	Botulism	Clostridium perfringens poisoning
Bacteria	Salmonella	*Staphylococcus aureus*	*Clostridium botulinum*	*Clostridium perfringens*
Incubation period	6-48 hours	1-6 hours	12-36 hours	8-22 hours
Duration of illness	2-3 days	1-2 days	Several days to a year	One day
Symptoms	Headache, abdominal pain.  ▲ Plate 8.13 Symptoms	Abdominal pain, nausea, vomiting, diarrhoea.	Fatigue, headache, dizziness, visual disturbances, inability to swallow.	Abdominal pain, diarrhoea  ▲ Plate 8.14 Signs of Food Poisoning
Foods affected	Meat, meat products, poultry, salads,egg custards and other protein foods.	Improperly prepared custards, cream filled pastries,dairy products, meat poultry, salads.	Improperly processed canned foods, mushrooms, tuna, figs.	Boiled,steamed, braised, stewed meat.
Prevention	* Strict personal hygiene * Avoidance of fecal contamination from unclean food handlers. * Unsafe practices.	* Cleanliness and sanitary habits. * Proper heating and refrigeration. * Exclusion of infected food handlers.	* Pressure cooking food at high temperatures in canning. * Boiling and stirring home canned food for 20 minutes.	* Careful time and temperature control. * Quick chilling of cooked meat dishes. * Isolation of raw and cooked foods.

8.4 Hygiene and Safety in Food Service

In order to prevent food spoilage in food service following need to be taken care of.

8.4.1 Safe Guarding of Food

Lack of proper attention to handling of food and negligence of personal hygiene lead to food poisoning and require serious attention. The incidence of food borne disease can be considerably reduced by certain healthy practices.

- Cook at high temperature to ensure that all bacteria are killed.
- Keep all perishable foods in a cool place or in refrigerator.
- Cover food to protect from dust, flies and other modes of infection.
- Avoid consuming moldy and foul smelling foods.
- Avoid damaged and bulging tin/ canned foods.
- Wash the foods carefully to ensure the removal of insecticide, worm, eggs, and other parasites sticking to it.
- Keep the utensils free from contamination.
- Ensure food handlers are healthy and free from disease.
- Avoid taking food with dirty fingers.
- Avoid tasting food while cooking.
- Maintain the three 'E's of safety – Engineering, Education and Enforcement.

Food hygiene and sanitation is highly important in food service operations especially in larger scale as they might affect public health. Quality control, microbial safety and good personal hygiene are essential to keep food safe.

8.4.2 Kitchen Hygiene

Hygiene in the kitchen is very important for the general cleanliness of the environment and the people working there as it requires handling of food materials.

▲ Plate 8.15 Hygienic Handling of Food

Table 8.2 Kitchen Hygiene and Sanitation

Environmental Hygiene	Hygienic Food Handling	Personnel Hygiene
Site	Receiving	Neatly Pressed Dress
Structure	Storage	Grooming
Equipment furniture/fittings	Preparation	Health
Ventilation	Cooking	Habits
Lighting	Holding	
Water supply	Serving	
Waste disposal	Cleaning	
	Disposal	

(i) Environmental Hygienic: The place where food is delivered, prepared and served.

Site should be free from air pollution and insects, water supply and sewage disposal should be taken care of. In structure, cleanliness of walls, floors, ceilings or any surface should be free from any hazards of infections.

Equipment like furniture and fittings need most attention to make it dust and dirt free. Thorough cleaning is required to avoid chemical residues that may contaminate food.

Need for proper ventilation is required in all areas of the kitchen. All kitchen should be provided with exhaust fans and extraction hoods above cooking range to remove impurities.

Kitchen should be well lighted to detect dirt, grease and infestation easily.

Water supply should be treated to ensure that it is fit for cooking and drinking and washing utensils.

Kitchen waste like peelings, trimmings, plate waste, spillage, empty cans and bottles must be disposed immediately from the kitchen, never be allowed to remain anywhere near the production, storage or service area. All these become contamination of food.

▲ Plate 8.16 Well Lighted Kitchen

(ii) Hygienic Food Handling: In receiving food materials quality of food received will go a long way. Check for microorganisms, accidental chemicals and pesticides.

In storage proper methods should be followed.

1. Temperature prevailing in storages.
2. Humidity in the storage environment.
3. Presence or absence of any type of infection.

▲ Plate 8.17 Hygienic Food Service

Handling food at the stage of preparation is very important from hygienic point as in receiving and storing. Food should be cooked as quickly as possible after the preparation, unless frozen for later use. In food service establishment food should be held for some time before service. The holding temperature for food, within the danger zone is 10^0C to 62^0C. In service food care is necessary to see all serving equipment is clean and server is not

in any way contaminating the food. Tables must be clean. Clearing up is a vital part as far as hygiene is concerned. Otherwise it may spread infection quickly. All wastes should be emptied in pedal bins. Disposal should be emptied into the garbage bins. Waste food should not be transported open to safeguard the health of people.

(iii) Personnel Hygiene: It refers to the general health, personal grooming and working habits of all personnel.

In dress – Grooming – Health and Habits-following points should be adhered.

1. Wash hands, cut nails, short hair trimmed.
2. Clean shaved,
3. Do not touch food when suffering from cold, fever, diarrohea, cholera, jaundice and wound if any
4. Avoid licking fingers.
5. Clean working area regularly.
7. Keep all food covered.
8. Have bath daily.
9. Brush teeth twice a day.

▲ Plate 8.18 Personnel Hygiene

10. Cover wounds properly.
11. Wear well-polished shoes.
12. Handle food correctly.
13. Leaning or sitting on the work table is an objectionable habit.
14. Resist from smoking.
15. Avoid chewing pans / chewing gums / betel leaves.

Safety: Safety implies the concern for providing conditions at work, which will protect people from infection, injury and theft. It also includes protection of premises, equipment and other resources from infestation, damage and destruction. Safety measures to be adhered in food service operation for a healthy environment are:

1. Wear clean cotton clothes and head cap.
2. Switch off the gas first from the knob on the cylinder and then switch off the knob of the gas stove.
3. In case of fire close the main connection / gas cylinder knob.
4. Do not place any newspapers, poly bags next to the lighted gas.
5. Keep the knives in a tray and then carry.
6. Do not leave any utensil unattended on the gas stove.
7. Add sufficient water in pressure cooker, follow instructions carefully.
8. While frying hold the skillet firmly with tongs. Gently slide the food in hot oil.
9. Keep floors dry immediately wipe any spills on the floor.
10. Cool the food before grinding in the mixer / grinder.
11. Keep fire extinguishers in the lab at strategic points.

Key Words

1. **Alcoholic Beverages** : Drinks that contain alcohol (ethanol),
2. **Canning** : Method of preservation of foodstuffs, in which suitably prepared foods are placed in metal containers that are heated, exhausted, and hermatically sealed.
3. **Coagulation** : It is a process that converts or thickens a liquid into solid and semi-solid.
4. **Contamination** : The substance or a food contaminated by radioactive substance or chemicals, or through air, water.
5. **Decomposition** : The food is spoiled by microorganisms such as bacteria, molds, and yeasts, along with natural decay of the food.
6. **Diarrhoea** : A common symptom of gastrointestinal disease, characterized by increased frequency and fluid consistency of stools.
7. **Endemic ascitis** : Ascites is a gastroenterological term for accumulation of fluid in the peritoneal cavity.
8. **Food handler** : A person who directly engages in the handling of foods.
9. **Food infection** : The food contains bacteria or other microbes which infect the body after it is eaten.
10. **Food Intoxication** : Disease resulting from the ingestion of toxins, produced by microorganisms that have been grown in a food.
11. **Food Poisoning** : A general term applied to all stomach or intestinal disorders due to food contaminated with certain microorganisms, their toxins chemicals, or poisonous plant materials.
12. **Lathyrism** : It is a neurological disease of humans and domestic animals caused by eating certain legumes of the genus of Lathyrus.
13. **Putrefaction** : The decomposition of proteins by microorganisms producing disagreeable odors.
14. **Rancidity** : Undesirable changes like unpleasant smell or taste due to changes in fat.
15. **Souring** : Exposure to an acid to affect a physical and chemical change in food.
16. **Thawing** : It is a process of warming foods that has been frozen.
17. **Putrid** : Decomposed and foul- smell coming from non-vegetarian foods like meats
18. **Toxin** : Poisonous substance, such as a bacterial toxin, elaborated by an organism.
19. **Kumiss** : Fermented mare's milk
20. **Kefir and Liben** : Fermented sheep's milk
21. **FCI** : Food Corporation of India

LINKAGES

https://https://www.youtube.com/watch?v=BlKP35bct2o - Microorganism in food

https://www.youtube.com/watch?v=tUi4wgQVQ-I-- Microorganism in food

Student Activity

- Preparation of chart on causes of food spoilage and identifying common spoilages in food at home.

Teacher Activity

- Experimentation and observe the changes in spoilage of five common foods such as bread, milk, tomato, orange and cooked egg.
- Observe the food quality control measures followed in Food Service Institutions.

Questions

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I. Choose the Correct answer

1. The physical change seen in deep frozen foods is .....
   a. Refrigerator burn
   b. Refrigerator blanch
   c. Freezer burn
   d. Freezer blanch

2. Salmonellosis affects the .....
   a. Central nervous system
   b. Gastro intestinal system
   c. Circulatory system
   d. Reproductive system

3. Ice is responsible for causing food borne illnesses when .....
   a. Prepared from un potable water
   b. Melts in the beverage
   c. Contaminated by flies, dust and dirty sawdust
   d. All the above.

4. The illness caused commonly by consuming spoiled canned foods is .....
   a. Diphtheria
   b. Asthma
   c. Botulism
   d. Mumps.

5. The non-bacterial food poisoning is ……
   a. Botulism
   b. Salmonelosis
   c. Shigellosis
   d. Staphylococcal

6. Foods considered unfit for use should be ……
   a. Fed to domestic animals
   b. Cooked well to destroy germs
   c. Frozen immediately to prevent further spoilage
   d. Discard at once

7. The main symptoms of staphylococcus food poisoning is …….
   a. Vomiting
   b. Diarrhoea
   c. Fever
   d. Abdominal pain

8. The common spoilage in bakery products is brought about by …….
   a. Bacteria
   b. Virus
   c. Molds
   d. Fungi

9. Rope formation in milk is …….
   a. Spoilage
   b. Poisoning
   c. Fermentation
   d. Decay

10. Enzymes producing decomposition of proteins in foods like meat, fish, eggs and milk are ……..in nature.
   a. Proteolytic
   b. Amylolytic
   c. Lipolytic
   d. All the above

11. One of the food involved in staphylococcus food poisoning is…..…..
   a. Potato
   b. Fish
   c. Bread
   d. Milk

12. Milk products can be kept for considerably long time by ……
   a. Heating
   b. Boiling
   c. Pasterurization
   d. Refrigeration

13. Foul smelling in protein foods is due to production of ……
   a. Hydrogen sulphide
   b. Aldehyde
   c. Alcohol
   d. Rope

14. Extraction hoods above cooking range removes ……
   a. Impurities
   b. Flavor
   c. Nutrients
   d. Darkness

15. Foods that spoil readily are known as ……..
   a. Semi-perishable foods
   b. Non perishable foods
   c. Perishable foods
   d. Grains

II. Write in 3 lines (3 marks)

1. How do you classify microorganisms in food?
2. Define contamination.
3. Give three causes of food spoilage
4. Write down the changes brought by enzymes present in food
5. What is putrefaction?
6. What is fermentation?
7. How do you classify food by the ease of spoilage?
8. List the signs noted in spoilt vegetables and fruits.
9. List the signs noted in spoilt Milk and milk products.
10. List the signs noted in spoilt Meat, poultry and egg.
11. What are the signs noted in spoilt fishes?
12. List any three points for the safety in food service operation?
13. Give the precautions to be taken to prevent food –borne illness due to spoilage of frozen foods.
14. Indicate the aspects to be noted in personnel hygiene.
15. Give the symptoms of Salmonellosis.
16. State the meaning of safety.

III. Write in a paragraph (5 marks)

1. Give the symptoms of botulism and outline simple measures to prevent its occurrence in food service.
2. Write a note Salmonellosis.
3. Discuss the about staphylococcal poisoning.
4. Explain the Clostridium perfringens poisoning.
5. Brief on various causes of food spoilage.
6. Write on personal hygiene
7. Give the spoilage indicators of perishable foods noted in food service establishments.
8. Give the measures of safeguarding food in a food service outlet.

IV. Answer in detail (10 marks)

1. Describe the important role of microorganisms in food.
2. Define Food spoilage. Write on causes of food spoilage and classification of food by ease spoilage.
3. How will you maintain the kitchen hygiene?
4. Elaborate on safety measures to be followed in food service operations
5. Differentiate the major food poisoning on bacterial origin.

Chapter 9 Attitude and Personality Requirements

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Learning Objectives

- Gain knowledge about the attributes of a food service personnel.
- Obtain the skill of grooming oneself into professional food and beverage personnel.
- Understand the competencies of a food service professional.

