
UNIT: 1

PROFESSIONAL KITCHEN AND COOKING

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1.0 Introduction

The organization of kitchens will vary, mainly due to the size and the type of the establishment. Obviously, where a kitchen has hundred Chefs preparing for banquets for up to 1000 people and a lunch and dinner service for 300-400 customers with a la carte menu, the organization will be quite different from a small restaurant doing thirty table d'hote lunches or a hospital diet kitchen preparing diets. Even when there are two kitchens of a similar nature, the internal organization may vary as each Chef de Cuisine will have his own way of running his kitchen. It has been found most satisfactory in organizing the work of a kitchen to divide it into "Parties" or "Corners". The parties system was perfected by Escoffier and it was the result of studying about the food production and the recipes allocating tasks to different specialists so as to help produce the more complex dishes regularly, efficiently and swiftly. The kitchen was divided into sections, each one of which was responsible for a particular contribution to the entire food production system. In the kind of kitchen Escoffier organized, the parties system reached the height of complexity because the end-products had to be of the highest finish and yet be completed to order in rapid sequence for a substantial number of customers. A set pattern was made. Basically the principles of kitchen organization represent a standard practice though there are no set rules for deciding how many sections and how many staff a particular kitchen requires. Each catering establishment has different factors to be taken into consideration such as extent of menu, number of persons to be served and management policy.

A large kitchen, which caters for a large number, will have more sections than a smaller kitchen catering for lesser numbers. The number of staff in a section is determined by the amount of work to be done and importance of the contribution of the section to the menus and the skill of work. The base of different kitchen organizations is taken from the Traditional Kitchen Organization that was pioneered by Auguste Escoffier, the instigator of the partie or corner system. He had many sections such as grill, roast, vegetable, fish, sauce, soup, larder, patisseries etc. As everything was done manually it was necessary but now the sections have become fewer, because of labour-saving machines, convenience foods and combined catering equipment (microwave cum convection ovens, etc.), and the changing of public taste, which seeks simpler menus and meals.

Latest trends are that the kitchen organizations vary with almost every establishment. In former times there were specialized large staffs called brigades. The various sections were being clubbed together to suit the establishments. Many kitchens use fresh food, ready to cook and sometimes ready to serve. This speeds the preparation and cooking times. The kitchens have become smaller and cook more versatile. New establishments employ less cooks.

1.1 Objectives

After reading this unit learner will be able to understand the following:

- The rationale behind kitchen organization
- The Classical Kitchen Brigade
- Modern Kitchen Organization
- Sections of Kitchen
- Layout of Kitchen

1.3 Hygiene in Kitchen

The use of premises which are clean and can be correctly maintained is essential for the preparation, cooking and service of food. Cross contamination risks should be minimized by provision of separate preparation areas for the various raw and cooked foods. The table describes the various fittings and fixtures that are needed to be considered in a kitchen before the main equipment is planned.

1.3.1 Personal Hygiene

It is required that good hygiene systems are followed by all food handlers.

- Have a shower at least once a day.
- Always change the clothes you wear every day.
- Never wear jewellery or timepieces during the working hours.
- Have short trimmed hair. Women chefs are to cover their hair with nets
- Shave even if there is a slight growth of facial hair
- Keep your fingernails short and clean
- Wear shoes that cover the whole foot not thongs or sandals to prevent accidents in the kitchen.
- Wear clean, neat clothing that is not damaged or exposed to the skin and covers arms and legs to help prevent injury if there is an accident.
- Always use clean utensils and never use utensils that have been used for raw food with cooked food.
- Do not smoke near or around food preparation area.
- Smoking is strictly prohibited at working area.
- Always wear clean and sanitized protective clothing like chef coat, hat, apron trousers etc. while working in kitchen.
- Wash your hands in between jobs with luke warm water and detergent. Pat it dry
- See a doctor at least once a month to ensure you are disease free.
- Tasting food whilst cooking
 - Use disposable spoons for tasting food.
 - Food should never be tasted using fingers, as it just like spitting into the food
 - Food handlers should never chew gums, eat sweets, or touch their mouth and nose while cooking.

1.3.2 Kitchen Hygiene

- **Floors** - Should be durable, non-slip and non-permeable.

- **Walls** - Ceramic wall tiles were considered the best surface for areas where liquids splash a wall surface, potentially overcoming a damp or hygienic problem.
- **Ventilation**- The requirement of a higher performance kitchen ventilation system for modern kitchen with hoods and canopy system is essential.
- **Lightening**- Good lighting is essential to avoid eye strain. Natural lights are best but where artificial lightening is used some thought should be given to the type used.
- **Ceiling**- White coloured to reflect light, smooth textured, without cracks is recommended.
- **Equipments**- should be easy to handle, without any sharp edges, noiseless, can be cleaned and maintained easily.

1.4 Protective Clothing

The uniform of kitchen personal is designed to protect the chef from burns, scalds and heat because they are surrounded with myriad articles that can harm them. A chef mostly uses knives, heavy pots and pans, gas stoves and the work area is hot, humid and floor may become slippery at times due to spillage of water and cooking liquids like gravies, oil etc. which eventually results in accidents. Keeping the operational area of chef in mind the uniform of chef is designed to protect them from open fire and heat of high pressure gas burners, spillage of hot liquids and endure hot and humid climate of kitchen. The uniform is also designed in order to mitigate the hygiene and sanitation risk. The chef uniform includes chef cap, scarf, chef coat, chef pant, apron and shoes. Along with chef uniform chef do need to carry kitchen duster which helps them to clean table top and protects them while handling hot pots.

Chef Cap: A person working in kitchen need to wear a cap to protect falling hair and contaminating food prepared by them. The chef caps are either made-up of paper or cloths. The paper chef cap is more hygienic as it is discarded after every use making it expansive where as cloth caps may be re-used after washing. Cloth chef caps should be made with cotton fabric as it is more fire resistant than synthetic fibbers.

Scarf: Chef Scarf is protective clothing for chef having many uses. This protective piece of cloth is worn around neck and soaks excessive sweating and prevents falling in cooked food. This is triangular in shape and may be used as elbow support in case of accidents and may be used as tunicate to prevent bleeding.

Chef Coat: The fabric of Chef Coat should be a good absorbent and insulating in property. Cotton is the most suitable material for chef coats. This fabric is important because it acts as insulation against the intense heat from stoves and ovens. The cloth is thick enough to prevent the chef from being scalded by hot liquids or spattering hot oil and thermal shocks as the chefs constantly shuttles between the cold storage areas and the hot kitchen areas. Since there are two rows of buttons, the chef can re-button the double-breasted jacket to change sides whenever a side gets soiled during the course of work during a shift.

Chef Pant: Generally the chef either uses a black trousers or black and white check pants.

Apron: Apron has dual function to perform, one is the protection of chef coat from stains and secondly the protective function i.e. protecting from the burns and scalds from spillage of boiling liquids in kitchen.

Shoes: The shoes again are a protective gear. It protects feet from fall of boiling liquids and sudden falling of sharp tools like knife etc. The shoes should be black and well polished. To prevent slipping the sole should be made of rubber. Black socks a standard in our kitchens.

1.5 Hierarchy of Kitchen Department

The purpose of kitchen organization is to assign or allocate tasks so they can be done efficiently and properly and so all workers know what their responsibilities are. The way a kitchen is organized depends on following factors:

1. **The Menu:** The kinds of dishes to be produced obviously determine the jobs that must be done. The menu is, in fact, the basis of the entire operation.
2. **The Type of Establishment :** The major types of food-service establishments are as follows:
 - a. Hotels
 - b. Institutional kitchens Schools Hospitals, nursing homes, and other health care institutions and executive dining rooms Airline catering Military food service institutions
 - c. Private clubs
 - d. Catering and banquet services
 - e. Fast-food restaurants
 - f. Carry-out or take-out food facilities, including supermarkets
 - g. Full-service restaurants
3. The size of the operation (the number of customers and the volume of food served)
4. The physical facilities, including the equipment in use
5. As you can see, only a large establishment needs a staff like the classical brigade just described. In fact, some large hotels have even larger staffs, with other positions such as separate day and night sous chefs, assistant chef, banquet chef, butcher, baker, and so on. Most modern operations, on the other hand, are smaller than this. The size of the classical brigade may be reduced simply by combining two or more positions where the workload allows it. For example, the second cook may combine the duties of the sauce cook, fish cook, soup cook, and vegetable cook. A typical medium-size operation may employ a chef, a second cook, a broiler cook, a pantry cook, and a few cooks' helpers.
6. A working chef is in charge of operations not large enough to have an executive chef. In addition to being in charge of the kitchen, the working chef

also handles one of the production stations. For example, he or she may handle the sauté station, plate foods during service, and help on other stations when needed. Small kitchens may have only a chef, one or two cooks, and perhaps one or two assistants to handle simple jobs such as washing and peeling vegetables. Cooks who prepare or finish hot à la carte items during service in a restaurant may be known as line cooks. Line cooks are said to be on the hot line, or simply on the line. In many small operations, the short-order cook is the backbone of the kitchen during service time. This cook may handle the broiler, deep fryer, griddle, sandwich production, and even some sautéed items. In other words, the short-order cook's responsibility is the preparation of foods that are quickly prepared to order. One special type of short-order cook is the breakfast cook. This worker is skilled at quickly and efficiently turning out egg dishes and other breakfast items to order. By contrast, establishments such as school cafeterias may do no cooking to order at all. Stations and assignments are based on the requirements of quantity preparation rather than cooking to order.

- The team of cooks and their assistants under the partie system is commonly called the KITCHEN BRIGADE. Specialists head the parties and with their assistants help produce complex dishes with great speed and efficiency. All the heads of the parties come under the control of the Chef de Cuisine (Head) aided by one or more sous chefs. In small establishments, head of the larder or sauce section acts as Sous Chef.

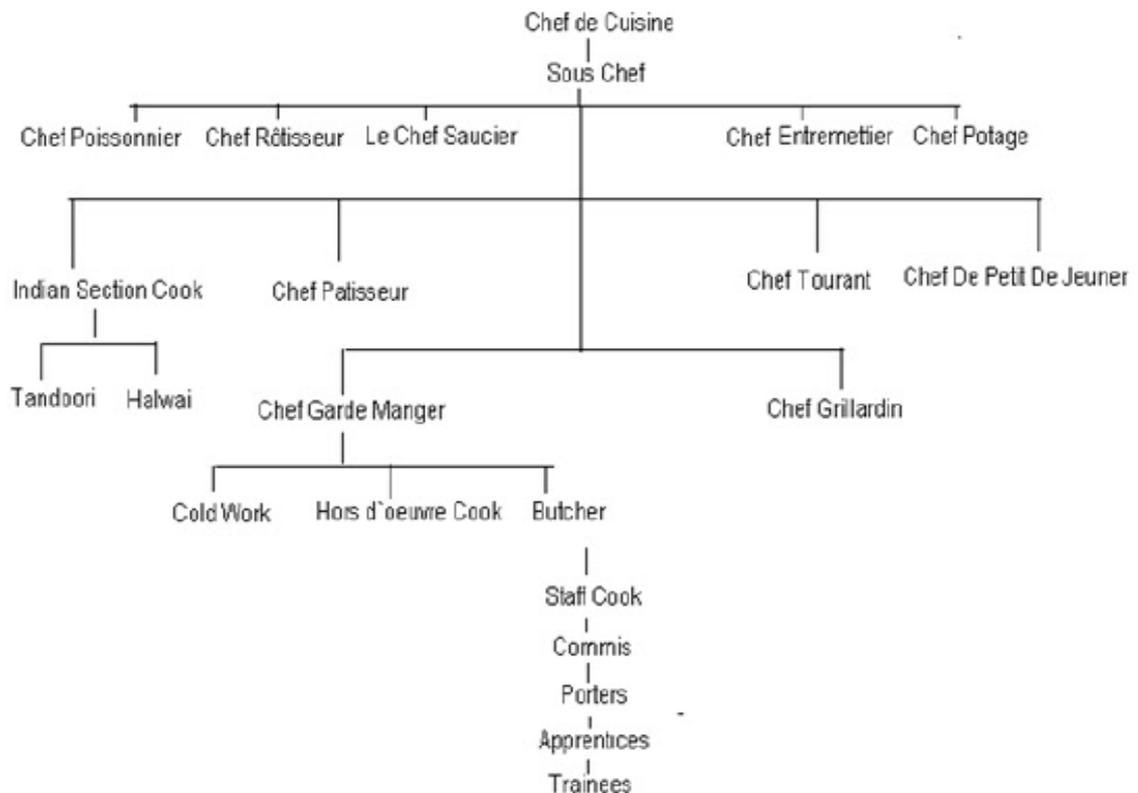


Figure 1.1 Kitchen Organization Chart

1.6 Classical Kitchen Brigade

One of Escoffier's important achievements was the reorganization of the kitchen. This reorganization divided the kitchen into departments, or stations, based on the kinds of foods produced. A station chef was placed in charge of each department. In a small operation, the station chef might be the only worker in the department. But in a large kitchen, each station chef might have several assistants. This system, with many variations, is still in use, especially in large hotels with traditional kinds of food service. The major positions are as follows:

- **The Chef** is the person in charge of the kitchen. In large establishments, this person has the title of executive chef. The executive chef is a manager who is responsible for all aspects of food production, including menu planning, purchasing, costing, planning work schedules, hiring, and training.
- If a food-service operation is large, with many departments (for example, a formal dining room, a casual dining room, and a catering department), or if it has several units in different locations, each kitchen may have a chef de cuisine. The chef de cuisine reports to the executive chef.
- **The Sous Chef** (soo shef) is directly in charge of production and works as the assistant to the executive chef or chef de cuisine. (The word sous are French for "under.") Because the executive chef's responsibilities may require a great deal of time in the office, the sous chef takes command of the actual production and the minute-by-minute supervision of the staff.
- **The Station Chefs, or Chefs de Partie**, are in charge of particular areas of production. The following are the most important station chefs.
- **The Sauce Chef, or Saucier** (so-see-ay), prepares sauces, stews, and hot hors d'oeuvres, and sautés foods to order. This is usually the highest position of all the stations.
- **The Fish Cook, or Poissonier** (pwah-so-nyay), prepares fish dishes. In some kitchens, this station is handled by the saucier.
- **The Vegetable Cook, or Entremetier** (awn-truh-met-yay), prepares vegetables, soups, starches, and eggs. Large kitchens may divide these duties among the vegetable cook, the fry cook, and the soup cook.
- **The Roast Cook, or Rôtisseur** (ro-tee-sur), prepares roasted and braised meats and their gravies and broils meats and other items to order. A large kitchen may have a separate broiler cook, or grillardin (gree-ar-dan), to handle the broiled items. The broiler cook may also prepare deep-fried meats and fish.
- **The Pantry Chef, or Garde Manger** (gard mawn-zhay), is responsible for cold foods, including salads and dressings, pâtés, cold hors d'oeuvres, and buffet items.

- **The Pastry Chef, or Pâtissier** (pa-tees-syay), prepares pastries and desserts.
- **The Relief Cook**, swing cook, or **Chef de Tournant** (toor-nawn), replaces other station heads.
- **The Expediter**, or **Aboyeur** (ah-bwa-yer), accepts orders from waiters and passes them on to the cooks on the line. The expediter also calls for orders to be finished and plated at the proper time and inspects each plate before passing it to the dining room staff. In many restaurants, this position is taken by the head chef or the sous chef.
- **Cooks and assistants** in each station or department help with the duties assigned to them. For example, the assistant vegetable cook may wash, peel, and trim vegetables. With experience, assistants may be promoted to station cooks and then to station chefs.

1.7 Sections of Kitchen

Hotel kitchen is divided into various sections for fast and efficient functioning of department. The various sections that may be found in hotel kitchen are as under:

- Larder Section
- Sauce Section
- Roast Section
- Fish Section
- Vegetable Section
- Soup Section
- Indian Section
- Pastry Section

1.7.1 Larder Section

The word larder has in professional kitchens a much wider significance. The larder is not simply a place where food is stored but a place where the raw materials for cooking are prepared and dressed. In large establishments, the work is further broken into sections. The larder is a room set aside for the storage of perishable foods, both raw and cooked, where food as meat, fish, poultry and game are prepared and made ready for cooking. In this department too, all cold items found on the menu, such as hors d'oeuvres, cold dish or meat dishes, cold salads, etc. are prepared and dressed.

For these function to be effective, it is essential that:

1. The room should be separate from the kitchen situated in a cool place. At the same time, it must be close to the kitchen to avoid undue running about between the two departments which are closely interrelated.
2. It should be suitably lighted, well-ventilated and sufficiently open to allow the staff to perform their duties in a clean and efficient manner.
3. It must be equipped with the necessary fittings, plant, machinery and tools in accordance with the volume, and or quality of the trade of the catering establishment in which it is situated.

1.7.2 Sauce Section

The sauce section is responsible for providing all meat, poultry, game and offal dishes with the exception of those that are plain roasted or grilled. All the meat dishes are cooked and garnished. The partie will also provide all basic and finished sauces served hot, that are normally required by the various parties in the kitchen. Normally, one first commences early duty to cover the preparations and cooking of dishes as "Plat de Jour" as these often require a cooking time of 3-4 hours. Braising, boiling, peeling is also done in this section. Similar to the fish partie an extensive part of the dishes are cooked and a variety of cooked garnishes are also prepared. Mise-en-place for banquets is also done here. The Chef Saucier does important work as he assembles dishes which have an impact on the customers.

1.7.3 Roast Section

The roast section is responsible for providing all roast dishes of meat, poultry and game. It is responsible for all grilled dishes of meat, chicken, offal and fish, and this duty is often delegated to the grill cook. The section is also responsible for the preparation of a number of dishes and the deep frying of the food items. It also prepares and finishes any savouries that are required.

1.7.4 Fish Section

This section is responsible for the provision of all fish dishes with the exception of those that are plain grilled or deep fried. The cleaning, de-scaling, filleting, crumbling is done by the fishmonger in larder. Generally as a larger selection of fish are offered, an extensive mise-en-place is required. At each service period, the following basic sauces are made ready for service: béchamel, white wine sauce, fish velouté, hollandaise and melted butter. Further, a number of garnishes are prepared in advance to a part cooked stage. By this arrangement, a variety of fish dishes particularly the poached and meuniere types can be done. Grilling is done by the grill cook or commis.

1.7.5 Vegetable Section

An entremet course in France was the responsibility of the entremet of vegetables, who skilfully prepared and cooked vegetables, which could be served as a separate course. An entremet was originally something sent to the table between the courses in France. During the period before service, each day various quantities of vegetables are prepared, cooked, refreshed and placed into refrigerator. Peeling, cleaning and trimming are done by semi-skilled workers. Limited quantities of certain potato dishes are cooked and finished to varying degrees, kept ready when service begins. Vegetable garnishes are prepared here and given to other sections. The cooking of eggs forms an important part of the work in this section particularly, omelettes of various types, e.g. plain, garnished, stuffed and flat round omelettes. Italian pastas but not noodles are also prepared in this section. Items like spaghetti, macaroni and rice may be sent to other sections for garnishes. The mise-en-place is carried out according to menu requirements. By this method, the vegetable cook and senior commis are able to cope with the finishing and serving of a vast amount of different dishes. Management of cooking vegetables well for large numbers calls for particular knowledge, skill and judgment and should never be entrusted to an unskilled and disinterested cook.

1.7.6 Soup Section

It is the responsibility of this section to prepare soups such as consommés, creams, velouté, purees, broths, bisques and many special international soups. All basic stocks are also prepared here. The cold soups are prepared and passed to the larder for service. The garnishes come from the larder and vegetable section.

1.7.7 Indian Section

This section is responsible for the preparation, of all Indian dishes. The work is subdivided into subsections such as: Indian (bread and rice, pulaos, biryanis, chappaties, puries, bhaturas, etc.), vegetables, (bhajees, curries), meat, (including eggs and fish), tandoor (seekh kababs, tandoor chicken, boti kababs), Indian sweets jalebis, rasgullas, rabri, etc.) Each day a variety of dishes are prepared according to menu requirements.

1.7.8 Pastry Section

The work of this section is normally separated from the main kitchen and is self-contained in the matter of cold storage. The function of this section is to prepare hot and cold sweets, for lunches, dinners and pastries for tea-time and other occasions. It also prepares pastes like short and puff pastry, frying batters for making noodles for supply to other corners of the kitchen. Sorbets and water-ice like items are made in pastry section. The service of ices and those sweets which are based upon ice-cream are prepared and assembled in Patisserie. They also include the sweet omelettes au surprise and soufflé surprise, Melbas, etc. The art of pastry includes work like colored sugars to make flower baskets and similar decorative centre pieces, work with fondant and icing sugar, gum pastes, fashioning of praline into decorative objects. Where hotels operate a bakery section, the responsibility is carried out by the master baker. Normally one commis will commence early duty each day to provide the mise-en-place required by the various sections. The section needs workers with skill, imagination and experience.

1.8 Kitchen Layouts

If you understand the basic principles of kitchen layout will help take much of the mystery out of the design process. The most basic layout principle is the work triangle. The work triangle is the line drawn from each of the three primary work stations in the kitchen - the food storage, cooktop, and sink. By drawing these lines, you can see the distance you'll walk to move to and from each area. The sum of the ideal triangle is supposed to be between 15 and 22 feet, putting each of the three appliances within two or three steps of one another. The three primary kitchen work stations which create the work triangle are:

1. Food storage - Your refrigerator and pantry are the major items here. Cabinetry like lazy susan or swing-out pantry units adds function and convenience. Options like wine racks, spice racks, and roll-out trays help to organize your groceries.

2. The preparation/cooking station - Your range, oven, microwave, and smaller appliances are found in this area. Counter space is important in this section. Conserve

space by moving appliances off the counter with appliance garage cabinets and space-saving ideas like towel rods and pot lid racks.

3. The clean-up station - Everyone's least favourite activity is one of the kitchen's most important - clean-up. This area is home to the sink, waste disposal, and dishwasher. Cabinetry for this station is designed to organize with the trash bin cabinet and roll-out tray baskets for storage convenience.

Triangle reloaded: The work triangle however is experiencing a remodel of its own. The work triangle was designed for an age when there was only one cook, and only three appliances (fridge, stove, sink). Here are a few top tips:

1. No leg of the triangle is supposed to be less than 4 feet or more than 9 feet.
2. There should be no human (well, or non human, of course) traffic flow cutting through the triangle.
3. Place the microwave near the refrigerator for convenience
4. Walk space should be 42-inch wide to account for traffic flow and clearance of large appliance doors or large relatives
5. Counter space on either side of the range or cook-top should be a minimum of 15 inches
6. An 18-inch counter should be adjacent to the fridge on the same side as the handle
7. The food prep area (minimum counter space 36 inches) is ideally located between the fridge and the sink; If the food prep area is between the sink and the range or cook-top, it will involve more travel.
8. A lower surface is best for food prep (measure 7 to 8 inches below your elbow height)
9. In two-cook kitchens, the fridge and range/cook-top are usually shared.
10. Two triangles can share a leg, but shouldn't overlap
11. An island with a second sink creates at least one more triangle, and adapts too many uses: wet bar location, flower cutting and arranging, homework station etc.

1.8.1 The Single Line (or Pullmann) Kitchen

This is a smart and simple solution for narrow rooms, ideally with one wall over 10 feet long, without windows or doors. However, this layout causes the longest journey distances since you often have to walk from one end of the room to the other. Therefore, it's a good idea to place the sink in the middle of the line, with adequate space separating it from the range:

1. Ideal for apartments and smaller homes
2. Works well with the open designs found in many contemporary homes
3. Small moveable table can provide eating space
4. Can be enhanced with the addition of an island

1.8.2 The Galley Kitchen

This shape offers the most efficient use of space, making it the choice of many professional chefs. The two rows allow room for lots of preparation space, and moving between activity areas can be as easy as turning around. However, this shape is not ideal if the corridor is open at both ends, since it can cause traffic congestion.

Make sure there is enough room for opposite drawers to be open at the same time (at least 48?). Another important consideration is to keep the cleaning and cooking areas on the same side in order to minimize the risk of accidents while moving hot pans between the sink and range.

1. Great for smaller kitchens
2. Appliances are close to one another
3. Easy for one cook to maneuver
4. Can easily convert to a U-Shape by closing off one end

1.8.3 The L-Shape Kitchen

This is a very popular kitchen layout - ideal for a family kitchen, or for entertaining guests, since it can easily accommodate table and chairs in the same room. Using two adjacent walls, the kitchen also benefits from the lack of through traffic. The sink, range and fridge should be separated by a preparation area.

1. Very flexible layout design
2. Major appliances can be placed in a variety of areas
3. Work areas are close to each other
4. Can easily convert to a U-Shape with a cabinet leg addition

1.8.4 The U-Shape Kitchen

The use of three full walls in a room offers the perfect working kitchen. The fridge, range and sink can be spaced out for maximum efficiency and convenience. This is great news for those who take your cooking seriously, as it provides the best workflows with the shortest distances around the kitchen. This shape also allows for large amounts of countertop and storage space.

1. Perfect for families who use their kitchens a great deal
2. Provides plenty of counter space
3. Efficient work triangle
4. Can convert one cabinet leg into a breakfast bar

1.8.5 The Island Kitchen

A very popular kitchen type, the island layout is perfect if you plan to entertain but requires more floor space. An independent island unit can face a dining or living area, allowing the cook to socialise while preparing. A sink here provides the optimal arrangement in terms of the kitchen's working triangle. Otherwise, a cook-top with a canopy over the island can form a stunning focal point to the kitchen.

1.8.6 The G-Shaped Kitchen

Built very much like the U-Shaped with the addition of an elongated partial wall, the G-Shaped kitchen offers a great deal of space.

1. Ideal for larger families needing extra storage space
2. Plenty of counter and cabinet space
3. Multiple cooks can function well in this layout
4. Can convert one cabinet leg into a breakfast bar or entertaining area

1.9 Duties & Responsibilities of Various Chefs in Kitchen

We presume that you are doing this course to acquire or enhance your knowledge about the modern management concepts and techniques. This understanding should, undoubtedly improve your skills as a manager, especially as a manager of people. You will also appreciate that an effective manager is one who is able to handle his or her people efficiently. In order to be a good manager of people, it will also be imperative for you to have an adequate understanding of the jobs assigned to them as also the relative job differentials in terms of their level of difficulty, responsibility, knowledge and skill. In this Unit, we shall be dealing with the concepts and techniques of job description of kitchen staff in hotel.

1.9.1 Job description

Job description is a broad statement of the purpose, duties and responsibilities of a job or position. A job description is based on a detailed job analysis and usually summarises the essential information gathered through job analysis. They describe the main tasks and responsibilities of the job clearly and concisely in order to facilitate the systematic comparison of jobs for evaluation purposes. The kind of information and amount of detail contained in the job descriptions depend on the job evaluation plan to be used. However, in all cases they must be standardised and use a uniform phraseology. If job characteristics are set out differently from one job to another, systematic comparisons are likely to be hampered and one of the main advantages of job evaluation will be lost right from the beginning.

Before we examine in detail the two cornerstones of job evaluation, viz., job analysis and job descriptions, we should mention a complementary means of describing jobs, namely by job specifications. These usually involve a listing of the personal qualifications regarded as necessary for satisfactory performance. Job specifications are mainly used in selecting and recruiting staff and are accordingly not essential to job evaluations. But certain personal attributes, such as experience, education and aptitude, may occur in both, the job description as well as the job specification. Many job evaluation plans accordingly use job specifications to complement job description. A primary output or result of job analysis is a job description. Information obtained by job analysis is shifted and recorded concisely, clearly and fully in the job description. The job description must assemble all the important elements of a job, such as essential tasks, responsibilities, qualifications required and the functional relation of the job to other jobs

1.9.2 Design of Job Description

There is no universally accepted standard format for job description for the reason that the form and structure of the job descriptions must depend on the kind of work being analysed and the job evaluation plan being used. For example, if the job evaluation plan comprises factors such as physical and intellectual effort, knowledge, skills, and responsibilities and working conditions, it follows that job description should be structured to reflect these factors so as to facilitate factor by factor comparison and evaluation of jobs. With non-analytical methods, job descriptions may be more flexible and simpler but must specify the title of the job and its position in the organisation, summarise the tasks performed and list the skills and abilities required. A complete job description should rightly contain three categories of information:

1. Job mission and location,
2. The work performed, and
3. The context in which the action takes place.

With non-analytical methods, job descriptions may be more flexible and simpler but must specify the title of the job and its position in the organisation, summarise the tasks performed and list the skills and abilities required. While writing a job description one should be brief, factual and precise as far as possible. It will be helpful to follow the following guidelines while writing a job description:

1. Always be accurate about what is expressed.
2. Omit expressions which are attributes - such as uninteresting, distasteful, etc.
3. Personal pronouns should be avoided - if it is necessary to refer to the employee, the work 'operator' or 'so and so executive' may be used.
4. Do not describe only one phase of the job and give the impression that all phases are covered.
5. Generalised or ambiguous expressions, such as 'prepare', 'assist', 'handle', etc., should be omitted unless supported by data that will clarify them.
6. All statements should be clearly and simply set down - promiscuous uses of adjectives only reflect one's own opinion.
7. Describe the job as is being done, by the majority of workers holding the designation.
8. Write in simple language - explain unusual technical terms.
9. Description of a job which is part of team-work, should establish the team relationship.
10. The length of description is immaterial, it is not expected even with printed forms that all job descriptions should be of equal length but write concisely.
11. When the job analyst finds that the data he or she has to work with is insufficient, he or she should stop until sufficient data is available.
12. Put the date of completion of each description and revise it as often as changes in jobs and occupation require.
13. Job description should have the concurrence of the concerned supervisor.
14. Description should contain the initials of the persons who compile them.

1.9.3 Uses of Job Description

Apart from being a basis for job evaluation, the job descriptions can be put to many uses. These are as under:

Supervisor - Employee Communication: The information contained in the Job Description outlines the work which the incumbent is expected to perform. Hence, it is an extremely useful document for both the supervisor and the subordinate for purposes of communication. Furthermore, it helps employees to understand just what work their associates are expected to perform, thus, facilitating integration of efforts at the work-site by the employees themselves. **Recruitment, Selection, Promotion, Transfer:** Information pertaining to the knowledge, skills and abilities required to perform the work to an acceptable standard, can be used as a sound basis on which to base standards and procedures for recruitment, selection, promotion and transfer.

Work Performance Appraisal: To be sound and objective, a performance appraisal system must be rooted in the work performed by the employees; such work is indicated by the duties in the job description. In such an approach, using each duty as the basis for discussion, the employee and the supervisor agree on work performance

- Identify and develop new products and equipment, to enhance the product quality.
- Develop and define quality standards of food preparation and presentation.
- Define the organization of work within the department including assignments, time schedules, and vacations of staff.
- Ensure the quality of food preparation and presentation, as per organizational standards.
- Ensure availability of stock and raw ingredients by proper planning and coordination with purchase and stores.
- Coordinate with the engineering department to carry out preventive maintenance programme in the kitchen.
- Establish recipes and methods of preparation, inform the F&B director of significant change in prices affecting the preparation of menu items.
- Recommend menu pricing in coordination with F&B director/F&B manager/F&B controller/banquet manager.
- Be responsible for the hygiene and cleanliness of the kitchen areas, equipment, and staff.
- Ensure compliance with company and hotel policies department employees.
- Constantly monitor key performance indicators for the department and take appropriate action.
- Analyse and monitor costs, (material, energy and staff) to ensure high profitability on a regular basis and initiate corrective action whenever necessary.
- Ensure that menus are changed on a regular basis, as per corporate guidelines and market needs, in coordination with F&B manager/F&B director.
- Ensure that the best quality of raw material is procured and used in food preparation.
- Prepare capital and operational budget in order to achieve desired profitability.
- Ensure storage of raw and cooked food/raw material as per international standards.
- Keep oneself updated with market knowledge and trends by conducting regular market surveys in coordination with the purchase department.
- Ensure department employees are fully trained through constant on-the-job training.
- Attend behavioural and vocational training in own and related work areas to enhance skills and develop multi-functionality.
- Ensure practice of hygiene and safety precautions as well as compliance with hotel and company policies by the kitchen staff through training.
- Provide career development and succession planning for subordinate through training.

1.9.6 Job Description of Sous Chef

A sous chef has to organize, develop, and supervise the food production in the main kitchen as per standards and recipes developed by the executive chef and to handle independently one of the satellite kitchens assigned to him/her. The specific responsibilities of a sous chef are to:

- Look after the function of the executive sous chef during his/her absence.

- Train staff on improved work procedures, quality food production, economical usage of food materials, and the attractive presentation of food items.
- Approve requisitions from stores for stations assigned and in the executive sous chef's absence for the entire main kitchen.
- Be responsible for all food production in area assigned to him.
- Be responsible for overall food cost control without affecting standards and specifications as laid out by top management.
- Account for the usage, consumption, spoilage, and control of food stuff produced or stored under his/her supervision.
- Be responsible for the preparation of mise en place at all stations.
- Attend the food and beverage meetings and departmental meetings.
- Maintain all attendance records.