The ancient Tamil scripture, Tirukural, says,

"The whole purpose of earning wealth and maintaining a home is to provide hospitality to guests.

As the above verse talks about the importance of hospitality, it can be seen how important it is to be a hospitable person in the food service industry. A positive attitude is important for any person doing work in a food service. Hospitality sector comes under the service industry and hence customer satisfaction is important to run a successful food service.The food service personnel are those who come in direct contact with the customers and their attitude and personality are of utmost importance.

Personality is a way of expressing ourselves in a better way to others. It is the self-developed quality within us which shows our inner character. Having a good pleasing personality will give confidence to face the customers and it helps to create a good rapport with them.

9.1 Office and Administration

A commercial food service has a front office and back office sections.

Front office is one of the many departments of the hotel business which directly interacts with the customers when they first arrive at the hotel. The staff of this department are very visible to the guests.

The staff receives the guests, handles their requests, and strikes the first impression about the hotel into their minds. Front line workers become more important in providing customer satisfaction

▲ Plate 9.1 Front Office

▲ Plate 9.3 Attitude

▲ Plate 9.2 Back Office

DO YOU KNOW?

Tips for negative body language

- Checking the time
- Looking at the ground
- Touching face
- Picking at something. Like clothes, notebooks, or fingernails,!

because they are the ones who represent the organization or departments.

The back office is the portion of a food service made up of administration and support personnel who are not facing the customers. In a non-commercial food service also, a pleasant attitude is needed for all those who prepare and serve food.

9.2 Attitude of Food Service Personnel

Attitude is everything. Without a right attitude the food service industry cannot function properly. A positive attitude must remain steady, in good and bad times. The attitudes needed to work in a food service are:

- Punctuality
- Local Knowledge
- Attitude to customers
- Memory
- Honesty
- Loyalty
- Conduct
- Sales ability
- Sense of urgency
- Handling complaints
- Pride in work
- Body language

1. Punctuality: Punctuality is an important quality which should be possessed by food service personnel. If staff are late for duty it shows a lack of interest in their work and a lack of respect for the management and customers. Use time wisely.

DO YOU KNOW?

Tips for positive body language

- Leaning in slightly when someone is speaking demonstrates that you are actively listening.
- Practice hanging your arms comfortably at your side.The handshake is one of the most important nonverbal communication cues.
- A firm handshake will give you instant credibility while a weak handshake will make you appear fragile
- Good eye contact lets others know that you are interested in the conversation.

If the staff are not punctual with the work it will affect the costing time and profits. Punctuality will bring in more customers and will generate revenue.

2. Local Knowledge: In order to have human relation with customers, the staff shoulld have knowledge on different languages, locality the various types of food offered, the best means of transport, places of interest and so on to faclitate the customers.

3. Attitude towards customers: A correct approach to the customers is essential. The staff must provide service and should be able to judge the customer's needs and wishes. A careful observation should be kept on customers during the service (but without staring) to check the progress of the meal. Always be excited and passionate about the service.

4. Memory: A good memory is an asset to food and beverage service staff. It will help them in various ways in their work. For example if they know the likes and dislikes of the customers, where they like to sit in the food service area, what are their favouritefood and so on so that the customers get welcomed and taken care of.

5. Honesty: Trust and respect of staff, customers and management relationships leads to an atmosphere at work that encourages efficiency and a good team spirit among the food and beverage service operations.

6. Loyalty: The staff loyalty is of primary importance to the establishment in which they are employed and its management. The customers will trust the food service establishment where the staffs are loyal in what they do. This also helps in building customer loyalty in the food service sector.

7. Conduct: The staff should conduct themselves in high standards at all times, especially in front of customers. The rules and regulations of an establishment must be followed. Respect must be shown to all senior members of staff.

DO YOU KNOW?

Vanakkam is Namaste in yoga

Vanakkam is usually spoken with a slight bow and hands pressed together, palms touching and fingers pointing upwards, thumbs close to the chest. This gesture is called AñjaliMudrā or Pranamasana.

8. Sales Ability: All the members of staff reflect the image of the establishment and therefore, it is a must to have a complete knowledge of all forms of food offered in

the establishment, their correct price and service. Hence, each and every member will be able to contribute to personal selling and merchandising.

9. Sense of Urgency: Staff must develop a sense of urgency in their work so as to enable quick and speedy service and attention to the customers. They should be able to handle stress and motivate each other in times of emergencies.

10. Handling Complaints: All the staff should have a pleasant mannerism and show courtesy at all times. An even temper and good humor is expected in each and every member as they go about doing every job that is expected. They should never show their displeasure even during a difficult situation. Staff should never argue with a customer and if they are unable to resolve a situation, it should be referred immediately to a senior member of the team who will be able to reassure the customer and put right any fault.

11. Pride in Work: The workers working in food service establishment should have pride in their work. They must feel proud of the work they do. Since the work of the food service personnel is to make customers happy by making and serving good food, they should do everything in a very systematic way to avoid any errors.

12. Body Language: Personnel working in food service should possess great body language. Open body language will make the customers feel much warmer and invited. The smile is a universal signal.

9.3 Personal grooming

Personal grooming (also called preening) is the art of cleaning, grooming, and maintaining parts of the body. In food service, personal grooming is essential to maintain hygiene.

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Grooming in Food and Beverage Department:

Table 9.1 Grooming

Criteria	Gentlemen	Ladies
		
	▲ Plate 9.4 Grooming	
Hair	• Hair should be combed back, short, well-trimmed and should not cover the forehead. It should not be grown below the nape of the neck.	• Hair should be combed back, well-trimmed and should not cover the forehead. • Hair should be made into a bun and covered with a net.

Table 9.1 Grooming (Continued)		
Criteria	**Gentlemen**	**Ladies**
	• Natural color of hair to be maintained and not be excessively gelled or frizzy.	• Hair length should be upto the nape of the neck could be made into a pony tail. • Hair should not fall below the nape of the neck. • Natural colour of hair to be maintained and not be excessively gelled or frizzy.
Face	• Moustache should be well trimmed. • Should be clean shaven on duty.	• Heavy or brightly colored make up to be avoided.
Breath	• Breath must be fresh (no smell of foodstuff, cigarette smoke or alcohol).	• Breath must be fresh (no smell of foodstuff, tobacco or betel nuts).
Nails	• Hand and toe nails be clean and well trimmed. No colour is permitted.	• Hand and toe nails be clean and well trimmed. If nails are long they should be shaped. • Nail polish is not permitted.
Body odour	• Ensure that deodorants and/or anti perspirants are used daily to ensure that no body odour is present.	• Ensure that deodorants and /or antiperspirants are used daily to ensure that no body odour is present.
Footwear	• Clean Black socks and shoes to be worn daily.	• Black shoes with a small heel to be worn. Pencil or high heels are not permitted.
Jewellery	• Jewellery like chains, bracelets must be avoided. • Heavy watches must be avoided.	• Jewellery must be limited to a minimum. No large or hanging or noisy jewellery to be worn. • Minimal simple jewellery can be worn • Metal watches of reasonable size with leather or metal strap should be avoided.

9.4 Food and Beverage Personnel

A person working in the food service industry must recognize the roles and duties because it helps to achieve the goals and aims of the establishment. The goals of most of the establishments are to satisfy customer needs and make profit.

1. Knowledge of food and beverage and technical ability of personnel: The staff must have sufficient knowledge of all the items on the menu in order to advise and offer suggestions to customers. In addition, they must know how to serve correctly each dish on the menu, what its accompaniments are, the correct cover, and the make-up of the dish and its garnish.

2. Healthy working relations: Healthy working relations build up over time, and depend largely on faith and trust between managers and employees.

Employees should be able to communicate their thoughts, feelings and ideas to managers without fear. Healthy relations develop only in an environment of give and take, and where ideas are generated. Organizations therefore need to redevelop this unity in their internal group culture in order to maximize outputs.

3. Customer-oriented: The views and demands of customers affect their choices and have a tremendous influence on the food service organizations. No matter how tasty the menu, customers would not come back if they have bad experiences with customer service. To determine customer wants and needs, a keen interest must be shown by the food service personnel. Added services intended to increase satisfaction eventually to ensure customer satisfaction. This phenomenon encourages the philosophies of continuous quality improvement and total quality management.

4. Manager: A catering manager takes care of all food and beverages at a facility's event. It includes assisting with the menu, scheduling the staff, and meeting the customer's needs. Food service managers are the leaders in the kitchen and the front of house in restaurants. They are responsible for overall operation of the restaurant.

Food service managers lead their team to make sure the food looks good and is cooked properly, the proportions are correct, and it is cooked and served quickly by friendly and courteous staff and meets health standards. The manager should also have good communication skills, enthusiasm, empathy, competence, ability to delegate tasks, cool under pressure, team-building skills, problem solving skills, hardy attitude and vision.

▲ Figure 9.1 Qualities of a Catering Manager

▲ Plate 9.5 Manager with Food Service Personnel

5. Waiters: Waiters work with the customer needs.Waiters must have good knowledge of food and beverage and its appropriate service.They ensure that all guests are served in appropriate manner and also display highest standards of hospitality. Their main duty is to take orders, serve (where applicable, prepares) food and beverages to guests as per the hotels standards in a friendly,

timely and efficient manner. Their role in performing the food service organizations is extremely essential for successful functioning.

▲ Plate 9.6 Waitress Service

6. Chefs and cooks: Attitudes are more essential than skills as a good attitude will help him not only learn skills but also persevere and overcome the many difficulties he will face. Some of the professional attitudes needed for the chef are optimistic approach toward the job, determination, capability to work with people enthusiasm

▲ Plate 9.7 Chef and Cooks

▲ Plate 9.8 Chefs in Work Station

to learn, know how, commitment quality, good perceptive of the basics, willing to work late hours, team spirit, obedience and interest to learn new things.

The cooks set up workstations with all needed ingredients and cooking equipment. They prepare ingredients for use in cooking (chopping, peeling, cutting). They should have a knowledge of various cooking methods. A cook should check the food while cooking and ensure great presentation by dressing them before they are served. Monitoring the stock and placing the orders when there are shortages is also the duty of a cook.

The hospitality industry looks for people with good communication skills, positive attitude and managerial skills are essential qualities and therefore a person aspiring in this sector has to be one who imbibes these qualities so that they reach great heights in their career prospects.

Key Words

Hospitality : The act of kindness in welcoming and looking after the basic needs of guests mainly in relation to food, drink and accommodation.

Beverage : A drink other than water.

Banquet : An elaborate and formal evening meal for many people.

Courtesy : The showing of politeness in one's attitude and behaviour towards others.

Chef : A professional cook, typically a chief cook in a restaurant.

LINKAGES

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https://www.4hoteliers.com/features/article/4580 - Understanding body language – Lesson for hospitality managers

https://www.youtube.com/watch?v=pwmhl6rzvpm-Learn how to manage people and be a better leader

https://www.youtube.com/watch?v=7e-cwdnsiow--a.p.j.abdul kalam inspirational lessons for life time- how to manage failure and success

https://www.youtube.com/watch?v=l_-obnk12-4---Talking about your personality-Ambivert/ Extravert / Introvert

https://www.youtube.com/watch?v=njmfnto3qga - Top 10 hotel management tips for mamnagersin the hospitality industry

https://mail.google.com/mail/u/0/#inbox/1617fa60afe4444e?projector=1--Element of competency

https://www.youtu-Improve communication skill show to overcome shyness with strangers? Public speaking & personality development video.

Student Activity

Interview food service personnel and report their attitudes. Or visit a restaurant, observe and report the grooming of food service personnel

Teacher Activity

Arrange a visit to a food service industry.

Questions

I. Choose the correct answer:

1. …….. is important to run a successful food service.
   a. Customer satisfaction
   b. Good kitchen
   c. Proper cooks
   d. Ambience

2. ……. is an important quality which should be possessed by food service personnel.
   a. Meekness
   b. Punctuality
   c. Carelessness
   d. Accuracy

3. …….. is one of the many departments of the hotel business which directly interacts with the customers when they first arrive at the hotel.
   a. Back office
   b. Kitchen
   c. Storage area
   d. Front office

4. The……. is a universal signal.
   a. Frown
   b. Whistle
   c. Smile
   d. Handshake

5. ……. is the art of cleaning, grooming, and maintaining parts of the body.
   a. Mopping
   b. Personal grooming
   c. Manicuring
   d. Jogging

6. A ……. takes care of all food and beverages at a facility's event.
   a. Catering manager
   b. Chef
   c. Cook
   d. Bus boy

R8BQL4

7. …….. must have good knowledge of food and beverage and its appropriate service.
   a. Cooks
   b. Chefs
   c. Waiters
   d. Managers

8. A professional cook, typically a cheif cook in a restaurant is a …….
   a. Managers
   b. Bell Boy
   c. Chef
   d. Waiters

9. The …….. set up workstations with all needed ingredients and cooking equipment.
   a. Cooks
   b. Managers
   c. Chefs
   d. Waiters

10. A …….. is an asset to food and beverage service staff.
    a. Resourcefulness
    b. Good memory
    c. Smile
    d. Good posture

II. Write in 3 lines (3 marks)

1. What are the office sections in commercial food service?
2. Why is attitude of food service personnel important?
3. Write a note on personal grooming.
4. How can waiters satisfy the needs of the customers?
5. Enumerate the work done by chefs.
6. Point out the duties of a cook.
7. Indicate the points to be kept in mind to make the food service industry customer-oriented.
8. Note down the method of developing healthy working relations in a food and beverage industry.
9. Identify the reasons for the failure of a food service industry.
10. If a customer is rude to the waiter what should he/she do?

III. Write in a paragraph (5 Marks)

1. Tabulate on grooming in food and beverage department.
2. As a catering manager how will you plan a birthday party in your restaurant?
3. When a customer walks in how should the waiter take care of him/her?
4. How should you groom yourself to become presentable as a chef?

IV. Answer in detail (10 marks)

1. Give a detailed account on the attitude of a food service personnel.
2. How can you make your restaurant customer-oriented?
3. Write a note on catering manager in a restaurant. How do you think the manager can help in developing healthy relations among the workers under him?
4. As a chef plan a menu for a wedding banquet. Explain how you will execute it?

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HIGHER SECONDARY FIRST YEAR

VOCATIONAL EDUCATION

FOOD SERVICE MANAGEMENT

PRACTICAL

Chapter 1 Food Service Operation

1.1 Rating of Star Hotels

Aim: To gain knowledge about hotel rating.

Introduction

Hotel ratings are often used to classify hotels according to their quality. From the initial purpose of informing travelers on basic facilities that can be expected, the objectives of hotel rating has expanded into a focus on the hotel experience as a whole. Today the terms 'grading', 'rating', and 'classification' are used to generally refer to the same concept, that is to categorize hotels.

Food services, entertainment, view, room variations such as size and additional amenities, spas and fitness centers, ease of access and location may be considered in establishing a standard. Hotels are independently assessed in traditional systems and rest heavily on the facilities provided. Some consider this disadvantageous to smaller hotels whose quality of accommodation could fall into one class but the lack of an item such as an elevator would prevent it from reaching a higher categorization.

Procedure: Discuss in class and find out about star rating status for hotels. Tabulate your results.

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Hotel Star ★ Criteria

Result:

1.2 Observation of a Hotel

Aim: To obtain the skill of rating a hotel by visit/computer based approach

Tools: Questionnaire

Procedure: Fill in the questionnaire and Grade the hotel.

Name of the Hotel:

Address:

One star

Do 100% of the rooms with shower/WC or bath tub/WC?	Yes/No
Is daily room cleaning done?	Yes/No
Do 100% of the rooms have colour-TV with remote control?	Yes/No
Does the room have table and chair?	Yes/No
Are soaps or body wash provided?	Yes/No
Is there Reception service?	Yes/No
Is there a publicly available telephone for guests?	Yes/No
Will extended breakfast be provided?	Yes/No
Is beverage offered in the hotel?	Yes/No
Is there a deposit possibility?	Yes/No

Two Star

Is there a breakfast buffet?	Yes/No
Is there a reading light next to the bed?	Yes/No
Is there bath essence or shower gel?	Yes/No
Are there bath towels?	Yes/No
Are there linen shelves?	Yes/No
Is there any offer of sanitary products (e.g. toothbrush, paste, shaving kit)?	Yes/No
Are credit cards accepted?	Yes/No

Three Star

Is the reception opened 14 hours, accessible by phone 24 hours from inside and outside, bilingual staff (e.g. Tamil/English)?	Yes/No
Is there a three piece suite at the reception, luggage service?	Yes/No
Is there beverage offer in the room?	Yes/No
Is there telephone in the room?	Yes/No
Is there internet access in the room or in the public area?	Yes/No

Are there facilities like heating facility in the bathroom, hair-dryer, cleansing tissue? Yes/No
Is there a dressing mirror and place to put the luggage? Yes/No
Does it have sewing kit, shoe polish utensils, laundry and ironing service? Yes/No
Are additional pillow and additional blanket provided on demand? Yes/No
Is there a systematic complaint management system? Yes/No

Four Star

Is the reception opened 18 hours, accessible by phone 24 hours from inside and outside? Yes/No
Is the property centralized air conditioned? Yes/No
Is the lobby with seats and beverage service? Yes/No
Is there breakfast buffet or breakfast menu card via room service? Yes/No
Is there a mini bar or 24 hours beverages via room service? Yes/No
Is there upholstered chair/couch with side table? Yes/No
Is there bath robe and slippers on demand? Yes/No
Are cosmetic products (e.g. shower cap, nail file, cotton swabs), vanity mirror, tray of a large scale in the bathroom? Yes/No
Is there internet access and internet terminal? Yes/No
Is there a "À la carte"-restaurant? Yes/No

Five Star

Is the reception opened 24 hours with multilingual staff? Yes/No
Is the property centralized air conditioned? Yes/No
Is there doorman-service or valet parking? Yes/No
Is the reception spacious with several seats and beverage service? Yes/No
Is there personalized greeting for each guest with fresh flowers or Flower present in the room? Yes/No
Is there a minibar and food and beverage offer via room service during 24 hours? Yes/No
Are there personal care products in flacons? Yes/No
Is there internet-PC in the room? Yes/No
Is there a safety locker in the room? Yes/No
Are services like ironing (return within 1 hour) and shoe polishing provided? Yes/No
Is there turndown service in the evening? Yes/No

A visit / computer based approach any star category hotel.

Report:

Prepare a report groupwise

Chapter 2 Basics of Food

2.1 Assessing Student's Daily Diet

Aim: To assess the student's daily diet using 'Basic Food Group'.

Importance of basic four food groups

Foods have been classified based on the nutritive value. This helps in planning meals.

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Table 2.1 Importance of Basic Four Food Groups

S. No.	Food Groups	Main Nutrients	Dietary guidelines (or) Tips
1	**Cereals, millets and pulses:** Rice, wheat, bajra, maize, ragi, jowar, barley, rice flakes, wheat flour, malted cereals, Bengal gram, black gram, green gram, red gram (whole as well as dhals), cow pea, peas, rajmah, soya bean, beans, horse gram and sprouted pulses	Energy, protein, invisible fat, thiamine, riboflavin, folic acid, iron, calcium and fibre	• A combination of millets and cereals can be included to enhance the B vitamins, calcium, iron and fibre. • The ratio of cereal protein to pulse protein should be 4:1 to improve protein quality. • Add soya bean because it has valuable pulse protein. • Take at least 2 servings of pulses per day (60g)
2	**Vegetables and Fruits** **Green leafy vegetables (G.L.V):** Amaranth, spinach, drumstick leaves, beetroot leaves, coriander leaves, curry leaves, mustard leaves, fenugreek leaves	Carotenoids, riboflavin, folic acid, calcium, iron, fibre	• Include green leafy vegetables in daily diet
	Other vegetables: Carrot, onion, brinjal, ladies finger, capsicum, beans, drumstick, cauliflower	Carotenoids, folic acid, calcium, fibre	• At least one medium size fruit should be included per day
	Fruits: Guava, tomato, mango ripe, papaya, orange, sweet lime, water melon, grapes, amla	Carotenoids, vitamin-C, fibre	• Include at least 100 g green leafy vegetables and 100 g fruit in the diet

Table 2.1 Importance of Basic Four Food Groups (Continued)			
S. No.	**Food Groups**	**Main Nutrients**	**Dietary guidelines (or) Tips**
3	**Milk and milk products, egg, meat and fish**		
	Milk and Milk Products: Milk, curd, skimmed milk, cheese	Protein, fat, riboflavin, calcium,	• Include at least 100 ml of milk in any form
	Egg	High biological value protein, vitamin A	• Take 3 eggs per week
	Meat: Chicken, liver, mutton	Protein, fat, vitamin-A, cyanocobalamin	• 30 g of non-vegetarian foods can be a replacement for pulses
	Fish	Omega3 Fatty acid, Vitamin A & E	• Include Sea food
4	**Oils & fats and nuts & oilseeds:** Butter, ghee, hydrogenated fat (vanaspathy), gingelly oil, groundnut oil, mustard oil, coconut oil, Ground nuts, Gingelly seeds, Cashew nuts, Almonds	Energy, fat, essential fatty acids, fat soluble vitamins	• Limit the use of ghee and oil • Avoid using reheated oils • Take at least 5 nuts per day

Procedure:

i. Record a day's menu of each student.

ii. Assess the inclusion of food group against the check list.

iii. Give suggestions to improve the menu.

Record breakfast, lunch, tea and dinner. Evaluate against the checklist by giving suggestions for improvements.

Table 2.2 Check List				
Meals	**Food eaten**	**Food groups**	**Check list (✓/×)**	**Suggestions to improve the meal**
Early morning/ Breakfast/ Mid-morning	**Sample meal** Tea Idli Coconut chutney	Cereals Millets	✓ ×	Millets can be included to add variety
		Pulses legumes	✓ ×	Legumes can be included to add variety

Table 2.2 continued

Table 2.2 Check List (Continued)

Meals	Food eaten	Food groups	Check list (✓/×)	Suggestions to improve the meal
		Milk	✓	
		Meat/egg	×	
		Vegetables		Add vegetable cutlet & lime juice in midmorning
		G.L.V	×	
		Roots & tubers	×	
		Other vegetables	×	
		Fruits	×	
		Nuts/oil seeds	✓	
		Fat/oil	✓	
		Sugar/jaggery	✓	
Lunch		Cereals		
		Millets		
		Pulses		
		legumes		
		Milk		
		Meat/egg		
		Vegetables		
		G.L.V		
		Roots &tubers		
		Other vegetables		
		Fruits		
		Nuts/oil seeds		
		Fat/oil		
		Sugar/jiggery		
Evening tea/ Dinner		Cereals		
		Millets		
		Pulses		
		Legumes		
		Milk		
		Meat/egg		
		Vegetables		
		GreenLeafyVegetables		
		Roots & tubers		
		Other vegetables		
		Fruits		
		Nuts/oil seeds		
		Fat/oil		
		Sugar/jaggery		

Results and Discussion:

2.2 Planning Balanced Menu for a Student

Aim: To plan a balanced menu for a student using a food pyramid and tips from basic four food groups.

Sample Recipe – Vegetable Pulao

Ingredients		Quantity
Basmati rice	:	2 cups
Ginger garlic paste	:	½ tsp
Carrot	:	½ cup
Beans	:	¼ cup
Green peas	:	¼ cup
Cauliflower	:	¼ cup
Onion	:	2 medium
Bread slices	:	To decorate
Ghee	:	2 tbsp
Spices	:	½ tsp
Cashew nuts	:	10g

▲ Plate 2.1 Vegetable Pulao

Method

- Wash rice, drain and sauté it in ghee
- In a pressure cooker, add ghee, spices, sliced onion, ginger garlic paste, cut vegetables, peas and sauté well
- Add rice to the measured quantity of water with salt and cook
- Open the cooker and decorate the pulao with roasted cashew nut and bread pieces.

Table 2.3 Sample Menu

Meals	Food eaten	Foods included	
		Food groups	Ingredients
Early morning	Milk	Cereals	Rice
		Pulses	Black gram dhal
Morning	Ghee dosai,		Bengal gram dhal, Red gram dhal
	Coconut chutney	Milk/Meat	Milk
	Drumstick sambar	Vegetables/ Fruits	Drumstick, Greens
	Guava		Guava, Lime
Midmorning	Greens vadai Lime Juice	Fats/oil/Sugar	Sugar, ghee
Lunch	Green soup	Cereals	Rice
	Vegetable pulao	Pulses	Peas
	Egg curry	Milk/Meat	Egg
	Onion raita	Vegetables/ Fruits	Carrot, Beans, Green leafy vegetable, Cauliflower, Onion, Papaya, Apple
	Fruit salad	Fats/oil/Sugar	Ghee, oil

Table 2.3 continued

Table 2.3 Sample Menu (Continued)			
Meals	**Food eaten**	**Foods included**	
		Food groups	**Ingredients**
Evening	Vegetable samosa Dates milk shake	Cereals	Wheat flour, Maida
		Pulses	Channa
		Milk/Meat	Milk
Dinner	Methi chappathi Channa masala	Vegetables/ Fruits	Carrot, Beans, Potatoes, Dates, Methi leaves, Banana
Bed time	Milk, Banana	Fats/oil/Sugar	Oil, sugar

Table 2.4 Balanced Menu			
Meals	**Food eaten**	**Foods included**	
		Food groups	**Ingredients**
Early morning		Cereals	
		Pulses	
Morning		Milk/Meat	
		Vegetables/Fruits	
Midmorning		Fats/oil/Sugar	
Lunch		Cereals	
		Pulses	
		Milk/Meat	
		Vegetables/Fruits	
		Fats/oil/Sugar	
Evening		Cereals	
		Pulses	
Dinner		Milk/Meat	
		Vegetables/Fruits	
Bed time		Fats/oil/Sugar	

Results and Discussion:

2.3 Identification of Medicinal Herbs and Formulation of a Recipe

Aim: To gain knowledge about the common Indian herbs and gain the skill of creating recipes using herbs.