1.9.7 Job Description of Pastry Chef

The pastry chef has to organize, develop, and supervise the pastry shop including stations such as bakery, pastry, and confectionery. The specific responsibilities of a pastry chef are to:

- Be responsible for the mise en place and food preparation for all bakery and pastry stations.
- Account for the usage, consumption, and control of all foods and equipments in the stations supervised by him/her.
- Train staff in his/her stations on improved word procedures, quality food production. The economical usage of food materials, and the attractive presentation of food items.
- Supervise and train the chef de parties, commis, and apprentices, and to review staff working in his/her department.
- Initiate performance reviews of staff working in his/her department.
- Attend the daily and weekly kitchen chef's meetings and the F&B meetings.
- Approve requisitions from stores for materials required in his/her stations.
- Recommend schedule changes and changes in personnel for adequate manning of all stations

1.9.8 Job Description of Kitchen Executive

A kitchen executive ensures that the food production team provides a consistent quality of F&B in the area/shift under his/her control, as per the corporate preset international standards, in order to maximize guest satisfaction and organizational profitability in an atmosphere of high employee morale. The specific responsibilities of a kitchen executive are to:

- Ensure adherence to organizational standards of food quality, hygiene, preparation, and presentation in his/her kitchen.
- Make sure all the kitchen equipment and machinery is in good working order at all times, in his/her kitchen.
- Recommend changes in systems and procedures to increase efficiency and improve service levels.
- Ensure prompt, courteous, and accurate service to all the guests to achieve high level of guest satisfaction.

- Be responsible for maintaining of records/documentation in his/her area as per operational/control requirements.
- Check the quality and availability of raw ingredients at all times for smooth operation.
- Provide timely follow-up on any sick team member and convey the report immediately to HR and executive chef.
- Ensure buffets/food displays are set up and maintained professionally, as per organizational standards.
- Be responsible for the hygiene standards of his/her kitchen, storage areas, equipment, and machinery.
- Control food wastage, without compromising on food quality.
- Check that cleaning schedules by kitchen stewarding department are being followed in timely manner.
- Ensure par level of dry stores and perishables are maintained on daily basis, and also ensure correct store requisitioning.
- Check attendance and punctuality of every team member.
- Provide functional assistance to all subordinates and peers of various areas.
- Ensure excellent relations and professionalism amongst all staff in his/her kitchen and with related departments and staff.
- Work in close coordination with F&B service team.
- Maintain appropriate and professional communication with F&B team at all given times, and for any special occasions.
- Provide constant on-the-job and classroom training for his/her kitchen employees.
- Personally conduct critical training sessions.
- Encourage team building through regular informal meetings and keep an open door policy.
- Coordinate functions and activities with other F&B section, engineering/housekeeping etc. whenever required.
- Assist sous chef with on-the-job training and class room training for his/her kitchen and related F&B employees.
- Attend behavioural, vocational, and skill-related training, to enhance his/her skills and develop multi-functionality.
- Provide cross training to employees of other department.
- Personally conduct critical training sessions.
- Provide constant on-the-job training and coaching to all the staff in the department.
- Share his/her skill and knowledge with all employees; follow the company standard operating procedures (SOP) in his/her kitchen.
- Counsel subordinates in work-related and personal matters.
- Attend behavioural training in own related work areas to enhance skills and develop multi-functionality.
- Maintain records as required of training in the department.

1.9.9 Job Description of Chef de Partie

A chef de partie assists his/her superior in maintaining the highest standards of quality in food preparation by following standard recipes and high level of hygiene standards maintained as per the hazard analysis and critical control points (HACCP) standards in

his/her area, in order to maximize guest satisfaction and profitability in an atmosphere of high employee morale. The specific responsibilities of a chef de partie are to:

- Ensure prompt and accurate service by all kitchen staff under his/her control, to all the customers to achieve a high level of customer satisfaction.
- Be responsible for implementing hotel standards on food quality, preparation, and presentation in his/her section/shift.
- Recommend changes in systems and procedures to increase efficiency and improve service levels.
- Recommend changes in menu at the time of new menu by introducing new dishes/presentation.
- Ensure that the hygiene and cleanliness of the kitchen area is maintained as per predetermined standards.
- Be responsible for controlling food wastage, without compromising on food quality.
- Ensure proper security and safety of raw and cooked food, and equipment by proper storage.
- Make sure that all the kitchen equipment is operated, maintained and stored properly and is safe to use.
- Check that all the kitchen records are maintained properly at all times.
- Ensure that organizational policies and standards are adhered to by all in the department.
- Ensure availability of ingredients in the kitchen, at all times, in order to provide a prompt service.
- Assist the chef de partie/sous chef in implementing standards set by executive chef on food quality, preparation, and presentation in his/her section.
- Assist the sous chef and higher authorities to define the organization of work within his/her kitchen department including assignments, time schedules, and vacations.
- Control food wastage without compromising on food quality.
- Check that inter-kitchen food transfers are accurate and conform to hotel policy.
- Ensure proper mise en place in his/her production sections for speedy preparation and service.
- Make sure that hygiene and cleanliness of the kitchen area/equipment is maintained as per predetermined HACCP standards.
- Discuss production planning with his/her commis, demi chef de partie, and concerned higher kitchen authorities.
- Ensure all the company SOPs are followed by all the team member.
- Make sure the cleaning schedules by kitchen stewarding department are being followed in timely manner.
- Ensure par level of dry stores and perishables are maintained on daily basis, and also ensure of correct store requisitioning.
- Receive daily requirement from storeroom and get it checked and duly signed by his/her senior kitchen executive.
- Recommend quality status on all the products in his/her kitchen to senior authority and rectify it as soon as possible.
- Register complaints regarding improper machinery functioning, or employee's ill behaviours to his/her kitchen executive.
- Brief his/her team members on menu changes or introduction of new ingredients/new dishes on the menu.

- Provide functional assistance to all subordinates and peers of various kitchens.
- Ensure excellent relations and professionalism amongst all staff in his/her kitchen and with related departments.
- Maintain appropriate and professional communication with all the team members at all given times.

1.9.10 Job Description of Demi-Chef de Partie

A demi chef de partie assists his/her superior in maintaining the highest standards of quality in food preparation by following standards receipts and high level of hygiene standards maintained as per the HACCP standards in his/her area, in order to maximize guest satisfaction and profitability in an atmosphere of high employee morale. The specific responsibilities of a demi chef de partie are to:

- Ensure prompt and accurate service by all kitchen staff under his/her control, to the entire guests to achieve high level of customer satisfaction.
- Assist the chef de partie in implementing standards set by executive chef on food quality, preparation, and presentation in his/her section.
- Assist the chef de partie to define the organization of work within his/her kitchen department including assignments, time schedules, and vacations.
- Control food wastage without compromising on food quality.
- Make sure that all the kitchen equipment is operated, maintained, and stored properly and is safe to use.
- Ensure all organizational policies and standards are adhered to by all in the department.
- Check that inter-kitchen food transfers are accurate and conform to hotel policy.
- Ensure proper mise en place in his/her production sections for speedy preparation and service.
- Make sure that hygiene and cleanliness of the kitchen area/equipment is maintained as per predetermined standards.
- Ensure all the kitchen records are maintained properly at all times as per organizational standards in his/her department.
- Discuss production planning with his/her commis and concerned higher kitchen authorities.
- Receive daily requirement from storeroom and get it checked and duly signed by his/her senior kitchen executive.
- Maintain daily log book and register equipment issues, and any critical information to be passed on to higher authority or next shift.
- Recommend quality status on all the products in his/her kitchen to senior authority.
- Register complaints regarding improper machinery functioning, or employee ill behaviour to his chef de partie or senior kitchen executive.
- Provide assistance to all subordinates and peers of various kitchens.
- Promote excellent relations and professionalism amongst all staff in his/her kitchen and with related departments.
- Coordinate with other food and beverage section, engineering/housekeeping, etc. whenever required.
- Ensure appropriate and professional communication with all the team members at and develop multi-functionality.

- Attend behavioural, vocational, and skill-related training, to enhance his/her skills and develop multi-functionality.
- Provide constant on-the-job training and coaching to subordinates.
- Share his/her skill and knowledge with all employees.

1.9.11 Job Description of Commis

A commis has to prepare and provide the highest quality food in his/her area by following standard recipes, and high level of hygiene standards maintained as per the HACCP standards, in order to maximize guest satisfaction and optimum profitability in an atmosphere of high individual morale. The specific responsibilities of a commis are to:

- Prepare food and provide prompt, courteous, and accurate service to all the customers as per organizational standards of quality, as directed.
- Control food wastage without compromising on food quality.
- Prepare all mise en place in production sections for smooth kitchen operation, as directed.
- Ensure hygiene and cleanliness of his/her area at all the times.
- Assist chef de partie in implementing and following organizational standards on food quality, preparation, and presentation.
- Be responsible for maintaining all kitchen equipment in his/her area in good working condition.
- Take responsibility for adherence to all organizational policies and procedures.
- Maintain complete hygiene in his/her work area and adhere to the HACCP standards.
- Ensure exact collection of perishables, grocery, and meat/fish items as per the storeroom requisition.
- Ensure timely cleaning and sanitization of all the equipment and tools in appropriate hygienic manner.
- Recommend daily requirement from store room to the demi chef de partie.
- Maintain daily log book and registering equipment issues, and any critical information to be passed on to higher authority or next shift.
- Recommend quality status on all the products in his/her kitchen to demi chef de partie.
- Provide assistance to all subordinates and peers of various kitchens.
- Promote excellent relations and professionalism amongst all staff in his/her kitchen and with related departments.
- Coordinate with other food and beverage section, engineering/housekeeping, etc. Whenever required.
- Ensure appropriate and professional communication with all the team members at all given times.
- Attend behavioural, vocational, and skill-related training, to enhance his/her skills and develop multi-functionality.

1.9.12 Job Description of Chef Garde Manger

The responsibilities of the Chef Garde-Manger, therefore, are many and varied. This person is responsible to the Chef for the efficient running of the Larder department and for the co-ordination of the work of its staff; for the training and discipline of larder staff; for the foodstuffs in the department, some of which may be stored in refrigerators or even in deep freeze, or preserved by other means. The Chef Garde-

Manger is responsible for keeping a record of such foodstuffs and a day-by-day record of issues to kitchen or other departments. The Chef Garde-Manger must study the menus in advance, so as to be able to order meat, fish, etc., in time for the foodstuff to be prepared and cleaned and made ready for the kitchen in time for it to be cooked; and also to order all necessary stores for the various larder productions such as salads, hors d'oeuvres, sauces, buffets, etc. The Larder Chef is responsible for the efficient storage of food to avoid deterioration and wastage and for cleanliness and hygiene in the department, to avoid any danger of contamination and possible food poisoning. He should also advise the Head Chef as to what foodstuff items require using to prevent eventual wastage.

LARDER CONTROL

If this department is to be run efficiently and economically, it is essential that the Chef Garde-Manger should exercise the strictest possible control over the foodstuffs received and stored in the department. This involves:

- Checking the quantity and quality of all goods delivered to the larder.
- Ensuring that all foodstuffs are stored at the right temperature and that they can be easily checked.
- Ensuring that the food is protected from contamination by vermin.
- Ensuring that portion control is rigidly carried out, e.g. a given weight of fish, poultry, meat, should always produce the required number of portions.
- Ensuring that food is not overstocked and stocks of food are regularly turned over.
- Making every effort to maintain the highest possible standard of hygiene and to prevent any deterioration in the foodstuffs under his control.
- Taking every precaution to discourage pilfering.
- Ensuring (and this is imperative) that a simple daily stock sheet be kept by each section within the Larder and handed to the Chef Garde-Manger at the end of each day's business to enable him to write out his order for the following day.

CHECK YOUR PROGRESS-II

Q.1 what are the duties of Executive chef?

Q.2 What are the duties of chef garde manger?

Q.3 Write job description of following:

- Commis

- Chef de partie

1.10 Attributes, Attitude and Etiquettes of Kitchen Personal

Every Industry has its own set of requirement from professionals working with it. Service Industry, especially hotel requires their staff to possess certain attributes that are prerequisite to perform well. Food & beverage professionals are expected to build upon the following attributes.

1.8.1 Physical Attributes

The physical attributes contains the proper personal hygiene and appearance. Since waiting staff deals with food, utmost cleanliness and good grooming is necessary at all times. This applies not only in high class hotels, but in every branch of catering however humble it may be. Guest are not likely to return to an establishment where staff does not maintain proper hygiene and grooming. There are times when food & beverage professionals are required to work overtime. Lifting and carrying service equipment also requires staff to be physically fit.

- **Hair:** - Hair should be kept healthy, trimmed and avoid dandruff. Hair should never fall over the eyes. Waitresses may adopt neat hair styles and particularly ensure a hair length which does not fall on to or below the collar or lengthy hair should be combed and tied neatly and properly.

- **Bath:** - Bath everyday, without fail, before coming to shift.
- **Face:** - Males should shave everyday, before coming to shift. Moustache, if kept must be neatly trimmed. Do not use strong aftershave. Ladies should wear only light make-up. Do not use heavy perfumes.
- **Teeth:-** Teeth and a clean mouth are vital, both for appearance and a wholesome breath. Brush your teeth immediately before coming to duty. Do not eat onion, garlic or smoke before your shift. If you smoke, use mouthwash.
- **Hands:-** Always wash hands with soap before coming on shift keep your nails short and clean. Hands must always be clean, free of any stains and skin breaks. Always wash hands with soap, immediately after using toilets, eating, smoking or handling refuse.
- **Uniform:-** Uniform should always be clean, laundered and ironed. Change uniform whenever it is visibly soiled. Change socks and undergarments everyday. Always carry a handkerchief and change it daily. Uniform must be worn only on duty and not for personal use.
- **Feet:-** Feet need care, both for comfort and cleanliness. Keep toe nails trim and feet well washed. Corns and other painful blemishes may require treatment by a chiropodist disease. For more severe foot weakness medical advice should be sought. Socks or stockings should be changed and washed daily.
- **Shoes:-** Wear comfortable closed toed shoes. Air your shoes. Waitresses should avoid excessively high and pointed heels and shoes should be daily polished.
- **Cuts and burns:-** cuts and burns must be covered with correct dressing.
- **Illness:-** Inform your supervisor, if you suffer from:-
 - Fever
 - Diarrhoea
 - Upset stomach, nausea or vomiting
 - Sore throat or sinus infection
 - Coughing or sneezing
 - Conjunctivitis

It is better to have regular hours of sleep under good conditions rather than long irregular hours of sleep. Exercise is very essential for normal growth and development of the body and the perfect maintenance of health.

- **Posture:-** Good stance is also important for the appearance comfort and efficiency of waiting staff. To stand upright and walk erect is to give a good impression to guests and also to avoid the bodily stresses that accompany slouching. Waitresses who require support garments are advised to choose sound quality and proper fitting ones to aid posture and health as well as comfort and appearance.

1.8.2 Work Related Attributes

The following qualities which a waiter should cultivate or how should behave, are in no particular order of importance.

- **Knowledge of food & beverages and technical ability:** The staff must have sufficient knowledge of all the items on the menu and wine drinks lists 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. For beverage service the staff should know how to serve various types of wine and drink, in the correct glass and at the right temperature.
- **Communication skills:** Language plays an important part in understanding the requirements of international travelers and delivery them. Food and beverage professionals must keep improving their communication skills in English. Talking to guest in their own language instead of just English is very effective and builds good relationship.
- **Punctuality:** Punctuality is very important. If a waiter is continuously late on duty, it shows lack of interest in his work and lack of respect for the management. The waiter should report on duty before the service is due to commence so that he may check his station, side board and have complete knowledge of the menu. Remember early start is a good start.
- **Local knowledge:** In the interest of customers the staff should have a certain knowledge of the local area in which they work so that they may be able to advise the guests on the various forms of establishment offered, the best means of transport to places of interest so on. The staff should know about the historical places of the city and how far are the Airport, Bus Terminal/Station, Cinema halls, commercial complexes, Railway Station etc.
- **Team Work:** All sections of a hotel work towards understanding the guest requirements and delivering them to perfection. This can only be achieved through co-ordination and co-operation. In its daily operations food & beverage department needs support of kitchen, housekeeping, front office, maintenance, laundry, purchase and receiving, personnel and various external suppliers. It is necessary that the wait staff have the ability to get along with everyone. They must help colleagues to perform better in their jobs and complete work as a team to satisfy customers.
- **Sense of Urgency:** It is very important to increase seat turnover and revenue during business hours. Slow service will lead to low seat turnover and lower revenue. The wait staff should be quick in getting food from kitchen, serving dish, presenting bill when completed and re-laying cover for the next arrival. All these must be done, quickly and effectively, without running around and shouting.
- **Honesty:** This is very important for the waiter in his dealing with both the customer in his dealing with both the customer and the management. There is trust and respect in the triangle of waiter/ customer/management relationships,

then there will be an atmosphere for work which encourages efficiency and a good team spirit amongst the food and service operations. The staff should remember that an increase in sale/profit will result in an increase in his remunerations. Honesty is of Paramount importance as it reflects the character of a person. The service staff may be tempted to eat guests' food, steal establishment's and guests' property, tell lies to his colleagues and guests, pass on vital information to competitors and so on.