Equipment needed: Sauce pan, frying pan, spatula, spoon, cups.

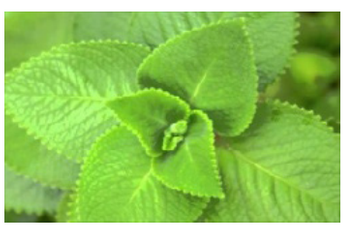
An herb is a plant or plant part used for its scent, flavor or therapeutic properties. Herbal medicines are one type of dietary supplement. Following list gives therapeutic uses of herbs.

Table 2.5 Medicinal Herbs and its Uses

Herbs	Therapeutic Uses
 ▲ Plate 2.2 Curry Leaves	Used for blood circulation, menstrual problems. Relieves kidney pain and treating diabetes.
 ▲ Plate 2.3 Coriander leaves	Acts as a tonic for stomach and heart. Used for treating urinary tract infection.
 ▲ Plate 2.4 Mint	It contains antioxidant and anti-inflammatory agent called rosmarinic acid to treat allergies. It is natural anti- microbial agent and breath freshener
 ▲ Plate 2.5 Aloevera	It soothes rashes and skin irritation, treats burns. It moisturizes hair and scalp. It treats constipation, helps in digestion. It boosts immune system, provides antioxidants and reduces inflammation

Table 2.5 continued

Table 2.5 Medicinal Herbs and its Uses

Herbs	Therapeutic Uses
 ▲ Plate 2.6 Tulsi	It is well known immunity booster It tolerates stress. It relieves mouth ulcers. It treats skin disorders. It promotes hunger and treats bronchitis.
 ▲ Plate 2.7 Mudakathan Keerai	Used to treat joint pain, arthritis. Treats itchy scalp and dandruff Treats eczema. Treats menstrual cramps.
 ▲ Plate 2.8 Karpooravalli	It helps to alleviate cold, cough and reduce sore throat It treats asthma and bronchitis It aids in digestion
 ▲ Plate 2.9 Fenugreek	It acts as a bulk laxative It is used for allergies, coughs, flatulence It helps to cure ulcers in stomach It helps in regulating diabetes.
 ▲ Plate 2.10 Lemon Grass	It is used to treat digestive tract spasms and stomach ache. Used to control high blood pressure. It helps to treat rheumatism.
 ▲ Plate 2.11 Keezha Nelli	It treats Jaundice. It controls blood sugar levels and It treats kidney stones.

Sample Menu - Vendhaya Keerai Soup

Ingredients		Quantity
Fresh fenugreek leaves	:	1 cup
Onion (finely chopped)	:	½ cup
Ripe tomato (finely chopped)	:	1 large
Garlic (minced)	:	3-4 pods
Diluted dhal water	:	2 cups
Salt	:	To taste
Pepper powder	:	To taste
Sesame seed oil	:	2 tsp

▲ Plate 2.12 Vendhaya Keerai Soup

Method

- Clean, wash and chop methi leaves. Chop onion, garlic and tomatoes finely.
- Heat oil in a pan; add onion, garlic and sauté until onions turn transparent.
- Add tomatoes and cook for few minutes.
- Add chopped methi leaves (vendhaya keerai) and sauté until the greens cook.
- Add 2 cups of diluted dhal water , salt to taste and simmer for 15 minutes.
- Add pepper powder to taste and serve piping hot.

Results and Discussion:

2.4 Different Types of Cutting

Aim: To learn the different techniques of cutting vegetables and gain the skill of preparing recipes using different types of cutting.

Importance of cutting

Cutting vegetables into uniform shapes and sizes is important for two reasons:

1. It ensures even cooking.
2. It enhances the appearance of the product

Common vegetable cuts

- **Brunoise (broon-wahz):** Fine dices (3mm × 3mm × 3mm)
- **Dicing:**
  - **Small dice:** (6mm × 6mm × 6mm)
  - **Medium dice:** (12mm × 12mm × 12mm)
  - **Large dice:** (2cm × 2 cm × 2cm)
- **Julienne (or allumette):** (3mm × 3mm × 6cm)
- **Batonnet:** Means ' little sticks' (6mm × 6mm × 6-7.5cm)
- **French fries or pommefrite:** 8-12mm sq. × 7.5 cm long.
- **Chop:** to cut into irregular shaped pieces.
- **Concasser (con-cass-say):** to cut coarsely.
- **Mince:** to chop into very fine pieces.
- **Shred:** to cut into thin strips, either with the coarse blade of a grater or with a knife.

Sample menu - Vegetable soup (Dicing)

Ingredients		Quantity
Onion (Diced)	:	1 cup
Cauliflower	:	½ cup
Carrot (Diced)	:	¼ cup
Beans	:	1 cup
Cabbage (Chopped)	:	¼ cup
Green peas	:	¼ cup
Butter	:	5 g
Corn flour	:	2 tbp
Milk	:	1 cup
Salt and pepper	:	To taste
Sliced roasted bread	:	To garnish

Method

- Dice the vegetables except green peas
- Keep aside ½ cup of diced vegetables
- Chop onions finely
- Pressure cook other half onion and 1/2 cup of diced vegetable
- Grind the cooked vegetables
- Strain and separate the stock
- Heat a pan and melt butter

▲ Plate 2.13 Vegetable Soup (Dicing)

- Fry onion and ¼ cup of diced vegetables.
- Make a paste of corn flour with milk and add to it.
- Pour the vegetable stock and cook for few minutes.
- Serve hot with salt and pepper.
- Garnish with fried bread cubes.

Results and Discussion:

Chapter 3 Selection of Foods and Methods of Cooking

3.1 Methods of Measuring Ingredients

Aim: To know the different methods of measuring ingredients

Equipment needed: Weighing balance, spoon, knives, plates and measuring cups.

A. Procedure:

I. Methods of measuring ingredients

1) Heaping:

- Fill the measuring cup with dry ingredients.
- Do not tap or shake the cup
- After heaping take the weight of the cup with ingredient.

▲ Plate 3.1 Heaping

2) Leveling

- Measure the ingredient as in (a) but the sides are leveled off with the help of the edge of a knife.
- In case of flour, repeat the above method after sifting the flour.

▲ Plate 3.2 Levelling

3) Tapping

- Measure the ingredients as in (a)
- But tap the cup after each addition and level with the sharp edge of the knife.

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II. Methods of measuring fat

1) Loose packing

- Press the fat into a measuring cup till it is up to mark.
- Take the weight
- Repeat for three times and calculate the mean value.

▲ Plate 3.3 Firm Packing

2) Firm packing

- Pack the fat firmly into the measuring cup and level with the sharp edge of the knife.
- Take the weight
- Repeat for three times and calculate the mean value.

III. To measure powder food in small quantities

- Sift the powder and fill into a cup using a dry spoon and level with the sharp edge of the knife.
- Repeat the process for three times
- Calculate the mean weight

B. Give the equivalence of the following:

- One cup =
- One teaspoon =
- One tablespoon =

Results and Discussion:

3.2 Methods of Cooking

Aim: To formulate and prepare recipes using the following methods of cooking in order to understand the procedure.

Equipment needed: Pressure pan, sauce pan, kadai, spatula, vessels and steamer.

Cooking: Food preparation is an important step in meeting the nutritional needs of the family. The process of subjecting food to the action of heat is termed as cooking. Heat is transferred to the food by conduction, convection, radiation or microwave energy.

Cooking takes place by moist and dry heat methods. Moist heat involves water and steam. Air or fat are used in dry heat methods.

Procedure

A. Steaming – Idli

- Take 1-2 glass of water in the steamer and bring it to boil
- Grease idli moulds and pour batter into it.

▲ Plate 3.4 Steaming

- Place moulds in the steamer
- Cover steamer with a lid
- Steam the idlis for 10 minutes over medium flame.

B. Blanching - Tomatoes

- Boil a pot of water.
- Remove from fire
- Add 4-5 tomatoes to the boiling water
- Allow 2-3 minutes and remove from the boiling water.
- Put the tomatoes in ice water.
- Remove the tomatoes from the ice water and peel skin.

▲ Plate 3.5 Blanching

C. Poaching - Egg

- Boil water in a sauce pan.
- Break an egg in the centre; slide the contents into the boiling water.
- Cook for three minutes and remove from water.

D. Deep fat frying - Poori

- Heat oil in a deep fat frying pan or kadai.

▲ Plate 3.6 Poaching

- When the oil is sufficiently hot immerse rolled poori
- Fry gently pressing down with the perforated spoon in a circular motion.
- Turn over when puffed up and fry till golden brown.

▲ Plate 3.7 Deep Fat Frying

I. Methods of cooking different ingredients

Table 3.1 Methods of Cooking

S.No.	Ingredients	Methods of Cooking
1	Rice	Pressure cooking
2	Green gram dhal	Boiling
3	Vegetables	Steaming
4	Apple	Stewing
5	Tomatoes	Blanching

II. Give recipes using the following cooking methods

1. Steaming : Idiappam and Dhokla
2. Pressure cooking : Plain pulao and vegetable kuruma
3. Frying : Bonda, French fries
4. Roasting : Aval, Popcorn
5. Boiling : Soup, Porridge

III. Using the following ingredients formulate recipe with suitable cooking methods

Table 3.2 Suitable Cooking Method

S.No.	Ingredients	Recipe	Method of Cooking
1	Semolina and vegetable	Kichadi	Boiling
2	Rice and dhal	Pongal	Pressure cooking
3	Ragi flour and jaggery	Porridge	Boiling
4	Wheat flour and greens	Stuffed chappathi	Shallow fat frying
5	Milk and egg	Pudding	Steaming

Results and Discussion:

3.3 Fireless Cooking – Salad Preparation

Aim: To understand the value of fireless cooking and to prepare a recipe without fire.

Equipment needed: Bowl, sauce pan, grater, knives.

Value of fireless cooking:

- There is no overhead cost in this preparation
- It saves fuel
- No inconvenience in the kitchen
- Nutrients are best conserved
- Less time spent in the kitchen.

Recipe formulation: Mixed vegetable and fruit salad

Ingredients	Quantity
Carrots (Peeled and grated)	: 1 cup
Cucumber (Peeled and grated)	: 1 cup
Pineapple (Cut into cubes)	: 1 cup
Pomegranate (Peeled)	: 1 cup
Almonds (Chopped)	: ¼ cup
Salt and Pepper	: to taste

▲ Plate 3.8 Salad

Method:

- Mix all grated vegetables and fruits in a bowl together.
- Add salt and pepper and stir it well
- Finally add chopped almonds and serve.

Results and Discussion:

3.4 Stages of Sugar Cookery

Aim: To study the different stages of sugar cookery.

Equipment needed: Sauce pan, spatula, vessels, bowl, slotted spoon.

Procedure

- Dissolve 200g of sugar in a cup of water
- Boil the solution; note the rise in the temperature with constant boiling.
- Find out the corresponding temperature at different stages using cold water test.

Example for Soft ball stage

Coconut Burfi

Ingredients		Quantity
Grated coconut	:	2 cups
Sugar	:	1½ cup
Ghee	:	2 tsp
Cardamom powder	:	⅛ tsp
Water	:	¼ cup
Chopped cashews	:	As required

▲ Plate 3.9 Coconut Burfi

Table 3.3 Stages of Sugar Cookery

Product	Temperature (0F)	Doneness	Description of test
Syrup (jelabi)	110–112	Thread	Syrup spins to a 2 inch thread between thumb and index finger
Burfi, fondant, fudge	112–115	Soft ball	Syrup when dropped into cold water forms ball that flattens on removal from water.
Boondi, Laddoo	118–120	Firm ball	Syrup when dropped into cold water, forms a ball that does not flatten on removal from water
Divinty marshmallows	121–130	Hard ball	Syrup when dropped into cold water forms a ball that is hard enough to hold its shape.
Butter scotch coffee	132–143	Soft crack	Syrup when dropped into cold water forms thread that are hard but not brittle
Brittle glace	149–154	Hard crack	Syrup when dropped into cold water forms threads that are hard and brittle.
Barley sugar	160	Clear liquid	Sugar liquefies
Caramel (Peanut brittle)	170	Brown liquid	Liquid becomes brown

Method:

1. Roast grated coconut with ghee and keep it aside.
2. Mix water, sugar and bring it to boil till it gets a soft ball consistency.
3. Add roasted coconut gradually and stir it constantly.
4. Apply little ghee on a tray and transfer the mixture on to it.
5. Cut into pieces after cooling.

Results and Discussion:

Chapter 4 Food Service Equipment

4.1 Market Survey of Equipment

Aim: To know about the equipment available in the market.