- **Memory:** Good memory is an essential asset for service staff. They should be able to remember who has ordered what, who is sitting in which table number, which room number a guest is staying in, the likes and dislikes of guests, where they like to sit, what type of food they prefer, what types of drinks they take, smoker or non-smoker, name of guests and so on.
- **Maximize revenue:** Cutting down on costs and maximizing the revenue of the establishment should be of prime importance of all members of the staff, even those in junior positions.
- **Observation:** A keen sense of observation and an eye for details will help a member of the staff to be more efficient at his job. An ability to correctly judge people is definitely an advantage. A sense of anticipation in the service industry is an invaluable quality. The ability to anticipate what a guest or the management needs, even before it is asked creates a very good impression.
- **Ability to assume responsibility:** All service staff should be able to cope with the demands of the job and possess the ability to assume responsibility. They should be loyal to their employers, responsible to the guest and friendly towards their fellow workers.
- **Personality:** The staff should be diplomatic tactful, courteous, even tempered and not controlled by emotions. During service, wait staff comes across various challenging and demanding situations that should be handled diplomatically, satisfying both customers and management.
- **Courtesy:** It is the hallmark of a good waiter to be courteous on all occasions. Indeed, a waiter must often go out of his way to be considerate to or fore bearing to a critical or ill-tempered person. He will certainly be courteous to customers, but should also carry these good manners through to the service room and the locker room. His manners should not be just a part of the 'technique of the restaurant', but inherent in his nature and a sign of well-bred desire to please those with whom he comes into contact. The aim is to be friendly without being familiar.
- **Complaints:** Staff should have a pleasant manner and show courtesy and tact, an even temper and good humor. 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 calm the guest and put right any fault. Remember, loss of time in dealing with complaints only makes the situation worse.

1.8.3 Attitude of Kitchen Staff

Attitude is related to the way people behave in the workplace. This is critically important in the intensive service context of the hotel industry. Attitude is defined as ‘A mental states of readiness, learned and organized through experience, exerting a specific influence and person’s response to people, objects and situations with which it is related’. Attitude shape the way the world is viewed and how people organize themselves in response to external stimuli. It has been used to refer to our emotional orientation, even feelings, towards things as shaped by our opinion. While our attitudes have a major influence on our behaviour, particularly in hotel industry, a variety of other factors have a major impact on the development of our attitudes. Generally, they are learned both from our own experiences and the general socialization process wherein we tend to adopt the views and perspectives of the important people in our life such as parents, peers and customers. Recent research has further indicated that how we develop these attitudes can also be a function of our personality and psychological type which in turn are a function of our genetic composition. This is particularly the case with how we acquire and interpret information and then express our understanding of that information in our behaviours. Personality is bi-product of heredity & Environment.

Some people have an inherent and natural ability to see things in a broad context, others are more adept at seeing things in fine, highly specific, detail. Given that one’s perception is one’s reality, this can lead to people developing attitudes which may reflect a broad understanding of the wider context, while other may prefer to see things in terms of specific details. In a similar fashion, some people have an inherent and pervading desire to express themselves in a very structured, logical and pragmatic fashion. In contrast, others may have a preference to express themselves in a fashion which is reflective of a desire for harmony and comfort rather than logic and order.

The ongoing debate about the role and impact of genetics (Nature) and socialization (Nature) on our attitudes, behaviour, and reasoned action will provide further insight and understanding of why we work and deal with ourselves and others in the way that we do. However, at this stage, we have sufficient understanding of these functions to identify their consequences for our work, particularly in the hospitality industry. In hospitality, this self awareness and discipline can be of considerable advantage. Hospitality work tends to involve long hours with bursts of intense activity driven by a combination of production and customer interaction pressures. While some people are considered “naturals” in this environment, others, who still have commitments to hospitality, may struggle to cope in this environment, and consequently find themselves under achieving in the industry. However, if these people are able to recognize that their actions and behaviour in these situations are a function of their attitudes, which are in turn a function of their socialization and genetic make up they can embark upon a program to modify their attitudes by way of “re learning” and adjusting their attitudes toward the situation. In turn, they can also develop specific

strategies to help them deal with the stresses and pressure that challenge their effectiveness in the workplace.

While it is clearly not possible to alter our genetic make up at this stage, it is possible to alter our attitudes and thus behaviour and reasoned action. We can do this by firstly, thinking about our actions and planning them and fundamentally by thinking about why we behave the way we do and why we have the attitudes that we have. By applying ourselves to developing new ways of interpreting information and considering other perspectives, our new found attitude may lead us to engage in new form of behavior and finally, a more considered and thoughtful approach to pursuing our goals can lead to change in our planned actions. The attitude of a person determines whether he is successful or is a failure. Positive attitude towards guests will make the service staff successful in their career.

1.8.4 Etiquette of Kitchen Staff

Guest observes more than grooming and appearance. They observe how staff members carry themselves. Therefore the hotel staffs needs to know about etiquette and practice them.

While standing

- While standing to take an order or standing at the restaurant door, stand erect at ease, but not in a casual manner.
 - Weight balanced
 - Shoulders straight
 - Chest out
 - Stomach in
 - Keep your hands on the sides or behind your back.
 - Do not keep your hands in the pockets or on the hips.
 - Do not cross your arms across the chest.
- Do not lean against the sideboard, panels or the reservation desk/Maitre D's desk.
- Remember, you may be in view of a guest even when you are not directly interacting with him/her. Maintain your poise at all times.
- Do not huddle together in bunches inside the restaurant. There is always something to be done in your area, even when the guests are not there.

While walking

- Walk at an even pace inside the restaurant, avoiding any sound of the footsteps.
- Never run inside the restaurant
- While walking in guest area. If guest are approaching, get aside and give them First right of way.
- If near a door, open the door for the guests to pass through
- Walk on the left hand side
- If accompanying a guest, walk on his/her right hand side and open the door for the guest.
- Walk erect and maintain the poise

1.11 Coordination of Kitchen with Other Departments

Coordination terms and models have been developed in different fields to coordinate the interaction among components and objects, and are nowadays used to model and analyse organizations too; moreover, organizational concepts are used to enrich the existing coordination languages and models (Boella & van der Torre 2006). Most modern day organizations are characterised by complexities; organizational performance has become one central issue in this regard, this has made experts to think about ways to tackle these myriad of problem through innovative theories and perspectives (Gilliland, Steiner, & Skarlicki 2007). Hotel managers are faced with the need to group certain jobs in order to ensure efficient coordination and control of activities. These job groupings are usually called departments. This common method of organizing a hotel or a lodging business is the functional organization. In a very small lodging business, such as bed-and breakfast, the owner can supervise each department. However, as the lodging business increases in size, it is effective to create a managerial position within departments (Stutts,Wortman, 2006).

The kitchen department should coordinate with various departments for efficient and flawless functioning. To ensure proper day to day function kitchen should coordinate with:

- Front Office for knowing the number of the resident guests.
- Banquets for knowing about the functions and menu of the same.
- Restaurants for knowing the guest orders.
- Maintenance department for upkeep of equipments and machines used in kitchen.
- Housekeeping department for scheduled cleaning of the area.
- Security department for dealing any security issue.

1.12 Summary

Traditional Kitchen Organization that was pioneered by Auguste Escoffier, the instigator of the *partie* or corner system. He had many sections such as grill, roast, vegetable, fish, sauce, soup, larder, *pâtisseries* etc. As everything was done manually it was necessary but now the sections have become fewer, because of labour-saving machines, convenience foods and combined catering equipment (microwave cum convection ovens, etc.), and the changing of public taste, which seeks simpler menus and meals. The various layout of kitchen is been discussed in the unit.

Jobs are subjected to analysis to find out precisely what the duties, responsibilities, working environment and other requirements of a job are and to present these in a clear, concise and systematic way. The information gathered through job analysis can be used for a wide range of personnel and general management decisions. Job analysis is also a prerequisite to preparing job descriptions. In fact, job descriptions summarise the essential information gathered through job analysis. The various concepts and methods discussed in this Unit are useful in hotel industry as they are in any other.

1.13 Key Terms

Hygiene: The practice of keeping surroundings clean in order to protect from diseases is known as hygiene.

Personal Hygiene: The practice of keeping oneself clean in order to protect from diseases is known as personal hygiene.

Kitchen Hygiene: The practice of keeping kitchen clean in order to protect from diseases is known as kitchen hygiene.

Protective Clothing: The uniform worn during the work hours to protect oneself from the hazards of occupation is known as protective clothing.

Chef Cap: A cap worn by chef during working hours to protect hair fall in food.

Scarf: This protective piece of cloth is worn around neck and soaks excessive sweating and prevents falling in cooked food.

Chef Coat: A coat worn by chefs to prevent the chef from being scalded by hot liquids or spattering hot oil and thermal shocks.

Chef Pant: Generally the chef either uses a black trousers or black and white check pants.

Apron: Apron has dual function to perform, one is the protection of chef coat from stains and secondly the protective function i.e. protecting from the burns and scalds from spillage of boiling liquids in kitchen.

Shoes: The shoes again are a protective gear. It protects feet from fall of boiling liquids and sudden falling of sharp tools like knife etc. The shoes should be black and well polished. To prevent slipping the sole should be made of rubber. Black socks a standard in our kitchens.

Classical Kitchen Brigade: One of Escoffier's important achievements was the reorganization of the kitchen. This reorganization divided the kitchen into departments, or stations, based on the kinds of foods produced.

The Chef: Chef is the person in charge of the kitchen. In large establishments, this person has the title of executive chef. The executive chef is a manager who is responsible for all aspects of food production, including menu planning, purchasing, costing, planning work schedules, hiring, and training.

The Sous Chef (soo shef) is directly in charge of production and works as the assistant to the executive chef or chef de cuisine. (The word sous are French for "under.") Because the executive chef's responsibilities may require a great deal of time in the office, the sous chef takes command of the actual production and the minute-by-minute supervision of the staff.

The Station Chefs, or Chefs de Partie, are in charge of particular areas of production. The following are the most important station chefs.

The Sauce Chef, or Saucier (so-see-ay), prepares sauces, stews, and hot hors d'oeuvres, and sautés foods to order. This is usually the highest position of all the stations.

The Fish Cook, or Poissonier (pwah-so-nyay), prepares fish dishes. In some kitchens, this station is handled by the saucier.

The Vegetable Cook, or Entremetier (awn-truh-met-yay), prepares vegetables, soups, starches, and eggs. Large kitchens may divide these duties among the vegetable cook, the fry cook, and the soup cook.

The Roast Cook, or Rôtisseur (ro-tee-sur), prepares roasted and braised meats and their gravies and broils meats and other items to order. A large kitchen may have a separate broiler cook, or grillardin (gree-ar-dan), to handle the broiled items. The broiler cook may also prepare deep-fried meats and fish.

The Pantry Chef, or Garde Manger (gard mawn-zhay), is responsible for cold foods, including salads and dressings, pâtés, cold hors d'oeuvres, and buffet items.

The Pastry Chef, or Pâtissier (pa-tees-syay), prepares pastries and desserts.

The Relief Cook, swing cook, or Chef de Tournant (toor-nawn), replaces other station heads.

The Expediter, or Aboyeur (ah-bwa-yer), accepts orders from waiters and passes them on to the cooks on the line. The expediter also calls for orders to be finished and plated at the proper time and inspects each plate before passing it to the dining room staff. In many restaurants, this position is taken by the head chef or the sous chef.

Cooks and assistants in each station or department help with the duties assigned to them. For example, the assistant vegetable cook may wash, peel, and trim vegetables. With experience, assistants may be promoted to station cooks and then to station chefs.

Larder Section: The larder is a room set aside for the storage of perishable foods, both raw and cooked, where food as meat, fish, poultry and game are prepared and made ready for cooking. In this department too, all cold items found on the menu, such as hors d'oeuvres, cold dish or meat dishes, cold salads, etc. are prepared and dressed.

Sauce Section: The sauce section is responsible for providing all meat, poultry, game and offal dishes with the exception of those that are plain roasted or grilled. All the meat dishes are cooked and garnished.

Roast Section: The roast section is responsible for providing all roast dishes of meat, poultry and game. It is responsible for all grilled dishes of meat, chicken, offal and fish, and this duty is often delegated to the grill cook.

Fish Section: This section is responsible for the provision of all fish dishes with the exception of those that are plain grilled or deep fried. The cleaning, de-scaling, filleting, crumbling is done by the fishmonger in larder.

Vegetable Section: An entremet course in France was the responsibility of the entremet of vegetables, who skilfully prepared and cooked vegetables, which could be served as a separate course. An entremet was originally something sent to the table between the courses in France.

Soup Section: It is the responsibility of this section to prepare soups such as consommés, creams, velouté, purees, broths, bisques and many special international soups.

Indian Section: This section is responsible for the preparation, of all Indian dishes. The work is subdivided into subsections such as: Indian (bread and rice, pulaos, biryanis, chappaties, puries, bhaturas, etc.), vegetables, (bhajeas, curries), meat, (including eggs and fish), tandoor (seekh kababs, tandoor chicken, boti kababs), Indian sweets jalebis, rasgullas, rabri, etc.) Each day a variety of dishes are prepared according to menu requirements.

Pastry Section: The function of this section is to prepare hot and cold sweets, for lunches, dinners and pastries for tea-time and other occasions. It also prepares pastes like short and puff pastry, frying batters for making noodles for supply to other corners of the kitchen.

The Single Line (or Pullmann) Kitchen: This is a smart and simple solution for narrow rooms, ideally with one wall over 10 feet long, without windows or doors.

The Galley Kitchen: This shape offers the most efficient use of space, making it the choice of many professional chefs. The two rows allow room for lots of preparation space, and moving between activity areas can be as easy as turning around. However, this shape is not ideal if the corridor is open at both ends, since it can cause traffic congestion.

The L-Shape Kitchen: This is a very popular kitchen layout - ideal for a family kitchen, or for entertaining guests, since it can easily accommodate table and chairs in the same room.

The U-Shape Kitchen: The use of three full walls in a room offers the perfect working kitchen. The fridge, range and sink can be spaced out for maximum efficiency and convenience.

The Island Kitchen: A very popular kitchen type, the island layout is perfect if you plan to entertain but requires more floor space. An independent island unit can face a dining or living area, allowing the cook to socialise while preparing.

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1.15 Review Questions

1. What is kitchen brigade?
2. Write a note on Modern kitchen organization.
3. What are the various sections of modern hotel kitchen?
4. Who gave the concept of classical kitchen brigade?
5. Explain the functions of following sections of kitchen:
 - a. Larder Section
 - b. Sauce Section
 - c. Roast Section
 - d. Vegetable Section
 - e. Soup Section
 - f. Indian Section
 - g. Pastry Section
6. Write a note on Kitchen Layouts.
7. Explain following kitchen layout:
 - a. Single line (or Pullmann) kitchen
 - b. Galley kitchen
 - c. L-shape kitchen
 - d. U-shape kitchen
 - e. Island kitchen
 - f. G-Shaped Kitchen
8. Write job description of following kitchen personnel:
 - a. Executive Chef

- b. Sous Chef
 - c. Pastry Chef
 - d. Kitchen Executive
 - e. Chef de Partie
 - f. Demi-Chef de Partie
 - g. Commis
 - h. Chef Garde Manger
9. Write a detailed note on Attribute, Attitude and etiquette of kitchen personnel.

UNIT: 2

KITCHEN EQUIPMENTS FUELS AND SAFETY

Structure

- 2.1 Introduction
- 2.2 Objectives
- 2.3 Classification of Kitchen Equipments
 - 2.3.1 Large equipments
 - 2.3.1.1 Ranges
 - 2.3.1.2 Induction cook-top
 - 2.3.1.3 Ovens
 - 2.3.1.4 Deep Fat Fryer
 - 2.3.1.5 Steamers
 - 2.3.1.6 Hot Cupboards and Bain-Marie
 - 2.3.1.7 Grills and Salamander
 - 2.3.1.8 Tilting Skillet
 - 2.3.2 Mechanical Equipment
 - 2.3.2.1 Mixer
 - 2.3.2.2 Peeler
 - 2.3.2.3 Miners
 - 2.3.2.4 Refrigerator
 - 2.3.2.5 Dishwasher
 - 2.3.3 Utensils and small equipments
 - 2.3.3.1 Pots
 - 2.3.3.2 Pans
 - 2.3.3.3 Measuring Equipments
 - 2.3.3.4 Hand Tools
 - 2.3.3.5 Sinks
 - 2.3.3.6 Tables
 - 2.3.3.7 Knives
- 2.4 Fuel
 - 2.4.1 Characteristics of a Good Fuel
 - 2.4.2 Classification of Fuel
 - 2.4.2.1 Solid Fuel
 - 2.4.2.2 Liquid Fuel
 - 2.4.2.3 Gaseous Fuel
 - 2.4.3 Comparison of Various Fuels
- 2.5 Fire
- 2.6 First Aid
- 2.7 Summary
- 2.8 Key Terms
- 2.9 References/Bibliography
- 2.10 Review Questions

2.1 Introduction

Kitchen equipment is expensive and to justify the expense it is essential that maximum use is made of it. This can only be done if the equipment works efficiently and this depends upon the care and maintenance. The type of fuel used is an important factor. Though solid fuel and oil both have their place under certain circumstance, but for professional cookery the choice lies between electricity and gas. In India soft coke is being in small establishments sometimes. Firewood is used in Tandoor. The routine use, care and cleaning of all items of equipment are important and this should be appreciated and understood. When selecting equipment, capacity, trade name, good quality simple design and easy to clean should be the criteria. The purpose and price is also considered.

2.2 Objectives

After reading this unit the learner will be able to understand:

- Classification of Kitchen Equipments
- Large equipments
- Mechanical Equipment
- Utensils and small equipments
- Characteristics of a Good Fuel
- Classification of Fuel
- Comparison of Various Fuels
- Classification of fire
- Types and Usage of Extinguishers
- First Aid

2.3 Classification of Kitchen Equipments

Kitchen equipment may be divided into following categories:

1. Large equipment: - Ranges, Steamers, Boiling pan, Fish fryers, Sinks and Tables etc.
2. Mechanical Equipment: - Peeler, Mincers, Mixers, Refrigerator, Dishwasher.
3. Utensils and small equipments:- Pots, Pans, Whisks, Spoons, cutting tools like knives etc.

2.3.1 Large Equipments

A vast array of specialized equipment is available for today's kitchens. It would take a large book, not just a short chapter, to describe all of the many items you will encounter in your career items such as pasta machines, crêpe machines, burger formers, breading machines, cookie droppers, beverage machines, Greek gyro broilers, doughnut glazers, conveyor fryers, and so on. In this technological age, nearly every year brings new tools to simplify various tasks. In this section we will learn about some of the large equipments used in kitchen.

2.3.1.1 Ranges

A large variety of stove is available fired by gas, electricity, solid fuel or oil. Solid tops should be washed clean, or wiped clean with a cleaning pad. When cool, the stove is more thoroughly cleaned by washing and using an abrasive such as emery paper. After any kind of cleaning, a solid top should always be lightly greased. On the open type of stove all the bars and racks should be removed, immersed in hot water with detergent, scrubbed clean, dried and put back in the place on the stove. All gas jets should then be lit to check that none are blocked. All enamel parts of the stove should be cleaned while warm with hot detergent solution, rinsed and dried. The inside of ovens and oven racks should be cleaned while slightly warm, using detergent solution and mild abrasive. In cases of extreme dirt or grease being stuck on to the stove or oven, a caustic jelly may be used, but thorough rinsing must take place afterwards. Oven doors should not be slammed as this is liable to cause damage. The unnecessary lighting or the lighting of ovens too early can cause wastage of fuel, which is a waste of money.

2.3.1.2 Induction cook-top

The top of an induction unit does not become hot. Rather, it works by magnetically agitating the molecules in steel or iron cookware so the cookware becomes hot. As a result, much less energy is used and the kitchen stays cooler, because only the pots and pans and their contents become hot. There are no hot surfaces or open flames. Also, no warm-up is required. The top can be turned instantly on or off. Small, easily portable induction burners are available. These are useful for off-premise catering operations, for buffet service, and even for tableside heating and cooking. The disadvantage of this cook-top is that only iron or steel pots can be used. Traditional aluminium or copper cookware will not work. Some manufacturers of cookware have responded to the new demand by producing pots and pans made of aluminum sandwiched between layers of stainless steel. In this way, the good heat-conducting qualities of aluminium are preserved as well as adapted to this new technology.

2.3.1.3 Ovens

The oven and the range top are the two workhorses of the traditional kitchen, which is why they are so often found in the same unit. Ovens are enclosed spaces in which food is heated, usually by hot air or, in some newer kinds of ovens, by microwaves or infrared radiation. In addition to roasting and baking, ovens can do many of the jobs normally done on the range top. Many foods can be simmered, stewed, braised, or poached in the oven, freeing the range top and the chef's attention for other tasks. There are many kinds of ovens beyond those discussed here, but they are often for specialty or high volume uses. These include conveyor ovens, which carry foods through the oven on a steel conveyor belt; holding ovens or warmers, which are designed to hold many types of foods at serving temperatures for extended periods without drying out or overcooking (this category includes ovens that also cook the food, then automatically switch to holding temperature); and high-volume roll-in ovens, with large doors into which one can roll carts loaded with trays of food.

Conventional Ovens: Conventional ovens operate simply by heating air in an enclosed space. The most common ovens are part of the range unit, although separate oven units or ovens as part of a broiler unit are also available. Stack ovens are units that consist of individual shelves or decks arranged one above the other. Pans are

placed directly on the oven deck rather than on wire shelves. Temperatures are adjustable for each deck.

Convection Ovens: Convection ovens contain fans that circulate the air and distribute the heat rapidly throughout the interior. Because of the forced air, foods cook more quickly at lower temperatures. Also, shelves can be placed closer together than in conventional ovens without blocking the heat flow.

2.3.1.4 Deep Fat Fryer

These are among the items of equipment that are commonly used in catering establishments. An unskilled or careless worker can cause money to be lost by food or fat being spoiled through misuse of the friture. Modern fryers are heated by gas or electricity. Most incorporate a thermostatic control in order to save fuel and prevent oven heating. A fairly recent development is the "cool zone". This is where the heating elements are at the sides of the fire but the lower part is kept at a reduced temperature. This stops particles that may fall off the food being fried from dropping to the bottom of the friture, burning and so spoiling other foods cooked.

This form of heating also saves fat; Frying baskets can also be used. Deep fat fryers should be cleaned daily after use by:

- Turning off the heat and allowing the fat to cool.
- Draining off and straining the fat.
- Closing the stopcock, filling the fryer with hot water containing detergent and boiling for 10-15 minutes.
- Draining off the detergent water, refilling with clean water plus vinegar and water, and re-boiling for 10-15 minutes.
- Draining off the water, drying the fryer, closing the stopcock and refill with clean fat.

Do's and Don'ts : The following points relate to the operation of the equipment.

- When filling kettles with solid fats, set the thermostat at 250°F (120°C) until the fat has melted enough to cover the heating elements.
- Keep the kettles filled to the fill line.
- Make sure the drain valve is shut before adding fat to the empty kettle.
- Check the accuracy of the thermostat regularly by reading the fat temperature with a thermometer.

2.3.1.5 Steamers

Steaming ovens that work from a main steam supply need little maintenance. The door controls should be greased occasionally. The steamer trays and runners should be washed in hot detergent water. This type of equipment is usually fitted with a gauge which registers steam pressure (1/2 lb. per square inch), also an overflow valve which gives a warning whistle, if the pressure reaches danger point. These should be periodically checked by a qualified engineer to ensure that they are working correctly. A constant supply of water should be maintained in the generating tank. Steamer trays and the inside of the steamer should be cleaned with detergent water and rinsed. Many types are available in different metals and various sizes (10, 15, 20 and 40 liters or more capacity). They may be heated by gas, electricity or steam from the main supply. As they are used for cooking large quantities of food, it is important that they do not allow the food to burn. It is for this reason that the steam-jacket type (double walled)

boiler is most suitable. Many of these boilers are fitted with a tilting device to facilitate the emptying of the contents. After use, the pan and lid should be thoroughly washed with a mild detergent solution and then rinsed well. Any moving parts should be greased, occasionally and checked to see that they are in good working order. If gas fired, the gas jets and pilot should be inspected to ensure correct working. If a pressure gauge and safety valve are fitted, these should be checked to see that they are working correctly.

2.3.1.6 Hot Cupboards and Bain-Marie

Hot cupboards (commonly referred to in the trade as the hot plates) are used for heating plates and serving dishes and for keeping food hot. Care should be taken to see that the amount of heat fed into the hot cupboards and a thermostat is necessary in maintaining this. Hot cupboards may be heated by gas, electricity or steam. The doors should slide easily and essential greasing may be necessary. The tops of most cupboards are used as serving counters and should be heated to a higher temperature than the inside. These tops are usually made of stainless steel and should be cleaned thoroughly after each service. (Method as for cleaning stainless steel) Bain-marie in this case are open walls of water used for keeping foods hot and are available in many designs, some of which are incorporated into the hot cupboards, some in serving counters, and there is a type which is fitted at the end of the cooking range. They may be heated by steam, gas or electricity, and sufficient heat to boil the water in the bain-marie should be available. Care should be taken to see that a bain-marie is never allowed to burn dry when the heat is turned on. After use, the heat must be turned off, and the bain-marie cleaned thoroughly inside and out side with detergent water, rinsed and dried. And drain off tap should be than checked for any blockage and then closed.

2.3.1.7 Grills and Salamander

The salamander, heated from above, probably causes more wastage of fuel than any other item of kitchen equipment, through being allowed to burn unnecessarily for long unused periods Most salamanders have more than one set of heating element or jets, and it is not always necessary to have them all turned on. Salamanders are heated by gas or electricity or a combination of the two. Bars and draining trays should be cleaned regularly with hot water containing grease solvent such as soda. After rinsing thoroughly they should be replaced and the salamander lit for a few minuets to dry the bars. For an UNDER FRIED GRILL to work effectively it must be capable of cooking food quickly and it should reach a high temperature (within 15-20 minutes) after lighting and the heat should be turned off immediately after use. When the bars are cool, they should be removed and-washed in hot water containing a grease solvent, thoroughly rinsed and dried, and replaced upon the grill. Care should be taken with the fire-bricks if they are used for lining the grill as they are easily broken.

CONTACT GRILLS: These are sometimes referred to as a double-sided infra-grills, having two heated surfaces facing each other. These grills are electrically heated and are capable of cooking certain foods very quickly. The electricity should be turned off after use. When the grill is cool, the cooking surface should be cleaned with a stiff wire-brush. The surfaces are then wiped clean With a damp cloth and lightly oiled to prevent rusting.



Figure 2.2 Creamer Attachment



Figure 2.3 Dough Kneader

2.3.2.2 Peeler

Use for peeling the raw potato, with the help of special emery lining inside the feeder, Peeler is designed aesthetically and is used to peel the skin of potatoes in faster way. Potato peeler leads to minimum peel loss and for better peeling and continuous flow of water in the drum helps to carry away the waste from drainage pipe. The drum storage capacity ranges from 6 to 8 kg potatoes. Care while using peeling machines:

- Potatoes should be free of earth and stones before loading into the machine, otherwise damage to the machine will result.
- Before any potatoes are loaded, the water spray should be turned on and the abrasive plates set in motion.
- The interior should be cleaned daily and the abrasive plate removed to ensure that small particles are not lodged below.
- The- peel trap should be emptied as frequently as required.
- The waste outlet should be kept free from obstructions.

2.3.2.3 Miners

A meat grinder or meat mincer is a kitchen appliance for grinding, fine mincing or mixing raw or cooked meat, fish, vegetables or similar food. It replaces tools like the mincing knife, for example, which has been used to produce minced meat, filling etc. The producer puts the minced food into a funnel, which is placed on the top of the grinder. From there the material goes on a horizontal screw conveyor. This screw conveyor that can be powered by a hand wheel or an electric motor squashes and partially mixes the food. At the end of the screw conveyor there is a knife installed directly in front of the fixed hole plate. At this opening the minced meat comes out of the machine. The fineness of the meat depends on the size of the holes of the plate. The meat grinder was invented by Karl Drais in the 19th century. By changing the hole plate it is also possible to produce breadcrumbs or fill sausage casing. After the drop from the retainer, it is possible to change the hole plate. By removing the fixing screw the grinder can be disassembled completely for cleaning. Besides the domestic manually or motor operated grinders, there are also grinders for butchery (table- or shop-grinders for example) and for the food industry. Some large machines are able to produce several tons per hour.

2.3.2.4 Refrigerator

In order to maintain a refrigerator at peak efficiency, the following points should be observed:

- Defrost weekly. The control should be turned to defrost, the racks should be emptied and racks and interior surfaces washed, rinsed and dried. If the refrigerator is not defrosted regularly, excess frost accumulates on the
- Cooling system, acts as an insulator and causes the refrigerator motor to work longer than is necessary, thus shortening the life of the components.
- The door or doors should be kept closed as much as possible. If too much warm air is allowed to enter the refrigerator plant, it overworks and excess frost can accumulate on the cooling system.
- Food should be stored sensibly and in such a way that the cold air can circulate all around. Excessive packing of food into a refrigerator should be avoided.
- A qualified engineer should be called in at the first sign of any defect in the machinery operating a refrigerator.

2.3.2.5 Dishwasher

A dishwasher is a mechanical device for cleaning dishes and eating utensils. Dishwashers can be found in restaurants and private homes. Unlike manual dishwashing, which relies largely on physical scrubbing to remove soiling, the mechanical dishwasher cleans by spraying hot water, typically between 55 to 75 °C (130 to 170 °F) at the dishes, with lower temperatures used for delicate items. A mix of water and detergent is used for cleaning purposes, followed by clean water to remove the detergent residue. Some dishwashers have multiple wash and rinse periods within the complete cycle. In some dishwashers, a rinsing aid (also called rinse aid) can be added to the rinse cycle to improve drying and avoid water spots remaining on dry items. Large heavy-duty dishwashers are available for use in commercial establishments (e.g. hotels, restaurants) where a large number of dishes must be cleaned. Unlike a home dishwasher, commercial units typically are not multi-level, and only wash a single tray of dishes per cycle. This is not an inconvenience since trays are batch-processed consecutively one after the other. They can wash a rack of dishes or a rack of 25 glasses in just approximately one minute.

CHECK YOUR PROGRESS-II

Q.1 Write short note on mincing machine.

Q.2 What are the uses of Peeler?

Q.3 Which equipment is used for cold storing food?

Q.4 Describe dish washer.

2.3.3 Utensils and Small Equipments

Apart from large and mechanical equipments various utensils, small equipments and hand tools are used in kitchen some of them are described in this section.

2.3.3.1 Pots

Stockpot: A large, deep, straight-sided pot for preparing stocks and simmering large quantities of liquids. Stockpots with spigots allow liquid to be drained off without disturbing the solid contents or lifting the pot. Sizes: 8-200 quarts (liters).

Saucepot: A round pot of medium depth. Similar to a stockpot but shallower, making stirring or mixing easier. Used for soups, sauces, and other liquids. Sizes: 6-60 quarts (liters).

Brazier: A round, broad, shallow, heavy-duty pot with straight sides. Also called a rondeau. Used for browning, braising, and stewing meats. Sizes: 11-30 quarts (liters).

2.3.3.2 Pans

Saucepan: Similar to a small, shallow, light saucepot, but with one long handle instead of two loop handles. May have straight or slanted sides. Used for general range-top cooking. Sizes: 11 to15 quarts (liters).

Sauté pan, straight-sided: Also called a sautoir. Similar to a shallow, straight-sided saucepan, but heavier. Used for browning, sautéing, and frying. Because of its broad surface area, the sauté pan is used for cooking sauces and other liquids when rapid reduction is required. Sizes: 21to25 inches (65-130 mm) deep; 6-16 inches (160-400 mm) in diameter.

Sauté pan, slope-sided: Also called a sauteuse. Used for general sautéing and frying of meats, fish, vegetables, and eggs. The sloping sides allow the cook to flip and toss items without using a spatula, and they make it easier to get at the food when a spatula is used. Sizes: 6-14 inches (160-360 mm) top diameter.

Cast-iron skillet: Very heavy, thick-bottomed fry pan. Used for pan-frying when steady, even heat is desired.

Double boiler: A pot with two sections. The lower section, similar to a stockpot, holds boiling water. The upper section holds foods that must be cooked at low temperatures and cannot be cooked over direct heat. Size of top section: 4-36 quarts (liters).

2.3.3.3 Measuring Equipments

Scales. Most recipe ingredients are measured by weight, so accurate scales are important. Portion scales are used for measuring ingredients as well as for portioning products for service. Traditional portion scales are spring-operated and usually have a dial to indicate weight. More accurate digital scales are electrically operated and provide a digital readout.

Volume measures used for liquids have lips for easy pouring. Sizes are pints, quarts, half-gallons, and gallons. Each size is marked off into fourths by ridges on the sides.