Tools used: Questionnaire

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Model Questionnaire

1. Name of the Equipment
2. Brand of the Equipment
3. Market of the Equipment
4. Type of the Equipment
   * Large * Medium * Small
5. Kind of Equipment
   * Food production * Service * Office * Measuring/weighing
6. Material of the equipment
7. Cost of the Equipment (range).
   1 2 3
8. Suitability of the equipment to the operation
   1 Large business 2 Medium business 3 Small business
9. Space required for the equipment.
10. Ease of dismantling parts
11. Ease of maintenance and cleaning.
12. Electricity requirements of the equipment.
13. Availability of service after sale.

14. Warranty period
15. Availability of spare parts/Extra attachments.
16. Capacity of the equipment (output)
17. Is the equipment suitable for the output in terms of desirable size or shape?

Results and Discussion:

4.2 Visit to a Food Outlet and Report

Aim: To visit and find the various equipment which are used in the food outlet.

Tools: Model Questionnaire

Note: Students can use the questionnaire to find out the information about the equipment used in the food outlet.

Model Questionnaire

1. Name/Brand of the equipment :
2. Model No. :
3. Make of the equipment :
4. Cost of the equipment :
5. Capacity of the equipment :
6. Electrical requirements for the equipment :
7. Accessories with the equipment :
8. Durability of the equipment :
9. After sales service of the equipment by the suppliers :
10. Warranty period for replacement of major/minor parts :
11. Availability of instruction manual :

Results and Discussion:

Chapter 5 Bakery

5.1 Preparation of Yeast Solution

Aim: To obtain the skill of preparing yeast solution.

Equipment needed: A bowl, thermometer, spoon and a stove.

Preparation of Yeast Solution

Yeast is the essential ingredient in bread baking. Since yeast is a living organism, having fresh yeast and using it properly will help in successful baking.

Important tips

- Always use dry yeast at room temperature.
- Using a thermometer is the most accurate way to determine the correct liquid temperature. Any thermometer will work as long as it measures temperatures between 75°F and 130°F.
- Yeast can be **dissolved in water** before mixing with the rest of the dry ingredients.
- Rehydrating dry yeast before using gives it a "good start" – the yeast feeds on the sugar allowing it to become very active and ready to work in dough.
- Water is recommended for dissolving yeast.
- Dissolve 1 tsp. sugar in 1/2 cup water (110°F–115°F).
- Stir in the yeast until completely dissolved.
- Let the mixture stand until yeast begins to foam vigorously (5 – 10 minutes).
- Now yeast solution is ready for preparing dish.

Recipes using yeast solution

Doughnut

Ingredients		Quantity
For yeast solution:		
Yeast	:	1tsp
Water	:	30 ml
Sugar	:	10 g
For the dough:		
Maida	:	200 g
Baking powder	:	3 g
Milk powder	:	10 g
Egg	:	1
Water	:	70 ml
Sugar	:	20 g
Fat	:	30 g
Salt	:	3 g
Vanilla essence	:	5 drops
Lemon essence	:	2 drops

▲ Plate 5.1 Doughnut

▲ Plate 5.2 Pizza

Method

- Prepare yeast solution.
- Sift maida and baking powder twice.
- Mix together sugar, salt, fat, egg, essence and 350 ml of water.
- Add yeast solution, maida and the mixture of other ingredients and make dough.
- Ferment it for 1½ hours.
- Knock back the dough mixture and proof for 55 minutes.
- Roll the dough like doughnuts and deep fat fry till golden brown.
- Cover the doughnut with powdered sugar or warm fondant icing when the doughnut is warm.

Pizza

Ingredients

Maida/Wheat flour	:	250 g
Water	:	70 ml
Yeast	:	1tsp
Salt	:	to taste
Milk	:	50 ml
Egg	:	1
Vegetable oil	:	20 ml
Sugar	:	10 g

Vegetable Filling

Mushroom, capsicum, onion, tomato sauce, grated cheese and chopped garlic to taste.

Method

- Disintegrate yeast in milk.
- Sift maida twice.
- Mix oil and maida/wheat flour till crumb consistency.
- Add eggs, salt and sugar with the yeast solution.
- Mix gently to form dough.
- Rest for 15 minutes.
- Roll the dough to ½ inch thickness and place on a baking sheet.
- Proof for ¾ hour.
- Smear the sides with oil or milk or beaten eggs to get an enhanced finished product.
- Spread tomato sauce, spread filling and top with grated cheese.
- Bake at 450^0 F for 20-25 minutes.

Results and Discussion:

5.2 Preparation of Biscuits and Cookies

Aim: To obtain the skill of baking biscuits to start a bakery unit.

Equipment needed: Baking oven, mixing bowls, ladles, rolling pin and board, biscuit cutters.

Procedure

Biscuits: A small baked unleavened biscuit, typically crisp, flat and sweet.

Biscuits are classified according to the method of making like rubbed-in, creamed and so on.

Rubbed – in Biscuits: It is prepared by rubbing – in of the fat into the flour. This is done by placing the flour in a large mixing bowl, and then adding butter which has been cut into pieces then rubbing both the ingredients together between fingertips until the mixture resembles breadcrumbs.

Creamed Biscuits: Fat and sugar should be creamed like it is done for cakes. This is done by placing softened butter in a large mixing bowl, then adding the sugar, and beating the ingredients together with a wooden spoon or electric whisk, until the mixture is well blended, light and fluffy.

Depending on the type of biscuit being made, wet ingredients such as eggs or milk are stirred in before the flour or other dry ingredients are added. These dough are often very soft, so small spoonful are dropped onto baking sheets.

Whisked Biscuits: The name refers to the way in which the egg content is treated.

Egg whites are whisked until firm

Egg yolks/whole eggs are whisked together with the sugar until thickened and lightened.

These types of biscuits range from straight-forward whisked egg whites with added sugar in the form of light as air meringues to more substantial biscuits such as coconut macaroons.

Melted Biscuits: The recipes which include liquid sweeteners use honey, golden (corn) syrup or molasses. The biscuit is prepared after melting all sweeteners (including sugar) with fat and stirred until mixed well. The other ingredients are added to the melted ingredients and mixed in the saucepan. The mixture can be soft enough to easily drop from a spoon.

Varagu Biscuits

Ingredients		Quantity
Varagu flour	:	100 g
Wheat flour	:	100 g
Sugar (powder)	:	100 g
Cold butter	:	100 g
Baking powder	:	1 tsp
Vanilla essence	:	1/2 tsp
Milk	:	2 tsp

Method

- Roast varagu flour on a low flame until a nice aroma of roasted varagu is got. Allow it to cool.

▲ Plate 5.3 Varagu Biscuit

- Sieve together varagu flour, wheat flour and baking powder.
- Cut butter into pieces and add to the sieved flour.
- Rub-in until the mixture is crumbled.
- Add powdered sugar and mix well.
- Add little milk at a time and make smooth dough.
- Refrigerate the dough for 15-20 minutes.
- Dust wheat flour and roll the dough.
- Use biscuit cutters and cut into desired shapes.
- Place on a greased tray and bake at 180^{0}C for 15-20 minutes. Remove and cool the biscuits.

Short Bread Fingers

Ingredients		Quantity
Maida	:	120 g
Sugar	:	60 g
Butter	:	80 g
Vanilla essence	:	a few drops
Egg	:	for coating
Salt	:	a pinch

Method

- Sieve maida twice and add sugar.
- Rub- in butter with finger tips.
- Knead till smooth dough is got.

▲ Plate 5.4 Short Bread Fingers

- Roll and cut into fingers of 3/4th inch thick.
- Brush the top of each biscuit with egg.
- Bake at 300^0 F for 15 minutes.

Cookies

Aim: To obtain the skill of preparing cookies to start a bakery.

Equipment needed Mixing bowl, spoon, mixie, oven, egg beater

Procedure

Cookies are baked or cooked goods that are small, flat and sweet. They usually contain flour, sugar and some type of oil or fat. It may include other ingredients such as raisins, oats, chocolate chips and nuts.

Drop cookies are made from relatively soft dough that is dropped by spoonful onto the baking sheet. During baking, the mounds of dough spread and flatten. Chocolate chip cookies, oatmeal cookies and rock cakes are popular examples of drop cookies.

Stiff batter cookies are prepared from a stiff dough. It is made stiffer by refrigerating it

before cutting and baking. Then they are rolled into cylinders which are sliced into round cookies before slicing them into cookies. Pinwheel cookies are the best example for this.

Meringue cookies are light, airy, sweet, and crisp because whipped egg whites and sugar is the base of them. With no flour they are a perfect sweet treat for those eating gluten-free.

Sponge cookies are light and airy like the meringue cookies but whole egg is used instead of only egg whites.

Raisin cookies

Ingredients	Quantity
Wheat flour	: 100 g
Varagu flour	: 50 g
Butter	: 150 g
Sugar	: 100 g
Raisins	: 50 g
Egg	: 40 g
Baking powder	: a pinch
Vanilla powder	: 2 drops

Method

- Preheat oven to 190^{0}C.
- In a separate bowl, whisk together both the flours, baking powder and egg.
- Beat butter until smooth and creamy in a bowl.
- Add the flour mixture to the batter and mix thoroughly. Add enough milk to make a soft batter. Then add the raisins and beat until combined.
- For each cookie, drop about one tablespoon of batter onto the prepared baking sheet, spacing the cookies about 2 inches apart. Bake the cookies for about 15 to 20 minutes.
- Remove from oven and transfer the cookies onto a wire rack to cool.

Coconut cookies

Ingredients		Quantity
Maida	:	100g
Fat	:	50g
Sugar	:	50g
Desiccated coconut	:	30g
Granulated sugar	:	15g
Baking powder	:	1g

▲ Plate 5.5 Raisin Cookies

▲ Plate 5.6 Coconut Cookies

Method

- Sift the flour twice with baking powder.
- Mix all the ingredients to form homogenous dough.
- Break the dough into small pieces.
- Roll the dough and place over the baking sheet 1 inch apart.
- Bake at 250^0F for 15-20 minutes.

Results and Discussion:

5.3 Visit to a Bakery Unit or Shop

Aim: To assess and record the functioning of a bakery unit.

- Visit a nearby bakery unit or shop
- Collect the information
- Interpret and make a report

Results and Discussion:

Format

1. Name of the bakery unit or shop	:	
2. Location	:	
3. Number of workers	:	
4. Equipment available (List)	:	
Production	:	
Storage	:	
Packing	:	
5. Cleanliness	:	
Uniform and head gear	:	
Hygienic handling	:	
a. Raw ingredients	:	
b. Baked product	:	
Counter tops	:	
Ovens and moulds	:	
Display racks	:	
6. Working area	:	Available/Not available
Cake making	:	
Bread making	:	
Biscuits making	:	
Cookies making	:	
Pastries making	:	

7. Items prepared for sale

S.No.	Name of the items	Cost/Item	Total production/day
1			
2			
3			
4			

8. Service :
   Self- service :
   Table service :
   Take away :

9. Utilization of waste :
10. Method of disposing waste :

(**Interpret the observations and report**)

Chapter 6 Food Preservation

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6.1 Drying

Aim: To formulate recipes for the preparation of Onion vadagam and Sago vadagam.

Equipment needed: Drying trays, knives, table spoons, plastic sheets, vessels, chopping board, packaging machine and airtight containers.

Importance of sun drying

Fresh vegetables, fish and meat are dried by sunlight to decrease the moisture level, to inhibit the growth of microorganism and to control enzyme activity. Selection of vegetables, washing, peeling, cutting and blanching are the essential steps in drying process.

Recipe Formulation – Onion Vadagam

Ingredients		Quantity
Small onions	:	500g
Green chillies	:	50g
Cumin seeds	:	15g
Black gram dhal	:	100g
Mustard	:	5g
Asafoetida	:	5g
Garlic	:	10g
Curry leaves	:	10g
Salt	:	To taste

Method

- Remove the skin of the onions and chop or crush the onions.
- Soak black gram dhal in water till it becomes soft
- Grind black gram dhal, green chillies, garlic, cumin seeds and curry leaves
- Roast the mustard with little oil and add it to the ground dhal paste
- Add crushed onions, asafoetida and little salt
- Mix all the ingredients together into a thick consistency
- Take small balls and place over plastic sheet and allow it to dry in hot sun
- When it is fully dried, remove from the sheet and store it in an airtight container.

▲ Plate 6.1 Onion Vadagam

Recipe Formulation: Sago Vadagam

Ingredients		Quantity
Sago	:	500g
Water for cooking	:	2 litres
Green chillies	:	10 nos
Salt	:	As needed

Method

- Soak the sago for 1½ hours in water till it absorbs all the water. Add this to the hot water by adding salt and mashed green chillies paste.
- Boil the above mixture till it is a transparent liquid.
- Dry in sunlight by spreading with the table spoon to a round shape.
- Dry it till the moisture gets evaporated.
- Store it in an airtight container.

▲ Plate 6.2 Sago Vadagam

Results and Discussion:

6.2 Dry Powder

Aim: To formulate recipes for dry powder (Preparation of Kadamba powder and curry leaves powder and Nutri mix powder)

Equipment needed: Frying pan, mixie, teaspoons, polythene covers, air tight containers, packaging machine.