Measuring cups are available in 1-, 1/2-, 1/3-, and 1/4-cup sizes. They can be used for both liquid and dry measures. Measuring spoons are used for measuring very small volumes: 1 tablespoon, 1 teaspoon, 1/2 teaspoon, and 1/4 teaspoon. They are used most often for spices and seasonings. Ladles are used for measuring and portioning liquids. The size, in ounces, is stamped on the handle. Scoops come in standard sizes and have a lever for mechanical release. They are used for portioning soft solid foods. The number of the scoop indicates the number of level scoopfuls per quart. In actual use, a rounded scoopful is often more practical than a level scoopful, so exact weights will vary. Thermometers measure temperature. There are many kinds for many purposes.

- A meat thermometer indicates internal temperature of meats. It is inserted before cooking and left in the product during cooking.
- An instant-read thermometer gives readings within a few seconds of being inserted in a food product. It reads from 0°F to 220°F. Many chefs carry these in their jacket pocket like a pen, ready whenever needed. Instant-read thermometers must not be left in meats during roasting, or they will be damaged.
- Fat thermometers and candy thermometers test temperatures of frying fats and sugar syrups. They read up to 400°F.
- Special thermometers are used to test the accuracy of oven, refrigerator, and freezer thermostats.

2.3.3.4 Hand Tools

Rubber spatula or scraper: A broad, flexible rubber or plastic tip on a long handle. Used to scrape bowls and pans. Also used for folding in egg foams and whipped cream.

Pie server: A wedge-shaped offset spatula. Used for lifting pie wedges from pan.

Bench scraper or dough knife: A broad, stiff piece of metal with a wooden handle on one edge. Used to cut pieces of dough and to scrape workbenches.

Spoons: slotted, perforated, and solid: Large stainless-steel spoons that hold about 3 ounces (90 mL). Used for stirring, mixing, and serving. Slotted and perforated spoons are used when liquid must be drained from solids.

China cap: A cone-shaped strainer. Used for straining stocks, soups, sauces, and other liquids. Pointed shape allows the cook to drain liquids through a relatively small opening.

Fine china cap or chinois (shee-nwah): A china cap with very fine mesh. Used when great clarity or smoothness is required in a liquid.

Strainer: A round-bottomed, cup-shaped tool made of screentype mesh or perforated metal. Used for straining pasta, vegetables, and so on.

Drum sieve or Tamis: A screen-type mesh supported in a round metal frame. Used for sifting flour and other dry ingredients and for puréeing soft foods.

Pastry bag and tubes: Cone-shaped cloths or plastic bags with an open end that can be fitted with metal tubes or tips of various shapes and sizes. Used for shaping and decorating with items such as cake icing, whipped cream, duchesse potatoes, and soft dough. Pastry brush: Used to brush items with egg wash, glaze, etc.

Can opener: Heavy-duty can openers are mounted on the edge of the workbench. They must be carefully cleaned and sanitized every day to prevent contamination of foods. Replace worn blades, which can leave metal shavings in the food.

2.3.3.5 Sinks

Different materials are used for sinks according to the purpose for which they are intended:

- Heavy galvanized iron for heavy pot wash.
- Teak or other hard wood for glass or china wash. (If hard wood sinks are left unused for long periods of time, they should be filled with cold water to prevent shrinkage of the timber.)
- Stainless steel for general purposes.
- Glazed earthenware for general light purposes. Sinks, drainers, waste and overflow outlets should be cleaned with a suitable abrasive power cleaner, thoroughly rinsed with plenty of clean water and left to dry.

2.3.3.6 Tables

Wooden tables should be scrubbed clean with hot soda water, rinsed and wiped dry as soon as possible to prevent warping. Formica or Stainless steel topped tables should be washed with hot detergent water, rinsed with hot water and dried. Marble Slabs should be scrubbed with hot water and rinsed. All excess moisture should be removed with a dry cloth. No cutting or chopping should be allowed on table-tops; chopping boards

must be used. Hot pans must not be placed upon tables; triangles must be used to protect the table-tops. The legs and racks or shelves of tables are cleaned with hot detergent water and then dried. Wooden table legs require scrubbing.

2.3.3.7 Knives

Chef's knives and other knives have a number of parts, and you should be familiar with their names. These parts are illustrated in the diagram. The spine is the back of the blade. It is the edge opposite the cutting edge. The tip is the pointed end of the blade, while the heel is the back end of the blade closest to the handle. On some knives, the blade has a raised part called a bolster at the heel end. The bolster is a sort of guard that helps protect the hand from slips and also helps balance the weight of the knife. The tang is the portion of the metal blade inside the handle. The highest-quality, most durable knives have a full tang, which means the tang runs the full length of the handle. On knives with traditional wood handles, rivets hold the handle to the tang. The rivets should be perfectly smooth and flush with the handle. Composite molded handles are bonded to the tang without rivets.

VARIOUS KNIVES AND THEIR USES

French knife or chef's knife: Most frequently used knife in the kitchen, for general-purpose chopping, slicing, dicing, and so on. The blade is wide at the heel and tapers to a point. Blade length of 10 inches (260 mm) is most popular for general work. Larger knives are for heavy cutting and chopping. Smaller blades are for more delicate work. This is your most important tool, so you must learn to handle it and care for it well.

Santoku knife or Japanese cook's knife: A wide-bladed knife that is becoming increasingly popular as a substitute for the traditional chef's knife. Blades are usually 5 inches (13 cm) or 7 inches (18 cm) long.

Utility knife or salad knife: A narrow, pointed knife 6-8 inches (160-200 mm) long. Used mostly for pantry work, cutting and preparing lettuce, fruits, and so on. Also useful for carving roast chicken and duck.

Paring knife: A small pointed blade 2-4 inches (50-100 mm) long. Used for trimming and paring vegetables and fruits.

Boning knife: A thin, pointed blade about 6 inches (160 mm) long. Used for boning raw meats and poultry. Stiff blades are used for heavier work. Flexible blades are used for lighter work and for filleting fish.

Pastry wheel or wheel knife: A round, rotating blade on a handle. Used for cutting rolled-out doughs and pastry and baked pizza.

CHECK YOUR PROGRESS-III

Q.1 Write short note on hand tool.

Q.2 Write short note on knives used in kitchen?

Q.3 Write short note on measuring equipments used in kitchen?

2.4 Fuel

Any substance which produces heat is known as fuel. Fuel when burnt, i.e. on coming in contact and reacting with oxygen or air, produces heat. Thus, the substances classified as fuel must necessarily contain one or several of the combustible elements: carbon, hydrogen, sulphur, etc. In the process of combustion, the chemical energy of fuel is converted into heat energy. The term fuel includes all combustible substances obtainable in bulk. It is a substance, which produces a large amount of heat when burnt with the atmospheric oxygen. To utilize the energy of fuel in most usable form, it is required to transform the fuel from its one state to another, i.e. from solid to liquid or gaseous state, liquid to gaseous state, or from its chemical energy to some other form of energy via single or many stages. In this way, the energy of fuels can be utilized more effectively and efficiently for various purposes.

Definition: ‘We can define fuel as any combustible substance containing carbon as main constituent which on burning liberates large amount of heat that can be used for

industrial as well as for domestic purposes'. For example, coal, wood, charcoal, petrol, diesel, kerosene, liquefied petroleum gas, compressed natural gas etc.

2.4.1 Characteristics of a Good Fuel

These are as follows:

- **High Calorific Value:** 'Amount of heat liberated in complete combustion of unit
- mass or unit volume of a fuel in the presence of excess air or oxygen is called as calorific value'. Fuel should possess high calorific value as the amount of heat liberated on combustion of fuel and temperature attained depends upon calorific value.
- **Moderate Ignition Temperature:** 'The temperature required to preheat fuel so that it can start burning smoothly or the minimum temperature at which active combustion of the fuel takes place when the firing at once started, is called as ignition temperature'. Too high ignition temperature causes difficulty in combustion while too low ignition temperature may create safety problems during storage, transport and use of the fuel, therefore it should be moderate.
- **Low Non-combustible Matter Content:** The non-combustible matter reduces the calorific value because it remains generally in the form of ash or clinker after combustion which involves additional cost of handling and disposal of the waste products as well as creates hindrance in combustion. Hence, fuel should have low content of non-combustible matter.
- **Low Moisture Content:** The presence of moisture will reduce the calorific value and increase its cost so moisture content should be as low as possible.
- **The Combustion Products should not be Harmful:** The fuel on combustion should not liberate harmful gases such as SO₂, CO, H₂S, NH₃ etc. which can cause harm to living organisms and environment.
- **Moderate Velocity of Combustion:** The velocity of combustion should be moderate neither high nor low.
- **Easy to Store and Transport:** Fuel should be safe, convenient and economic for storage and transportation.
- **Efficient Burning:** It should burn in air with efficiency. Too much smoke and obnoxious odours are not desirable.
- **Size:** In case of solid fuel, the size should be uniform so that combustion is regular.
- **Spontaneous Combustion should not Undergo:** Spontaneous combustion can cause fire hazards therefore fuel should not undergo it.
- **Controllable Combustion:** A fuel should start burning in a controlled manner and should be able to be stopped when required.

- **Cheaper Cost:** It should be readily available in sufficient amount at cheaper rate.
- **Size of Briquette:** It should be uniform.

2.4.2 Classification of Fuel

Fuel may be classified on various criteria like physical state, ease of availability, mode of their procurement(natural/manufactured) and amount of heat produced by them i.e. calorific value. On the basis of occurrence or origin fuels may be classified as under:

- Natural
- Artificial

Natural Fuel: Fuels which are obtained directly from the nature, and can be used as such or after a little processing are known as primary fuels. The common examples of natural fuel are Wood, Coal, Petroleum, Natural gas etc.

Artificial Fuels: Fuels which are obtained after the modification and treatment of primary fuels are known as secondary fuels. The common examples of artificial fuels are Coke, Gasoline, Diesel, Kerosene, Petrol etc.

On the basis of their physical states, fuels are classified into following categories:

- **Solid fuels:** Wood, coal, coke, charcoal etc.
- **Liquid fuels:** Kerosene, diesel, petroleum, gasoline, etc.
- **Gaseous fuels:** Coal gas, water gas, natural gas, etc.

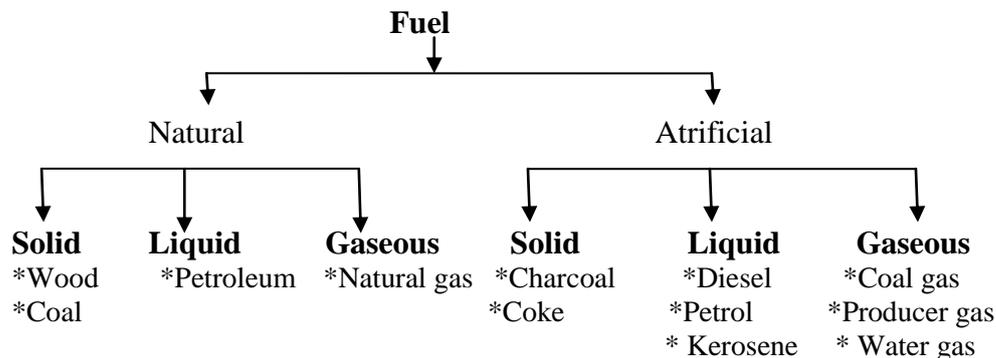


Figure 2.4 Classification of Fuel

2.4.2.1 Solid Fuel

As the name suggests these fuels are solid at normal conditions. Solid fuels have the lowest ratio of hydrogen to carbon and may contain an appreciable fraction of oxygen. These are found in solid state. Solid fuels are easy to transport and can be conveniently stored without any risk of spontaneous explosion. Production cost of these fuels is low. These have moderate ignition temperature but require excess air for complete combustion and possess less calorific value as compared to liquid or gaseous fuels. Coal presents the largest reserves of fossil fuels and is more distributed than any other reserves in category of solid fuel. Solid fuels are mainly classified into two categories, i.e. natural fuels, such as wood, coal, etc. and manufactured fuels, such as charcoal, coke, briquettes, etc.

Examples of solid fuel: There are several solid fuels which are readily used. They are:

- Wood

- Coal
- Charcoal
- Coke
- Briquettes etc.

Wood: Wood obtained from trees and one among the age old fuel used by mankind. In India, wood is used in almost every village, as well as in small towns and cities. In some parts of country, wood is used for industrial purposes as well. Wood is vegetable tissue of trees and bushes. It consists of mainly cellular tissue and lignin and lesser parts of fat and tar, as well as sugar. The calorific value of wood ranges from 4700 calorie per kilogram to 5300 calorie per kilogram depending upon the type of wood. The ash content of wood is negligible. A freshly felled tree may have moisture ranging from 40% to 60% depending upon the species of the tree as well as the seasons of the year. On exposure to atmospheric air, the moisture dries up and reduces to 15-20% in about 18 months. Wood ignites very easily. That is why it is used for lighting other fuels. The average ignition temperature of different kinds of wood may vary slightly. The easy availability, low ignition temperature makes wood as economic a widely used fuel.

Coal: Coal is a fossil fuel. The large deposits of coal in India are in Bengal, Bihar and Madhya Pradesh. Most of the Indian coal is of low grade variety and coal washing to obtain low ash metallurgical coal is unavoidable. Over 30% of coal output is consumed by railways, another similar proportion is used by industry including iron and steel works. This leaves barely 40% of coal mined for use of the power supply undertakings. Coal is classified into three major types namely anthracite, bituminous, and lignite. However there is no clear demarcation between them and coal is also further classified as semi-anthracite, semi-bituminous, and sub-bituminous. Anthracite is the oldest coal from geological perspective. It is a hard coal composed mainly of carbon with little volatile content and practically no moisture. Lignite is the youngest coal from geological perspective. Calorific value of coal is defined as the quantity of heat given out by burning one unit weight of coal in a calorimeter. The calorific value of coal is higher than wood. It is more compact source of heat energy, easy in transportation and higher calorific value makes coal a preferred industrial fuel.

Advantages of solid fuel: The various advantages of solid fuels are as under:

- They are easy to transport.
- They are convenient to store without any risk of spontaneous explosion.
- Their cost of production is low.
- They possess moderate ignition temperature.

Disadvantages of solid fuel: The various advantages and disadvantages of solid fuels are as under:

- Their ash content is high.
- Their large proportion of heat is wasted.
- They burn with clinker formation.
- Their combustion operation cannot be controlled easily.
- Their cost of handling is high.

2.4.2.2 Liquid Fuel

The fuel which remains liquid at room temperature is known as liquid fuel. The liquid fuels can be classified as follows:

- Natural or crude oil, and
- Artificial or manufactured oils.

Natural or Crude Oil: Petroleum is a basic natural fuel. It is a dark greenish brown, viscous mineral oil, found deep in earth's crust. It is mainly composed of various hydrocarbons (like straight chain paraffins, cyclo-paraffins or naphthenes, olefins, and aromatics) together with small amount of organic compounds containing oxygen nitrogen and sulphur. The average composition of crude petroleum is :

C = 79.5 to 87.1%;

H = 11.5 to 14.8%;

S = 0.1 to 3.5%,

N and O = 0.1 to 0.5%.

Petroleum are graded according to the following physio-chemical properties :

- Specific gravity,
- Calorific value,
- Flash point or ignition point,
- Viscosity,
- Sulphur contents,
- Moisture and sediment content, and
- Specific heat and coefficient of expansion.

Artificial or Manufactured Oils: Manufactured liquid fuels include Gasoline, Diesel oil, Kerosene, Heavy oil, Naptha, Lubricating oils, etc. These are obtained mostly by fractional distillation of crude petroleum or liquefaction of coal.

Advantages of Liquid Fuel: The advantages of liquid fuels are as under:

- They possess higher calorific value per unit mass than solid fuels.
- They burn without dust, ash, clinkers, etc.
- Their firing is easier and also fire can be extinguished easily by stopping liquid fuel supply.
- They are easy to transport through pipes.
- They can be stored indefinitely without any loss.
- They are clean in use and economic to handle.
- Loss of heat in chimney is very low due to greater cleanliness.
- They require less excess air for complete combustion.
- They require less furnace space for combustion.

Disadvantages of Liquid Fuel: The disadvantages of liquid fuels are as under :

- The cost of liquid fuel is relatively much higher as compared to solid fuel.
- Costly special storage tanks are required for storing liquid fuels.
- There is a greater risk of fire hazards, particularly, in case of highly inflammable and volatile liquid fuels.
- They give bad odour.
- For efficient burning of liquid fuels, specially constructed burners and spraying apparatus are required.

2.4.2.3 Gaseous Fuel

Gaseous fuels occur in nature, besides being manufactured from solid and liquid fuels. They are in gaseous state at room temperature. The gaseous fuels are classified as under:

- Natural
- Artificial

Natural Gas: Methane is the main constituent of Natural gas and accounting for about 95% of the total volume. Other components are: Ethane, Propane, Butane, Pentane, Nitrogen, Carbon Dioxide, and traces of other gases. Very small amounts of sulphur compounds are also present. Since methane is the largest component of natural gas, generally properties of methane are used when comparing the properties of natural gas to other fuels. Natural gas is a high calorific value fuel requiring no storage facilities. It mixes with air readily and does not produce smoke or soot. It has no sulphur content. It is lighter than air and disperses into air easily in case of leak.