Importance of dry powders: Dried foods are preserved due to its low moisture content. It can be easily transported. Indian foods such as curry powders, vathal and vadagam are sun dried.

Recipe Formulation:

1. Kadhamba Podi

Ingredients		Quantity
Red gram dhal	:	½ cup
Bengal gram dhal	:	½ cup
Black gram dhal	:	½ cup
Green gram dhal	:	½ cup
Red chilli	:	10
Asafoetida	:	½ tsp
Curry leaves	:	Little
Oil	:	2 tsp
Salt	:	To taste

▲ Plate 6.3 Kadhamba Podi

Method

- Heat the pan and pour oil and fry red gram dhal, bengal gram dhal, black gram dhal and green gram dhal.
- Add red chilli, curry leaves, asafoetida powder and heat gently.
- Allow it to cool for some time and then grind it in a mixie coarsely.
- Either can be eaten with idli or mixed with rice.
- The powder can be stored for a month in an airtight container.

2. Curry Leaves Powder

Ingredients		Quantity
Curry leaves	:	1 cup
Black gram dhal	:	¾ cup
Bengal gram dhal	:	¼ cup
Red chilli	;	10
Garlic	:	10 pods
Oil/Ghee	:	2 tsp
Asafoetida	:	½ tsp
Salt	:	To taste

▲ Plate 6.4 Curry Leaves Powder

Method

- Take curry leaves and dry it under shade.
- Heat the pan, add oil and fry Bengal gram dhal, black gram dhal and red chillies.
- Add curry leaves and garlic then fry the same by adding salt.
- Cool it and then grind it coarsely.
- The powder can be stored for a week in an airtight container.

3. Nutri Mix Powder (Sathu Mavu)

Ingredients		Quantity
Cereals	:	3 parts
Pulses	:	2 parts
Oil seeds	:	1 parts
Palatability component	:	2 parts

Method

- Clean and dry roast the ingredients separately.
- Cool and grind it in a mixie.
- Store in an airtight container for a month.
- Make it into a porridge/laddu with jaggery and serve
  - Any cereal or combination of cereals such as wheat/ragi/bajra/jowar can be taken.
  - Similarly any pulse/combination of pulses such as green gram/roasted Bengal gram dhal can be included.
  - Oil seeds such as peanuts/gingelly seeds/cashew nuts/almonds can be used.
  - As a palatability component jaggery, cardamom and flavouring agents can be incorporated.
  - Instead of sweet taste, salt can be added to porridge.

General instruction:

- Weigh the formulated product in terms of 50g, 100g and 250g
- Pack it in a polyethylene cover using a sealing machine or use ziplock cover.
- Label, calculate the total cost and determine the selling price.
- Advertise using proper audio visual aids.
- Sell the products within the campus and record the profit.

▲ Plate 6.5 Kanji Mavu

▲ Plate 6.6 Weighing of ingredients

▲ Plate 6.7 Packaging Machine

▲ Plate 6.8 Sealing of nuts using packaging machine

▲ Plate 6.9 Pickle stored in an air-tight container

Results and Discussion:

6.3 Preparation of Tomato and Lime Pickles

Aim: To formulate recipes for the preparation of tomato and lime pickles.

Equipment needed: Sauce pan, jars, weighing scale, measuring cups, vessels, spoons and ladles.

Importance: The process of preservation of food in common salt or in vinegar is called pickling. Spices and edible oil are added to make the product. Pickles are good appetizers and add to the palatability of the meal. Pickles aid digestion by stimulating the flow of gastric juice. Different kinds of pickles are made in several Indian homes. Some of the Indian pickles are mango, lime, tomato, onion, mixed vegetables such as potato, turnip, drumstick, beans and cauliflower.

Recipe formulation:

1. Tomato Pickle

Ingredients		Quantity
Tomato	:	500g
Garlic	:	50g
Red chillies	:	20g
Mustard	:	10g
Asafoetida powder	:	10g
Fenugreek	:	10g
Cumin seeds	:	10g
Turmeric powder	:	Little
Tamarind	:	50g
Gingelly oil	:	250ml
Salt	:	Required amount

▲ Plate 6.10 Tomato Pickle

Method

- Wash tomatoes and blanch in water. Cool and grind into a smooth paste in a mixie.
- Dry roast chillies, asafoetida, cumin seeds, fenugreek seeds and ¾th quantity of mustard and powder them.
- Soak tamarind in little quantity of water and take the clean pulp.
- Keep frying pan over the fire, add the gingelly oil and the remaining portion of mustard seeds. When it starts sputtering, add the clean garlic and fry.
- Add the tamarind pulp, chilli powder, turmeric powder, powdered spices and salt one by one and mix well.
- Remove from fire cool and store in sterilized bottles.

2. Lime Pickle

Ingredients		Quantity
Lime	:	500g
Red chillies	:	100g
Mustard	:	1 tsp
Fenugreek	:	1 tsp

Asafoetida	:	½ tsp
Gingelly oil	:	250ml
Salt	:	To taste

▲ Plate 6.11 Lime Pickle

Method

- Wash lemon and dry with a clean towel.
- Cut into pieces on a clean board to a desired size.
- Add salt and leave it in the sun light in a porcelain pot tied with the muslin cloth.
- Grind dry roasted red chillies, fenugreek seeds, mustard seeds into a coarse powder.
- Add this powder to the salted and sun-dried lime.
- Heat the oil and add little mustard seeds till it sputter.
- Add the seasoned oil on the salted and sun dried lime.
- Keep in sunlight for few more days till ready for consumption.
- Store it in sterilized air tight container.

Results and Discussion:

Student Performance Evaluation

Name of product	Sensory quality of the product	Techniques of packaging and Labelling	Selling price	Sales promotion technique	Profit

Chapter 7 Menus and Cuisines

7.1 Preparation of a North Indian Cuisine

Aim: To know about the preparation of a recipe from North Indian cuisine.

Equipment needed: Pressure pan, kadai, spoons, cups, mixer/blender.

Unique Features of North Indian Cuisine

- Foods of North Indian cuisine are wholesome and very rich in nutrients and tasty.
- Milk and milk products like paneer, curd, cream are used abundantly.
- Spices, masala powders and curry powders are used.
- Channa masala or chole masala is a classic Indian vegetarian dish prepared with Kabul channa.

Channa Masala

Ingredients		Quantity
Channa/kondaikadalai	:	1 cup
Onion	:	2 medium
Tomato (Big ones)	:	2 large
Green chilli	:	1
Ginger	:	1 inch piece
Garlic	:	3 pods
Salt	:	as required

Spice powder

Turmeric powder	:	¼ tsp
Chilli powder	:	1 tsp
Coriander powder	:	2 tsp
Channa masala powder	:	2 tsp

▲ Plate 7.1 Channa Masala

For the seasoning

Oil	:	2 tsp
Cumin seeds	:	1 tsp
Bay leaf	:	1

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Method

- Soak channa overnight and pressure cook channa with a little salt for 4-5 whistles and cooked channa should be soft.

- Grind ginger, garlic, green chilli and onion to a fine paste. Keep it aside.
- Puree tomatoes in a blender and keep it aside.
- Heat oil in a pan, add cumin seeds and bay leaf.
- Add the ground onion paste and the spice powder and saute till it turns to golden brown, stirring continuously.
- Add the cooked channa with 4 cups of water and until everything gets blended with the masala.
- Garnish with coriander leaves and serve hot with poori or chappathi.

Instruction

The above recipe can be prepared and sold by the students in the school campus.

Results and Discussion:

7.2 Preparation of South Indian Cuisines

Aim: To know about the preparations of South Indian cuisines.

Equipment needed: Pressure cooker, vessels, cups, kadai, spoons, knives and mixer.

1. Preparation – Tamil Nadu cuisine

Vegetable Uthappam:

- Dosa is a South Indian cuisine; it is rich in carbohydrates and proteins.
- It is usually prepared for breakfast or dinner
- Uthappam is a variety of dosa, which is slightly thicker than dosa. It can be called as Indian pizza.
- Uthappam can be served plain or with toppings of our choice. There are varieties like vegetable, onion, tomato.

Ingredients		Quantity
Dosa batter	:	3 cups
Onions (medium)	:	1 (chopped)
Tomatoes (medium)	:	1 (chopped)
Carrot	:	3 tbsp (grated)
Capsicum (Optional)	:	2 tbsp (chopped)
Green chillies	:	3
Coriander leaves	:	a little
Oil	:	as needed

Preparation of Dosa batter

Parboiled idli rice	:	3 cups
Black gram dhal	:	1 cup

▲ Plate 7.2 Vegetable Uthappam

Fenugreek seeds	:	¾ tsp
Salt	:	As needed

Method:

- Wash and soak both rice and dhal for 5-6 hours separately. Soak fenugreek seeds along with dhal.
- Drain the water and grind dhal and rice separately.
- Add salt in the ground batter and mix it well.
- Allow it to ferment for 7-8 hours.

Method (Uthappam)

- Grease the tawa with a little oil.
- Pour the dosa batter and spread it to a circle.
- Drizzle a teaspoon of oil around the uthappam.
- Sprinkle the finely chopped vegetables evenly on the top and drizzle a little oil around the uthappam.
- After the base is cooked, flip it over to the other side.
- Serve it with chutney or sambar.

Note: Add any toppings like grated paneer, grated beetroot, finely chopped mint leaves and make varieties.

2. Preparation of Kerala Cuisine

Ada Pradhaman: Ada pradhaman is traditionally prepared using rice ada, coconut milk and jaggery. Palada Pradhaman is prepared with milk, rice flakes and sugar. It is a main dish during Onam celebration in Kerala.

Ingredients		Quantity
Rice ada (Readymade)	:	½ cup
Milk	:	3 cups
Sugar	:	½ cup
Cardamom (powdered)	:	¼ tsp
Cashew nuts	:	10 gms
Raisins	:	10 gms
Butter/Ghee	:	½ tsp

▲ Plate 7.3 Rice Flakes (Ada)

▲ Plate 7.4 Ada Pradhaman

Method

- Soak ada in boiling water for 30 minutes.
- Wash the soaked ada in cold water for 2-3 minutes.
- Drain the water completely.
- Boil 3 cups of milk until it reduces to 2½ cups.
- Add the washed ada and stir in a low flame until it becomes soft.
- Add sugar and cardamom powder. Cook for some more time.
- Heat a teaspoon of ghee or butter fry cashew nuts and raisins separately.
- Add it to the payasam and serve it either hot or chill.

3. Preparation of Karnataka Cuisine

Vangi Bhath: Vangi Bhath is a Karnataka style recipe prepared with brinjal, takes less than 30 minutes with commonly available ingredients.

Ingredients		Quantity
Rice	:	1 cup
Brinjal	:	¼ kg
Onion (large)	:	1
Turmeric powder	:	¼ tsp
Masala powder	:	2 tsp
Jaggery	:	1tsp(powdered)
Tamarind	:	a small ball size
Salt	:	As required
Oil	:	As required
Mustard seeds	:	1 tsp
Black gram dhal	:	1 tsp
Bengal gram dhal	:	2 tsp

Asafoetida	:	a pinch
Curry leaves	:	5-6 leaves
Roasted peanuts	:	10 (as you like)
Coriander leaves	:	2 tbsp
Fresh lemon juice	:	1 tbsp

▲ Plate 7.5 Vangi Bhath

Vangi Bhath Masala Powder Preparation

Bengal gram	:	¼ cup
Black gram dhal	:	5 tsp
Coriander seeds	:	¼ cup
Dry red chillies	:	10
Pepper corns	:	¼ tsp
Desiccated coconut powder	:	¼ cup
Khuskhus	:	1 tsp
Cinnamon	:	1 piece
Cardamom	:	1
Cloves	:	4

Method

- Dry roast khuskhus in a pan and keep it aside.
- Dry roast the other ingredients (except coconut) on medium heat and keep it cool.
- Dry roast coconut powder slightly warm and add into the other ingredients.
- Powder all the ingredients.

Method – Vangi Bhath

- Spread the cooked rice on a plate to cool.
- Soak tamarind in 1/3 cup of water for 20 minutes. Extract thick juice.
- Wash and cut brinjals lengthwise and keep it in water to prevent discolouration.
- Heat oil in a pan; add mustard seeds, black gram dhal, bengal gram dhal, asafoetida, roasted peanuts and sauté.
- Add chopped onions and curry leaves.
- Add the brinjals, turmeric powder and salt.
- Cover and cook on low heat, stirring in between for even cooking
- Once it is cooked add vangi bath powder, jaggery powder and mix well.
- Add tamarind extract and cook.
- Once the brinjals are cooked add cooked rice, lemon juice and mix well.
- Garnish with coriander leaves and serve hot with pappads.

4. Preparation of Andhra Pradesh Cuisine

Pesarattu: Pesarattu is a very popular dish in Andhra Pradesh and it is served with uppuma as a breakfast menu.