Artificial Gas: LPG is a predominant mixture of propane and Butane with a small percentage of unsaturates (Propylene and Butylene) and some lighter C₂ as well as heavier C₅ fractions. Included in the LPG range are propane (C₃H₈), Propylene (C₃H₆), normal and iso-butane (C₄H₁₀) and Butylene(C₄H₈). LPG may be defined as those hydrocarbons, which are gaseous at normal atmospheric pressure, but may be condensed to the liquid state at normal temperature, by the application of moderate pressures. Although they are normally used as gases, they are stored and transported as liquids under pressure for convenience and ease of handling. Liquid LPG evaporates to produce about 250 times volume of gas. LPG vapour is denser than air: butane is about twice as heavy as air and propane about one and a half times as heavy as air. Consequently, the vapour may flow along the ground and into drains sinking to the lowest level of the surroundings and be ignited at a considerable distance from the source of leakage. In still air vapour will disperse slowly. Escape of even small quantities of the liquefied gas can give rise to large volumes of vapour / air mixture and thus cause considerable hazard. To aid in the detection of atmospheric leaks, all LPG's are required to be odorized. There should be adequate ground level ventilation where LPG is stored. For this very reason LPG cylinders should not be stored in cellars or basements, which have no ventilation at ground level.

Advantages of gaseous fuels: Gaseous fuels due to ease and flexibility of their applications possess the following advantages over solid or liquid fuels:

- They can be conveyed easily through pipelines to the actual place of need, thereby eliminating manual labour in transportation.
- They can be lighted at ease.
- They have high heat contents and hence help us in having higher temperatures.
- They can be pre-heated by the heat of hot waste gases, thereby affecting economy in heat.
- Their combustion can readily be controlled for change in demand like oxidizing or reducing atmosphere, length flame, temperature, etc.
- They are clean in use.
- They do not require any special burner.
- They burn without any shoot, or smoke and ashes.
- They are free from impurities found in solid and liquid fuels.

Disadvantages of gaseous fuels: The disadvantages of gaseous fuels are as under:

- Very large storage tanks are needed.
- They are highly inflammable, so chances of fire hazards in their use is high.

2.4.3 Comparison of Various Fuels

The table below summarises the values of various criteria like storage, cost, safety etc of solid, liquid and gaseous fuel:

Sr.	Characteristics	Solid Fuel	Liquid Fuel	Gaseous Fuel
1	Storage	They need large storage space	They need least storage space but do not store them in open	They must be stored in leak proof containers and under pressure in iron cylinders (LPG)
2	Transportation	They can be transported easily without any risk of spontaneous explosion	They can be transported easily through pipelines	They can be transported through pipelines
3	Cost	Cheap and easily available	Costly than solid fuel	Costly, except natural gases
4	Risk	Least risk of Fire accident	Greater risk of fire	Very high risk of fire
5	Use	They cannot be used in internal combustion engines	They can be used in internal combustion engines	They can also be used in internal combustion engines
6	Product of Combustion	They produces ash and its disposal is a big problem	No ash problem	No ash contents are produced
7	Combustion rate	Combustion is slow but its control and stop is not easy	Quickly combustible and can be controlled and stopped as required	Combustion is fast and can be controlled and stopped as required
8	Thermal Efficiency	Low thermal efficiency	Higher thermal efficiency	Highest thermal efficiency
9	Calorific Value	Least calorific value	Higher calorific value	Highest calorific value
10	Smoke	Smoke is produced	Only high carbon or aromatic fuels liquid fuels may produce smoke	No smoke is produced

Table 2.5 Comparison of Solid, Liquid and Gaseous fuels

CHECK YOUR PROGRESS-IV

Q.1 Write short note on fuel.

Q.2 What are the properties of a good fuel?

Q.3 Write short note on gaseous fuel?

2.5 Fire

Fire is among the potential hazards associated with the hotel. Hotel must be equipped to safeguard guest and its property from the fire. All the employees must be aware of any specific procedure laid down for the establishment and be ready to comply with them at all the time.

The three basic elements if present at a place will result in outbreak of fire. They are:

- Fuel (a combustible substance)
- Oxygen (necessary as fire is an oxidation reaction)

- Heat (ignition temperature)

If any one of them is absent the fire cannot outbreak. Therefore fire can be extinguished by following three principles:

- Starving
- Smothering
- Cooling

Starving: Starving is the removal of the fuel from the vicinity of fire so that there is nothing to burn. Suppose fire outbreaks in the area where wood is stored, it can be extinguished by removing all the wood from that area. This will lead to elimination of one major element necessary for fire.

Smothering: Fire can be extinguished by cutting off supply of air (oxygen) which is necessary for existence of fire. Removal of air is known as smothering.

Cooling: Heat (ignition temperature) is another essential for the existence of fire. Cooling can be achieved by putting water.

CLASSIFICATION OF FIRE

Depending upon combustible material that caught fire, it is classified in to following five groups:

- Class A fire
- Class B fire
- Class C fire
- Class D fire
- Class E fire

Class A: Wood, paper, textile, grass, garbage, and materials composed of cellulose

Class B: Oils, petroleum products, varnishes, paints, non-ionic solvents

Class C: Fire of electrical origin involving electrical short-circuits

Class D: Fire caused in metals e.g. Magnesium, Aluminium, Zinc, Potassium etc.

Class E: Outbreak of fire in gases e.g. Liquefied Petroleum Gases (LPG), Methane, Compressed Natural Gases (CNG) etc.

Procedure in the Event of Fire

Most of the hotels follow the following procedure in an event of fire:

- The person concerned must be informed immediately on detection of fire.
- Do not panic
- Warn other people on the vicinity and sound the fire alarm
- Do not jeopardize your own safety or that of others
- Follow the procedure laid down by your establishment
- Fire brigade must be informed immediately
- Do not try to extinguish fire if you are not trained for the same otherwise your faulty procedure may lead to spread of fire.

- If you are trained for fire fighting, use appropriate fire extinguisher to extinguish fire, if the fire is small.
- Close doors and windows; turn off supply of electricity and gas.
- Do not wait for the fire to get out of control before calling fire brigade.

It is important that all the passageways are kept clear and doors should open outwards. Fire exits are marked properly and should remain visible in darkness too. The fire extinguishers should be placed at proper places and should be in working conditions. Periodic fire drills should occur and should be taken sincerely since lives may be endangered if fire outbreaks. Fire detecting systems, sprinkling system, smoke detecting system, fire fighting equipments, fire houses etcetera should be inspected and tested at regular intervals to ensure that they remain functional in the event of fire.

Fire Extinguisher Ratings

Class A Extinguishers will put out fires in ordinary combustibles, such as wood and paper. The numerical rating for this class of fire extinguisher refers to the amount of water the fire extinguisher holds and the amount of fire it will extinguish.



Class B Extinguishers should be used on fires involving flammable liquids, such as grease, gasoline, oil, etc. The numerical rating for this class of fire extinguisher states the approximate number of square feet of a flammable liquid fire that a non-expert person can expect to extinguish



Class C Extinguishers are suitable for use on electrically energized fires. This class of fire extinguishers does not have a numerical rating. The presence of the letter “C” indicates that the extinguishing agent is non conductive.



Class D Extinguishers are designed for use on flammable metals and are often specific for the type of metal in question. There is no picture designator for Class D extinguishers. These extinguishers generally have no rating nor are they given a multi-purpose rating for use on other types of fires.



TYPES OF FIRE EXTINGUISHERS

Halon extinguishers contain a gas that interrupts the chemical reaction that takes place when fuels burn. These types of extinguishers are often used to protect valuable electrical equipment since they leave no residue to clean up. Halon extinguishers have a limited range, usually 4 to 6 feet. The initial application of Halon should be made at the base of the fire, even after the flames have been extinguished.

Dry Chemical extinguishers are usually rated for multiple purpose use. They contain an extinguishing agent and use a compressed, non-flammable gas as a propellant

Water These extinguishers contain water and compressed gas and should only be used on Class A (ordinary combustibles) fires.

Carbon Dioxide (CO₂) extinguishers are most effective on Class B and C (liquids and electrical) fires. Since the gas disperses quickly, these extinguishers are only effective from 3 to 8 feet. The carbon dioxide is stored as a compressed liquid in the extinguisher; as it expands, it cools the surrounding air. The cooling will often cause ice to form around the “horn” where the gas is expelled from the extinguisher. Since the fire could re-ignite, continue to apply the agent even after the fire appears to be out.

2.6 Basic First Aid

According to oxford dictionary, first aid is the medical help that one gives to somebody who is hurt or ill before the doctor arrives. It is mandatory for the establishment that they should have adequate first aid equipment, facilities, and trained personal to provide first aid at the work area. If the injury is serious, the injured person should be treated by a doctor or qualified nurse as soon as possible.

First Aid Equipments: There should be a first aid box in the work area. First-aid box should be easily identifiable and accessible in the work area. It should be in the charge of a responsible person. A regular replenishment of the first-aid box is necessary so that first-aid may be given in case of requirement. A first aid box must contain at least following things:

- A card giving general first-aid guidance
- 20 individually wrapped, sterile, adhesive, waterproof dressings of various sizes
- An antiseptic lotion and antiseptic cream
- 4 X 25 g. cotton wool packets
- 1 dozen safety pins
- 2 triangular bandages
- 2 sterile eye pads, with attachment
- 4 medium-sized sterile un-medicated dressings
- 2 large size sterile un-medicated dressings
- 2 extra large size sterile un-medicated dressings
- Scissors
- A report book to record all injuries.

FIRST-AID FOR SOME COMMON PROBLEMS

Shock: the signs of shock are faintness, sickness, clammy skin and pale face. Shock should be treated by keeping the person comfortable, lying down and warm. Cover the person with blanket or clothing, but do not apply hot water bottles.

Cuts: All cuts should be washed with the antiseptic lotion and should be covered with waterproof dressing. When there is considerable bleeding it should be stopped as soon as possible. If bleeding persists it may be stopped by bandaging firmly or pressing the artery with the thumbs and immediate medical assistance is necessary.

Nose Bleeding: In case of nose bleeding, sit the person down with the head forward, and loosen clothing round the neck and chest. Warn the person not to blow the nose for several hours. If bleeding persists seek the medical assistance.

Fainting: Fainting may occur after a long period of standing in a hot, badly ventilated area. The signs of an impending faint are whiteness, giddiness and sweating. A faint should be treated by raising the legs slightly above the level of the head and, when the person recovers the consciousness, putting in the fresh air for a while and making sure that the person has not incurred any injury in fainting

Fractures: The best treatment for fracture is to make the affected part immobile before doing anything. Immediately seek the assistance of doctor.

Burns and Scalds: Burn is caused by dry heat source like flame or hot articles whereas scalds are caused by wet heat source like steam or boiling liquids. The burnt part should be placed under running cold water or immerse in cold water till pain ceases. Seek the assistance of doctor if required.

CHECK YOUR PROGRESS-V

Q.1 Write short note on classification of fire.

Q.2 Write short note on Procedure in event of fire?

Q.3 Write short note on fire fighting equipments?

2.7 Summary

Thorough knowledge of equipment is essential for success in the kitchen. Few food-service operations depend on nothing more than a range and an oven, an assortment of pots and pans, and knives and other hand tools. Modern technology continues to develop more and more specialized and technically advanced tools to reduce kitchen labor. Much of this equipment is so complex or so sophisticated that only firsthand instruction and practice will teach you how to operate it effectively and safely. Other items, especially hand tools, are simple and need no explanation but require much practice to develop good manual skills. A vast array of specialized equipment is available for today's kitchens. It would take a large book, not just a short chapter, to describe all of the many items you will encounter in your career items such as pasta machines, crêpe machines, burger formers, breading machines, cookie droppers, beverage machines, Greek gyro broilers, doughnut glazers, conveyor fryers, and so on. In this technological age, nearly every year brings new tools to simplify various tasks.

2.8 Key Terms

Santoku knife or Japanese cook's knife: A wide-bladed knife that is becoming increasingly popular as a substitute for the traditional chef's knife. Blades are usually 5 inches (13 cm) or 7 inches (18 cm) long.

Utility knife or salad knife: A narrow, pointed knife 6-8 inches (160-200 mm) long. Used mostly for pantry work, cutting and preparing lettuce, fruits, and so on. Also useful for carving roast chicken and duck.

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Boning knife: A thin, pointed blade about 6 inches (160 mm) long. Used for boning raw meats and poultry. Stiff blades are used for heavier work. Flexible blades are used for lighter work and for filleting fish.

Pastry wheel or wheel knife: A round, rotating blade on a handle. Used for cutting rolled-out doughs and pastry and baked pizza.

Rubber spatula or scraper: A broad, flexible rubber or plastic tip on a long handle. Used to scrape bowls and pans. Also used for folding in egg foams and whipped cream.

Pie server: A wedge-shaped offset spatula. Used for lifting pie wedges from pan.

Bench scraper or dough knife: A broad, stiff piece of metal with a wooden handle on one edge. Used to cut pieces of dough and to scrape workbenches.

Spoons: slotted, perforated, and solid: Large stainless-steel spoons that hold about 3 ounces (90 mL). Used for stirring, mixing, and serving. Slotted and perforated spoons are used when liquid must be drained from solids.

China cap: A cone-shaped strainer. Used for straining stocks, soups, sauces, and other liquids. Pointed shape allows the cook to drain liquids through a relatively small opening.

Fine china cap or chinois (shee-nwah): A china cap with very fine mesh. Used when great clarity or smoothness is required in a liquid.

Strainer: A round-bottomed, cup-shaped tool made of screentype mesh or perforated metal. Used for straining pasta, vegetables, and so on.

Drum sieve or Tamis: A screen-type mesh supported in a round metal frame. Used for sifting flour and other dry ingredients and for puréeing soft foods.

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Class A Extinguishers will put out fires in ordinary combustibles, such as wood and paper. The numerical rating for this class of fire extinguisher refers to the amount of water the fire extinguisher holds and the amount of fire it will extinguish.

Class B Extinguishers should be used on fires involving flammable liquids, such as grease, gasoline, oil, etc. The numerical rating for this class of fire extinguisher states the approximate number of square feet of a flammable liquid fire that a non-expert person can expect to extinguish

Class C Extinguishers are suitable for use on electrically energized fires. This class of fire extinguishers does not have a numerical rating. The presence of the letter “C” indicates that the extinguishing agent is non conductive.

Class D Extinguishers are designed for use on flammable metals and are often specific for the type of metal in question. There is no picture designator for Class D extinguishers. These extinguishers generally have no rating nor are they given a multi-purpose rating for use on other types of fires.

Shock: the signs of shock are faintness, sickness, clammy skin and pale face. Shock should be treated by keeping the person comfortable, lying down and warm. Cover the person with blanket or clothing, but do not apply hot water bottles.

Cuts: All cuts should be washed with the antiseptic lotion and should be covered with waterproof dressing. When there is considerable bleeding it should be stopped as soon as possible. If bleeding persists it may be stopped by bandaging firmly or pressing the artery with the thumbs and immediate medical assistance is necessary.

Nose Bleeding: In case of nose bleeding, sit the person down with the head forward, and loosen clothing round the neck and chest. Warn the person not to blow the nose for several hours. If bleeding persists seek the medical assistance.

Fainting: Fainting may occur after a long period of standing in a hot, badly ventilated area. The signs of an impending faint are whiteness, giddiness and sweating. A faint should be treated by raising the legs slightly above the level of the head and, when the person recovers the consciousness, putting in the fresh air for a while and making sure that the person has not incurred any injury in fainting

Fractures: The best treatment for fracture is to make the affected part immobile before doing anything. Immediately seek the assistance of doctor.

Burns and Scalds: Burn is caused by dry heat source like flame or hot articles whereas scalds are caused by wet heat source like steam or boiling liquids. The burnt part should be placed under running cold water or immerse in cold water till pain ceases. Seek the assistance of doctor if required.

2.9 References/Bibliography

1. K Arora, Theory of Cookery, Franc Bro & Co. New Delhi
2. P S Bali, Food Production Operations, Oxford University Press, New Delhi
3. Wayne Gisslen, Professional cooking, John Wiley & Sons

2.10 Terminal Questions

1. Write short notes on:
 - a. Large equipments used in kitchen
 - b. Mechanical Equipment used in kitchen
 - c. Utensils and small equipments used in kitchen
2. Write short note on kitchen ranges.
3. What are the uses of griller?