Preparation

Ingredients		Quantity
Whole green gram	:	1 cup
Raw rice	:	1 tbsp

Green chillies	:	2-3
Ginger	:	1 piece
Salt	:	To taste
Onion (medium)	:	1finelychopped
Oil	:	As needed

▲ Plate 7.6 Pesarattu

Method

- Wash and soak whole green gram and rice together for 4-5 hours.
- Grind it with ginger, green chillies and salt coarsely. Let it set for 15 minutes.
- Add finely chopped onions to the batter and mix well.
- Make dosa with oil and serve with coconut or tomato chutney.

Instruction

The above recipes can be prepared and sold by the students in the school campus.

Results and Discussion:

7.3 Preparation of a Traditional Tamilnadu Cuisine

Aim: To know about the preparation of traditional Chettinad cuisine.

Equipment needed: Vessels, kadai, cutter, spoons, cups, mixie/blender.

Unique Features of Chettinad Cuisine

- The traditional Chettinad dishes mostly used locally available spices like the star anise, pepper, kalpasi and marattimokku.
- Chettinad kitchen is one of the largest and most important places in a Karaikudi house.
- Traditional meals served by Chettinad style on banana leaves follow a specific protocol.

Formulation of Recipe

Chicken Chettinad

Ingredients		Quantity
Chicken	:	500g
Onions	:	150g
Tomatoes	:	100g
Cinnamon	:	2g
Cardamom	:	1
Cloves	:	2g
Cumin seeds	:	5g
Curry leaves	:	2g
Coriander leaves	:	2g
Turmeric powder	:	10g
Salt	:	As required

▲ Plate 7.7 Chettinad Chicken

For grinding

Onions	:	100g
Ginger	:	50g
Garlic	:	50g
Fennel seeds	:	50g
Cumin seeds	:	50g
Pepper corns	:	25g
Red chillies	:	10g
Coconut	:	100g

Method

- Grind the ingredients to a paste.
- Clean and cut the chicken into pieces. Marinate the chicken with the paste.
- Chop the tomatoes, coriander leaves and the onions.
- Heat oil and add the cinnamon, cardamom, cloves and cumin seeds.
- Add the chopped onions and the curry leaves.
- Add the tomatoes and sauté for 5 minutes.
- Add the marinated chicken and turmeric powder.

- Sauté for 10 minutes, sprinkling water at intervals
- Add enough salt, cover with a lid and cook until done. Add more chilli or pepper, if required.

Instruction

The above recipe can be prepared and sold by the students in the school campus.

Results and Discussion:

Chapter 8 Food Microbiology

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8.1 Role of Microorganisms in Fermentation

Aim: To know the role of microorganisms in common fermented foods

Equipment needed: Stainless steel bowl lid, mixer, ladle, tawa

Fermentation: Fermentation is a metabolic process that consumes sugar in the absence of oxygen. The products are organic acids, gases, or alcohol. It occurs in yeast and bacteria, and also in oxygen-starved muscle cells, as in the case of lactic acid fermentation.

Table 8.1 Fermentation

Food	Fermented products obtained	Name of microbes
Cereals and millets	 ▲ Plate 8.1 Malt beverages	Yeast
Pulses	 ▲ Plate 8.2 Dhokla	Yeast
Cereals and pulses	  ▲ Plate 8.3 Idli and Dosa	Lacto bacteria lactis *Streptococcus* lactis
Milk	 ▲ Plate 8.4 Curd	Lacto bacilli

Recipe formulation – Foxtail Millet Dosa

Ingredients		Quantity
Foxtail millet	:	3 cup
Black gram dhal	:	1 cup
Fenugreek seeds	:	2 tsp
Salt	:	as required
Oil	:	as needed

▲ Plate 8.5 Foxtail Millet Dosa

Method

- Wash and soak foxtail millet, fenugreek seeds and black gram dhal separately for 5–6 hours.
- Grind separately to a smooth batter.
- Mix the batter with salt.
- Allow it to ferment for 5–6 hours.
- Heat tawa, pour a ladle of dosa batter on the centre and spread it round.
- Drizzle cooking oil and turn it, cook both sides until golden brown.
- Serve with any chutney.

Results and Discussion:

8.2 Tabulating Microorganisms Causing Food Spoilage

Aim: To tabulate microorganisms causing food spoilage in day today life

Table 8.2 Microorganisms Causing Food Spoilage and its Effect on Health

S.No.	Microorganisms	Mode of Transmission	Effect
I	**Bacteria**		
	1. *Clostridium Botulinum*	Canned foods such as peas, beans, meat, fish and other sea foods	Nausea, vomiting, diarrhoea, dry skin, even paralysis and death.
	2. *Staphylococcus bacteria*	Cream, filled baked goods, meat, poultry, gravies, sauces with cream and dairy products	Nausea, vomiting, diarrhoea, abdominal cramps, sweating.
	3. *Clostridium Perfringens*	Poorly cooked meat, fish, poultry	Nausea, abdominal pain and diarrhoea.
	4. *Salmonella bacteria*	Meat products, warmed up left overs, salads	Abdominal pain with fever, shivering, head ache
	5. *Shigella*	Poor hygiene of people handling food	Dysentery.
	6. *Streptococcal infection*	Contaminated drinking water, spoiled milk and milk products	Diarrhoea and other gastric disturbances.
II	**Yeast**	Through air causing fermentation in foods	Acidity and gastric disorders.
III	**Molds**	Through air and settling on moist foods like bread, fruits	Gastro intestinal disturbances.

Results and Discussion:

8.3 Observation of Hygienic Practices in a Hotel/Restaurant

Aim: To observe the hygienic practices in a hotel/ restaurant.

Tools: Questionnaire

Method: Observation and interview method using a questionnaire.

1. Name of the Restaurant :

2. Area : Rural/Urban

3. Hygiene

Kitchen

1.	Did the kitchen have all the equipment?	List them.
2.	Whether the ceiling, walls and floor are clean?	Yes/No
3.	Was pre-preparation done properly?	Yes/No
4.	Equipment cleanliness:	Good/Poor
5.	Is there proper ventilation in the kitchen?	Yes/No
6.	Are there enough taps with running water?	Yes/No
7.	Is the kitchen well lighted?	Yes/No
8.	Did the cooks hygienically handle food?	Yes/No
9.	What kind of storage facilities do they have? Dry ▫ Cold - Refrigeration ▫ Freezing ▫	
10.	Is the food served immediately after being cooked?	Yes/No
11.	Hot foods are stored in Bain-marie or hot cases or cabinets	Yes/No
12.	Are the cooks clean and well groomed?	Yes/No
13.	Mention the safety techniques followed in the kitchen?	
14.	Whether the kitchen is spacious?	Yes/No
15.	How many cooks and helpers are there?	

16. How many dishes are made in the kitchen?
17. How do they dispose waste?
18. Do they clean the kitchen after work and before they start work? Yes/No
19. What is the time for last order?
20. Are the sharp instruments kept safely? Yes/No

Record the Visit with the Questionnaire and Report

Results and Discussion:

Chapter 9 Attitude and Personality Requirements

9.1 Observation of General Etiquettes of Food Service Personnel

Aim: To observe the General Etiquettes of Food Service Personnel.

Tool: Questionnaire

Method: Observation and interview method using a questionnaire.

1. Name of the Restaurant :

2. Area : Rural/Urban

Etiquettes of the Food Service Personnel

1. Receiving guests with a smile		Yes/No
2. Greeting the guests politely		Yes/No
3. Providing proper seating facility		Yes/No
4. Presenting the menu card	:	Yes/No
5. Suggestions while taking orders	:	Yes/No
6. Information about the time of preparation of menu ordered	:	Given/Not given
7. Serving manner		
Preplated	:	Right/Left
Individual items	:	Right/Left
8. Whether attentive to guest	:	Very attentive/ Not attentive
9. Fulfilling the personal requirements of the guests	:	Yes/No

Hygiene

Personal Grooming

1. Hair neatly cut and combed	:	Yes/No
2. Nails cut short and clean	:	Yes/No

3. Gloves while serving	:	Yes/No
4. Apron and uniform clean and ironed	:	Yes/No

Attitude

1. Always polite	:	Yes/No
2. Always with a smile	:	Yes/No
3. Attentive to guests	:	Yes/No
4. Positive body language and gesture	:	Yes/No
5. Listen to guests complaints carefully and solve them	:	Yes/No

Record the Visit with the Questionnaire and Report

Results and Discussion:

MODEL QUESTIONS

I. Spotters (5 x 3 = 15)

Group I	A. Thulasi	B. Measuring equipment
	C. Steaming	D. French Cuisine
		E. Fungus
Group II	A. Curry leaves	B. Prepreparation equipment
	C. Frying	D. Chinese Cuisine
		E. Yeast
Group III	A. Coriander	B. Cooking equipment
	C. Blanching	D. Italian Cuisine
		E. Drying

Group IV	A. Mint	B. Serving equipment
	C. Pouching	D. North Indian Cuisine
		E. Salting
Group V	A. Fenugreek leaves	B. Cleaning tool
	C. Toasting	D. South Indian Cuisine
		E. Pickling

II. Questions (1 x 60 (20+40) =60)

1. Elaborate on the production equipment and prepare a recipe using only one equipment.
2. Plan a day's menu using four food group and food pyramid. Prepare the item marked.
3. Write a note on any five herbs and prepare a recipe using any one herb.
4. List and describe the types of cutting? Prepare one recipe using any one of the methods of cutting.
5. What are the stages of sugar cookery? Prepare a recipe based on it.
6. Give a short note on cooking without fire. Prepare a recipe related to it.
7. Explain the North Indian cookery. Prepare a recipe on it.
8. Indicate any five significant South Indian dishes. Prepare a recipe based on it and display.
9. What do you mean by cookies and explain. Prepare a recipe.
10. Describe the preparation of yeast solution. Prepare a recipe using yeast.
11. Bring out the importance of pickling and explain the pickling methods . Prepare a recipe.
12. Briefly write on drying foods. Prepare a dry powder.
13. Plan a questionnaire to assess the star category of hotels.

Internal Marks - 25

Record	:	10
Project/Assignment/Case Study	:	5
Attendance	:	5
Test	:	5
Total	:	**25**

External Marks - 75

Spotters	: 15
Answer for a question	: 20

Practical skill - (40)

Colour	: 5
Taste	: 5
Appearance	: 5
Texture	: 5
Menu card	: 10
Display	: 10
Total	**: 75**

Guidelines for Project and Case Study

Project

I. Identification/formulation of topics
II. Objectives
III. Collection of Data (Questionnaire/Observation/Interview)
IV. Interpretation of Data
V. Findings and Conclusion

Case Study

1. Name of the food service institution	:
2. Location	:
3. Type of institution	: Commercial/Non Commercial:
4. Year of starting	:
5. Name of the person in-charge	:

I. Organizational set up

1. Number of departments :
2. Organizational chart :
3. Lay out :
4. Equipment :
   a) Production
   b) Storage
   c) Distribution
5. Insurance :

II. Service

1. Types of menu :
2. Types of cuisines :
3. Whether standardized recipes followed : Yes/No
4. Food cost :
5. Types of service :

III. Employees

1. Number of employees (Departmental wise) :
2. Employee's benefit :
3. Grooming :

IV. Cleanliness

1. Personal Cleanliness :
2. Environment Cleanliness :

V. Miscellaneous

1. Problems faced by institutions :
2. Customer satisfaction :

Food Service Management Model Question Paper

STD XI

MARKS: 90 **TIME: 2.30**

I. Choose the correct answer: **(1x15 = 15)**

1. The three T's due to which hospitality industry emerged was .....
   a. Travel, Tourism, Treatment
   b. Travel, Tourism, Trade
   c. Travel, technology, Trade
   d. Travel, Treatment, Technology
2. Storage area is best located near a……. in a food service
   a. kitchen
   b. food service area
   c. Washing area
   d. Security area
3. Cereals are rich source of ……..
   a. Carbohydrates
   b. Proteins
   c. Vitamins and Minerals
   d. Fats
4. ..... is the sense of food.
   a. Texture
   b. Ambience
   c. Appearance
   d. Taste
5. Purchasing through ……. is suitable for large food service operation.
   a. Auction c. Formal
   b. Online d. Direct
6. ..... can be poached.
   a. Greens
   b. Apples
   c. Eggs
   d. Chicken
7. When ..... is stressed the slicer will determine the amount to be sliced.
   a. Balance
   b. Portion control
   c. Variety
   d. Appearance
8. ..... is used to keep food warm in a buffet.
   a. Chafing dish
   b. Salad bowl
   c. Platter
   d. Utensils

9. Browning of baked items is due to ……

a. Coagulation of gluten and eggs

b. Caramelization of sugar

c. Reaction between amino acids and reducing sugars

d. Gelatinization of starch

10. ..... has a retarding effect on yeast fermentation.

a. Salt c. Water

b. Sugar d. Honey

11. Removal of microorganisms is called ……

a. Filtration

b. Asepsis

c. Dehydration

d. Drying

12. A la carte means ……..

a. Thali c. Host table

b. Entrée d. Selective menu

13. Mono sodium glutamate is used in …… cuisine.

a. Italian

b. Indian

c. Chinese

d. French

14. When yeast converts sugar into ……, carbon –di-oxide is formed which helps in the raising of dough in bread.

a. Hydrogen sulphide

b. Aldehyde

c. Alcohol

d. Sodium Chloride

15. ……. will bring in more customers and will generate revenue.

a. Frown

b. Whistle

c. Smile

d. Punctuality

II. Answer any 10 of the following: **(3x10=30)**

Question 16 is compulsory

16. Define food service management. What is its main objective?

17. Enumerate the principles of food and health.

18. Tabulate the food purchase chart.

19. What are the risks of fast food consumption?

20. How are equipment classified based on the mode of operation?

21. Explain tools for blending.

22. What is margarine? Why is it used in the baking industry?

23. Give an account on post-harvest losses.

24. Write a note on foods prepared by fermentation.

25. Enlist the types of menu?

26. List the courses of menu served in Tamilnadu.

27. Give a short account on cheese.

28. Enumerate the tips on positive body language.

III. Answer any 5 of the following: **(5x5=25)**

Question 29 is compulsory

29. What are the general etiquette in food service operations?
30. How will you handle the knife safely? Why is uniform cutting of vegetables important?
31. Tabulate the ideal ways of storing food.
32. Mention the different types of equipment used in different food service areas.
33. Give an account on leavening agents.
34. Write a note on canning.
35. How will you prepare a menu card?

IV. Answer in detail: **(10x2=20)**

36. How to make food suitable for a customer in food service?

    OR

    Give a detail account on care, maintenance and sanitation of equipment.

37. Explain the types of International cuisines?

    OR

    How can you safe guard food? Mention the hygienic practices.

Web-Links

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1. FOOD SERVICE OPERATIONS

https://www.youtube.com/watch?v=7HcaObhA82I – How to Operate a Successful Restaurant

https://www.youtube.com/watch?v=QpYX4GfSiH -AFood Costs Formula: How to Calculate Restaurant Food Cost Percentage

https://www.youtube.com/watch?v=dCKDAzwqe-M-- Motor hotel- 2 star

2. BASICS OF FOOD

https://www.youtube.com/watch?v=Gmh_xMMJ2Pw -How to Create a Healthy Plate

https://www.youtube.com/watch?v=G-Fg7l7G1zw- Basic Knife Skills

3. SELECTION OF FOODS AND METHODS OF COOKING

https://www.youtube.com/watch?v=_QuU6rs-n5Q&t=1s-Cooking Methods

4. FOOD SERVICE EQUIPMENT

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

5. BAKERY

https://www.youtube.com/watch?v=AWo9NcOTp0U- Rubbing method

6. FOOD PRESERVATION

https://www.youtube.com/watch?v=UWhkFYDB8J4-Need and Benefits of food Preservation

https://www.youtube.com/watch?v=RXDSJQWylUE- NEWS7 TAMIL Mango pulp units in Krishnagiri Tamilnadu

https://www.youtube.com/watch?v=UxFdzkzAOEo-”chakka varuthathu-YouTube

https://www.youtube.com/watch?v=z3iQ9fpylxg- RTS juice processing and packaging line-YouTube

7. MENUS AND CUISINES

https://www.youtube.com/watch?v=dDJca97viS4-Types of Menus

https://www.youtube.com/watch?v=ry1E1uzPSU0-What Does the World Eat for Breakfast?

8. FOOD MICROBIOLOGY

https://https://www.youtube.com/watch?v=BlKP35bct2o - Microorganism in food

9. ATTITUDE AND PERSONALITY REQUIREMENTS

https://www.youtube.com/watch?v=Le3dW7iCN90 – Body Language experts.

https://www.4hoteliers.com/features/article/4580 - Understanding body language – Lesson for hospitality managers

https://www.youtube.com/watch?v=pwmhl6rzvpm-Learn how to manage people and be a better leader

https://www.youtube.com/watch?v=7e-cwdnsiow-- a.p.j.abdul kalam inspirational lessons for life time- how to manage failure and success

https://www.youtube.com/watch?v=l_-obnk12-4---Talking about your personality- Ambivert/ Extravert / Introvert

https://www.youtube.com/watch?v=njmfnto3qga - Top 10 hotel management tips for mam-nagersin the hospitality industry

https://mail.google.com/mail/u/0/#inbox/1617fa60afe4444e?projector=1-- Element of competency

Glossary

R9SE83

S.NO	WORD	MEANING
1.	Aerobic	ஆக்ஸிஜன் இருக்கும் நிலை
2.	Ambience	ஓரிடத்தின் சூழல் மற்றும் தன்மை
3.	Anaerobic	ஆக்ஸிஜன் இல்லாமல் இருப்பது
4.	Antioxidants	ஆக்ஸிஜனேற்றம் அடையாமல் தடுக்கக்கூடிய பொருட்கள்
5.	Asepsis	நுண்ணுயிரிகள் இல்லாமல் இருப்பது
6.	A'la Carte	பிரென்ச் வார்த்தை – உணவுபட்டியலின் படி
7.	Bactericidal	பேக்டீரியாவை அழிப்பது
8.	Bacteriostatic	பேக்டீரியாவின் வளர்ச்சியைத் தடுப்பது
9.	Bain marie	உணவுவகைகளை சூடாக வைத்திருக்க உதவும் சுடுநீர் பாத்திரம்
10.	Banquet	அதிக நபர்களுக்கான விருந்து
12.	Beverage	நீரைத் தவிர மற்ற பானங்கள்
13.	Blanching	நொதிகளை செயலிழக்கச் செய்யும் ஒரு உணவு தயாரிக்கும் முறை
14.	Blemishes	நிறமாற்றம்
15.	Bruises	சிதைவு
16.	Brunoise	மிகச்சிறியதாக வெட்டுதல்
17.	Canning	நுண்ணுயிரிகளை அழிப்பதற்கான வெப்பநிலையில் உணவு வெப்பப்படுத்தப்பட்டு காற்றுப்புகாவண்ணம் பாட்டில்களில் அடைத்து வைப்பது

S.NO	WORD	MEANING
18.	Chaat	வட இந்தியாவின் சிற்றுண்டி உணவு (எ.கா) பானிபூரி
19.	Chafing dish	உணவு வழங்கும்போது அதனை சூடாக வைத்திருக்க உதவும் பாத்திரம்
20.	Chef	தொழில் ரீதியான சமையல்காரர் / ஒரு உணவகத்தின் தலைமை சமையல்காரர்
21.	Chop	ஒன்றிரண்டாக வெட்டுவது
22.	Concasser	ஒரு குறிப்பிட்ட வடிவம் இல்லாமல் வெட்டுவது
23.	Contamination	தூய்மைக்கேடு
24.	Coquina	லத்தீன் வார்த்தை – சமைப்பதற்காக
25.	Courtesy	மரியாதை / உபசரித்தல்
26.	Cuisine	உணவு வகைகள்
27.	Denature	இயற்கைத் தன்மையில் மாற்றம்
28.	Dhal Makhani	உளுந்து, சிவப்பு பீன்ஸ், வெண்ணெய் மற்றும் கிரீம் சேர்த்து தயாரிக்கப்பட்ட உணவு
29.	Dhokla	அரிசி மற்றும் உடைத்த கொண்டைக் கடலையிலிருந்து தயாரிக்கப்பட்ட உணவு
30.	Dicing	கனசதுரமாக வெட்டுதல்
31.	Dollies	உணவுவகைகளை ஓரிடத்திலிருந்து மற்றொரு இடத்திற்கு எடுத்துச் செல்ல உதவுபவை
32.	Du jour	பிரெஞ்ச் வார்த்தை –(According to the menu) ஒரு உணவகத்தில் அன்றையநாளில் வழங்கப்படும் உணவுவகை
33.	Entrepreneur	தொழில் முனைவோர்
34.	Entrée	பரிமாறும் வரிசையில் பிரதான உணவு
35.	Etiquette	பண்பாடு
36.	Exhausting	வாயுக்களை வெளியேற்றும் செயல்
37.	Fluctuations	தொடர்ச்சியாக அல்லாமல் அடிக்கடி மாற்றம் ஏற்படுதல்

S.NO	WORD	MEANING
38.	Food Corporation of India	இந்திய உணவு கழகம்
39.	Food preservation	உணவு கெடாமல் பாதுகாக்கும் முறை
40.	Hospitality	விருந்தோம்பல் / விருந்தினரின் அடிப்படைத் தேவைகளான உணவு, பானங்கள் வழங்குதல் மற்றும் இருப்பிடம் தொடர்பாக வரவேற்பு அளித்தல்
41.	Hot holding cabinet	உணவினை சூடாக வைத்திருப்பவை
42.	Julienne	சாலட் மற்றும் நூடுல்ஸ் தயாரித்தலின் போது நேர்த்தியாகவும், நீளமாகவும் ஒரே சீராக வெட்டுதல்
43.	Kefir and Liben	புளிக்கவைக்கப்பட்ட ஆட்டுப்பால்
44.	Kulchas	புளிக்கவைத்து ஊறவைக்கப்பட்ட மாவிலிருந்து செய்யப்பட்ட ரொட்டி
45.	Kumiss	புளிக்க வைக்கப்பட்ட குதிரைபால்
46.	Lactometer	பாலின் தரத்தினை அறிய உதவும் கருவி
47.	Lounge	ஓய்விடம்
48.	Maillard Reaction	அமினோ அமிலங்கள் மற்றும் எளிமையான சர்க்கரையோடு வேதிவினை புரிந்து மணம் மற்றும் நிறமாற்றம் அடையும் போது உணவிற்கு பிரத்யேக மணம் ஏற்படும்.
49.	Meringue	முட்டையின் வெள்ளைக்கருவுடன் சர்க்கரை சேர்க்கப்பட்டு மிருதுவான அடுமனை உணவு வகை தயாரிக்கப்படுகிறது.
50.	Mince	பொடிப் பொடியாக நறுக்குதல்
51.	Mutter paneer	பட்டாணி மற்றும் பன்னீரிலிருந்து தயாரிக்கப்பட்ட உணவு
52.	Naan	களிமண் தந்தூர் அடுப்பில் சுடப்பட்ட ரொட்டி
53.	Non-perishable	நீண்ட நாட்களுக்கு கெடாமல் இருப்பவை
54.	Norcotics	மனநிலை அல்லது நடத்தையை பாதிக்கும் ஒரு சட்டவிரோத போதை மருந்து

S.NO	WORD	MEANING
55.	Palatability	சுவையில் ஏற்புத்தன்மை
56.	Pasteurisation	நோய் உருவாக்கும் நுண்ணுயிரிகளை வெப்பம் (Steam under pressure) மூலம் பால் போன்ற உணவுகளைப்பாதுகாக்கும் முறை
57.	Perishable	எளிதாக அழுகக்கூடிய உணவுகள்
58.	Putrid	மாமிசம் போன்ற அசைவ உணவுகள் கெடும்போது உண்டாகும் நாற்றம்
59.	Rancidity	கொழுப்பு சார்ந்த உணவுகளான எண்ணெய் மற்றும் கொழுப்பு கெட்டுப் போதல்
60.	Range	பலவிதமான சமையல் செய்ய உதவும் அடுப்பு
61.	Semi-perishable	சில நாட்களுக்கு மட்டும் கெடாமல் இருக்கக்கூடியவை
62.	Shelf life	உணவு தரத்தினை நீண்டகாலம் பாதுகாத்தல்
63.	Shred	சன்னமாக, நீளமாக வெட்டுதல்
64.	Solanine	பச்சை உருளைக்கிழங்கு மற்றும் அதைச்சார்ந்த தாவரங்களில் இருக்கக்கூடிய விஷத்தன்மை வாய்ந்த பொருள்
65.	Sterilisation	வெப்பப்படுத்துதல் மூலம் உணவு கெடுவதற்கு காரணமான நுண்ணுயிரிகளை அழிப்பது
66.	Stuffed paratha	பல்வேறு விதமான சைவ மற்றும் அசைவ மசாலாக்களை நிரப்பி சுடப்பட்ட கோதுமை/ மைதா ரொட்டி.
67.	Table d'hote	பிரென்ச் வார்த்தை – விருந்தளிப்பவரின் மேஜை
68.	Thermometer	வெப்பத்தை அளக்க உதவும் கருவி
69.	Toxin	குறிப்பிட்ட பாக்டீரியா போன்ற நுண்ணுயிரியால் வெளிப்படும் விஷம்
70.	Transit	ஓரிடத்திலிருந்து மற்றொரு இடத்திற்கு செல்லும்வழி
71.	Transluscent	ஒளி ஊடுருவும் தன்மை
72.	Trolleys	உணவுவகைகளை ஓரிடத்திலிருந்து மற்றொரு இடத்திற்கு எடுத்துச் செல்ல உதவும் வண்டி
73.	Viscous	பிசு பிசுப்பு

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