4. Which equipment is used for bulk frying?
5. What are the different types of Oven?
6. Describe tilting skillet.
7. Write short note on mincing machine.
8. What are the uses of Peeler?
9. Which equipment is used for cold storing food?
10. Describe dish washer.
11. Write short note on hand tool.
12. Write short note on knives used in kitchen?
13. Write short note on measuring equipments used in kitchen?

UNIT 3: INGREDIENTS USED IN COOKING

Structure

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- 3.14 Further Reference/Bibliography
- 3.15 Terminal Questions

3.1 Introduction

In the last chapter we have learnt about the different methods of cooking being applied from the production of food in hotel kitchens and other food service operations. In this chapter we are going to learn different food commodities involved in the preparation of various dishes of the world. The characteristics of these commodities play vital role in compiling tastier and mouth-watering dishes. In economics, a *commodity* is the generic term for any marketable item produced to satisfy wants or needs. Food commodity refers to all kinds of raw food materials available in the market which are meant for saleable to the customers at price. In this chapter we are going to study about cereals, pulses, vegetables, fruits, flour, salt, sugar and fat, their structure and their involvement in food preparation.

In the last unit we have learnt the different types of vegetables and their uses in cookery. In this unit we are going to understand about basic commodity i.e milk. Milk has been a source for food for humans since the beginning of recorded history. Animal milk is known to have been used first as human food around 5000 BC. Milk byproducts found inside Stone Age pottery from Turkey indicate processed milk was consumed in 6500 BC. It is presumed that when animals such as cattle were first domesticated, it was only for purposes of meat. Milk most often means the nutrient fluid produced by the mammary glands of female mammals. The female ability to produce milk is one of the defining characteristics of mammals and provides the primary source of nutrition for newborns before they are able to digest more diverse foods. Although the use of fresh milk has increased with economic development, the majority of consumption occurs after milk has been heated, processed, or made into butter. The milk industry became a commercial enterprise when methods for preservation of fluid milk were introduced. The successful evolution of the dairy industry from small to large units of production, ie, the farm to the dairy plant, depended on sanitation of animals, products, and equipment; cooling facilities; health standards for animals and workers; transportation systems; construction materials for process machinery and product containers; pasteurization and sterilization methods; containers for distribution; and refrigeration for products in stores and homes.

3.2 Objectives

The objective of studying this chapter is to make the students understand:

- Different types of herbs and spices used in cookery
- Medicinal benefits of the same
- The characteristics and behavior of the basic food ingredients.
- Their types
- Their uses in cookery
- Their purchasing criteria and
- Their storing method
- Characteristic of milk
- Types of milk and milk products
- Preparation and uses of milk and its products
- Handling and storage of milk

3.3 Herbs & Spices

The culinary term "*herb*" is typically referred to the leafy green parts of a plant used for culinary purposes, meanwhile the term "*spices*" refers to other parts of the plant, including seeds, berries, bark, root and fruit used for the same purposes. Culinary herbs are distinguished from vegetables in that, like spices, they are used in small amounts and provide flavor rather than substance to food. Some plants are used as both a spice and herb.

Herbs and spices have been an essential factor in health care through the ages in all cultures. They are prepared in number of ways to extract their active ingredients for internal and external use. There are a number of different systems of herbal medicine, the most important of which are Chinese and Indian (*Ayurvedic*) systems of medicine. All spices are medicinal and are used extensively in indigenous systems of medicine. Extracts from herbs and spices are used as infusions, decoctions, macerations, tinctures, fluid extracts, teas, juices, syrups, poultices, compresses, oils, ointments and powders. Many medicinal herbs used in *Ayurveda* have multiple bioactive principles. It is not always easy to isolate compounds and demonstrate that the efficacy can be attributed to any one of the active principles.

3.3.1 Active Plant Constituents

Herbs and spices are rich in volatile oils, which give pleasurable aromas. In addition, herbs may contain *alkaloids* and *glycosides*, which are of greater interest to pharmacologists.

Some of the main active constituents in herbs are as follows:

1. Acids – these are sour, often antiseptic and cleansing.
2. Alkaloids – these are bitter, often based on alkaline nitrogenous compounds. They affect the central nervous system and many are very toxic and addictive.
3. Anthraquinones – these are bitter, irritant and laxative, acting also as dyes.
4. Bitters – various compounds, mainly *iridoides* and *sesquiterpenes* with a bitter taste that increases and improves digestion.
5. Coumarines – are antibacterial, anticoagulant, with a smell of new-mown hay.
6. Flavones – these are bitter or sweet, often diuretic, antiseptic, antispasmodic and anti-inflammatory. Typically yellow, and present in most plants.
7. Glycosides – there are four main kinds of glycosides.
 - Cardiac: affecting heart contractions;
 - Synogenic: bitter, antispasmodic sedative, affecting heart rate and respiration;
 - Mustard oil: acrid, extremely irritant;
 - Sulphur: acrid, stimulant, antibiotic.
8. Gums and mucilages – these are bland, sticky or slimy, soothing and softening.
9. Resins – often found as oleo-resins or oleo-gum resins – they are acrid, astringent, antiseptic, healing.
10. Saponins – are sweet, stimulant hormonal, often anti-inflammatory, or diuretic, soapy in water.
11. Tannins – are astringent, often antiseptic, checking bleeding and discharges.
12. Volatile oils – are aromatic, antiseptic, fungicidal, irritant and stimulant.

3.3.2 Herbs and their Medicinal Value

Basil: Basil is a member of the mint family. Most types have shiny, light-green leaves and a pungent, slightly sweet aroma. There are many types of basil, each slightly different in aroma and taste. One of the most widely used herbs for seasoning tomatoes and tomato sauces, basil plays a key role in Mediterranean, Asian, and Middle Eastern cuisine. Basil particularly complements the flavor of garlic and olives. It is also pleasing when combined with lemon dressing.

Medicinal value: Basil is a good source of vitamin K and manganese. The essential oil in basil has been found to contain antioxidant, anticancer, antiviral and antimicrobial properties. anti-inflammatory; antioxidant, strengthens defenses against asthma, osteoarthritis and rheumatoid arthritis.

Bay Leaf: The green, pointed leaves, usually sold dried, are grown on a small tree belonging to the laurel family. They add a pungent, almost evergreen, flavor to foods, and the whole leaf must be removed before the food is served. Bay leaves are used to season a variety of foods. Their use is especially called for in simmered dishes, soups, stews, sauces, and tomato dishes. Bay leaves can easily overwhelm a food, so use them with caution. The longer they cook the more flavor they add.

Medicinal value: It is mainly used in medicine for its digestive and anti-gas properties. Herbalists also recommend it for stomach cramps, mouth infection, teeth disorder, insect bites vomiting, constipation, headaches, cough, heart and respiratory disorder, and anxiety.

Chervil: A member of the parsley family, chervil has dark-green curling leaves. Its delicate flavor is similar to that of parsley, with a hint of anise and lemon. Considered essential in French cooking, it is excellent in salads, soups, and vinaigrettes and with seafood. Chervil can be used to replace parsley. It should be used fresh, when its flavor is best. A caution: chervil can lose flavor when it is overcooked.

Medicinal value: Chervil has been used in the past as a diuretic, expectorant, digestive aid, and skin freshener. It was also thought to relieve symptoms of eczema, gout, kidney stones, and pleurisy. It is most widely known as a remedy for high blood pressure today.

Chives: A member of the onion family, chives have long, slender, hollow green stems and are usually sold in bundles. The mellow, delicate onion flavor of chives is useful for sauces, soups, baked potatoes, salads, omelets, pasta, seafood, and meat. They are also commonly used as a garnish. In addition, their light-purple flowers are edible. Use fresh chives when possible because dried chives have little flavor. Chives can lose flavor when cooked too long.

Medicinal value: Chives are members of the onion family, and possess the same beneficial properties their bigger brothers. All Alliums can be used for control of Cholesterol and high blood pressure. They have anti-bacterial and anti-fungal properties, and a paste or Ointment made out of onion is said to prevent infection in

wounds and burns. Another use externally for age spots, warts, or freckles is to mix onion juice with vinegar and rub on the affected areas.

Cilantro: Cilantro is also related to the parsley family. Its lacy green leaves have a pungent, juniper like spicy flavor. A popular seasoning used worldwide, cilantro particularly complements spicy foods. It is commonly used in Mediterranean, Latin American, and Middle Eastern cuisines. Cilantro is often found in salsa. It can overpower a dish. Use it judiciously, adding a little at first. Cilantro may be referred to as “fresh coriander” because its seeds are ground into the spice coriander.

Medicinal value: The herb is a good source of minerals like potassium, calcium, manganese, iron, and magnesium. Rich in many vital vitamins including folic-acid, riboflavin, niacin, vitamin-A, beta carotene, vitamin-C that are essential for optimum health. Regulates cholesterol and high blood pressure,

Dill: Another member of the parsley family, dill has feathery leaves and flat, oval-shaped brown seeds. Both are used for seasoning. The leaves have a pungent, tangy taste, and the seeds have a bitter flavor with caraway overtones. Dried leaves are sold as dill weed. Dill complements the flavor of fish, chicken, eggs, salads, and a variety of vegetables. It is also used as a pickle flavoring. Use fresh dill leaves whenever possible; drying causes them to lose their flavor. The leaves also make a lacy garnish. Dill weed should be used at the end of cooking so it will keep its flavor. Alternatively, heat intensifies the flavor of dill seed.

Medicinal value: used mostly as a stomach soother and anti-gas remedy. It is also said to increase mother's milk and help treat breast congestion from nursing. It is mild, and makes a good remedy for colic in babies.

Fennel: Fennel has long, green, feathery leaves on celery like stems. Both stem and leaves have a delicate, anise-like flavor and may be eaten as a vegetable. Flowers produce seeds that may also be used as a flavoring. Raw fennel stems and leaves may be added to salads. Fennel also can be used to flavor cheese, sauces, mayonnaise, and bread. Fennel is a traditional seasoning for fish. Use fresh fennel whenever possible to maximize flavor. Overcooking can cause fennel to lose its flavor.

Medicinal value: Rich in volatile oils, fennel is a cleansing and medicating herb, and can be used for a steam facial for opening pores and rejuvenating facial skin. It also acts as mouth freshener and intestine soother. Fennel may be an effective diuretic and a potential drug for treatment of hypertension. Fennel is what's known as a carminative herb, meaning that it can ease bloating, gas pains, and digestive spasms in the small and large intestines. Fennel can also reduce bad breath and body odor that originates in the intestines. Women who are breastfeeding may find that fennel, which works in a way similar to the body's hormones, increases milk flow.

Lavender: Spikes of pungently aromatic purple flowers and gray-green leaves make identification of this herb easy. It is a traditional flavoring for teas, candies, and desserts. Lavender also can add a subtle and different flavor to custard and ice cream.

Medicinal value: it has antiseptic, anti-bacterial, anti-fungal, anti-inflammatory, anti-convulsive, and last but certainly not least - anti-depressant properties.

Lemon Balm: A member of the mint family, lemon balm imparts a strong lemony flavor to foods. Use it in fruit or vegetable salads, to garnish fish, or to freshen drinks. Lemon balm can stand in for lemon peel in most recipes. In ancient times it was used to “balm” (comfort) wounds and to flavor alcoholic beverages such as claret and mead. It even served as one of the first “air fresheners” — during the Middle Ages it was strewn onto floors and when walked on would release its lemon scent.

Medicinal value: it has anti viral properties and is extensively used to cure cold, fever, mumps and cold sores. It calms a nervous stomach, colic, or heart spasms.

Lemon Grass: Also known as citronella grass, lemon grass has long, green stalks and serrated leaves. The stalks have a lemony aroma and flavor tinged with ginger. Only the lower 4 to 6 inches of the stalk is used. Lemon grass is common in Thai and south-east Asian cooking. It enhances the flavor of curries, stews, soups, chicken, and seafood. Make sure to remove the lemon grass before serving. Fresh lemon peel and grated ginger can be used in place of lemon grass.

Medicinal value: it is a stomach soother and cholesterol reducer, and an effective insect repellent and fungicide.

Marjoram: Marjoram is made from the short, pale-green leaves of a shrub cultivated throughout Europe for centuries. Closely related to oregano, marjoram has a flavor resembling that of mint and basil. Marjoram is used in many tomato-based dishes, but it has a flavor that complements just about any food. It is used widely in Mediterranean cooking and makes an excellent flavoring for oil and vinegar. This herb can be used interchangeably with oregano. Buy it fresh when possible.

Medicinal value: It has been used historically for relief from symptoms of hay fever, sinus congestion, indigestion, asthma, stomach pain, headache, dizziness, colds, coughs, and nervous disorders. It is a gently fragrant, calming herb that does have mild antioxidant and anti-fungal properties.

Mint: Mint’s cool, aromatic menthol taste and smell are instantly recognizable. There are hundreds of varieties of mints: peppermint and spearmint are the most popular. Often used as a dessert or candy flavoring, mint also adds an interesting flavor to sauces, meat dishes, salads, and iced tea. Lamb is traditionally served with mint jelly. Herbs that mix well with mint include cilantro, basil, and marjoram.

Medicinal value: Herbalists the world over use mint, as a premier stomach tonic, to counteract nausea and vomiting, promote digestion, calm stomach muscle spasms, relieve flatulence, and ease hiccups. Menthol, the aromatic oil in peppermint, also relaxes the airways and fights bacteria and viruses. Menthol interferes with the sensation from pain receptors, thus it may be useful in reducing headache pain. Scientific evidence suggests that peppermint can kill many kinds of micro-organisms, and may boost mental alertness. In one study, people who inhaled menthol said they felt as if it relieved their nasal congestion, although it didn't increase their measurable air flow.

Oregano: Closely related to marjoram, oregano has a woody stalk with small green leaves. Considered less sweet than marjoram, it is thought to have a stronger, more peppery flavor. A ubiquitous pizza sauce flavoring, oregano is also widely used in

Mediterranean cuisine (mainly Italian and Greek) and in meat and poultry dishes. Oregano retains its flavor when dried.

Medicinal value: Oregano contains at least four compounds that soothe coughs and 19 chemicals with antibacterial action that may help reduce body odor. The ingredients in oregano that soothe coughs may also help un-knot muscles in the digestive tract, making oregano a digestive aid. This familiar spice also contains compounds that can lower blood pressure too.

Parsley: Parsley has long, slender stalks and feathery leaves. It has a tangy, fresh, sometimes lemony flavor. There are two main types: curly leaf and flat leaf. The flat-leaf type has a more intense, peppery flavor. A popular garnish, parsley also can be added to soups, marinades, and salads. Both types are often used to bring out the flavor of other herbs. The flat-leaf variety is typically used for cooking because of its more intense flavor. The flavor of both types is stronger in the stalks.

Medicinal value: Parsley is a vitamin and mineral powerhouse, and as such should be part of every medicinal garden. Parsley contains a large amount of chlorophyll, and as such is a natural breath sweetener. Eat the leaves right off the plant to combat breath odors. Throughout history, Parsley Teas have been used mainly as kidney stone, bladder infection, and jaundice medications, as well as digestive aids. The root appears to be more effective than the leaves, but leaves can also be used. Leaves can be dried, pulverized into a powder, and inserted in capsules, if desired.

Rosemary: Rosemary has needle-shaped evergreen leaves and a piney, lemon flavor. Rosemary is used to season a variety of dishes, particularly in Mediterranean cuisine. It may be sprinkled on another of this region's specialties: focaccia bread. Rosemary branches can be burned under grilled meat or fish for a more subtle flavor. Use rosemary judiciously. It can be overpowering.

Medicinal value: it has lots of medicinal uses, including use as a tonic, a digestive aid, to treat depression, headaches, and muscle spasms, and as an expectorant, promoter of menstrual flow, and stimulant for production of bile. Externally, its oil made into an ointment has been said to treat rheumatism, sores, eczema, bruises, and wounds. Rosemary taken internally as a medicine can be an irritant to the stomach, intestines, and kidneys, so use it sparingly.

Sage: The soft, somewhat furry gray-green leaves of this herb have a pungent and camphor-like taste and aroma. A strongly flavored herb, sage enhances poultry stuffing, sausage, veal, and tomato sauces. Excellent for flavoring oils and vinegar, sage goes well with thyme and oregano.

Medicinal value: Of all the culinary herbs, sage is perhaps the one with the broadest range of medicinal uses. Sage is anti-hypertensive, anti-diabetic, anti-inflammatory and anti-microbial; plus it helps cleanse your blood and may even prevent Alzheimer's disease.

Sorrel: The slender, arrow-shaped leaves of sorrel impart a sharp or acidic flavor to creamed soups, meats, omelets, vegetables, or breads. Its flavor is due to oxalic acid,

which should be avoided by people with a history of oxalate kidney stones. Young tender leaves are mildest in flavor and may be cooked and served as a vegetable.

Medicinal value: Sorrel is known to be a sedative, a diuretic, tonic and is also a folk remedy for cancer, reduction blood pressure, mild bladder infections, nausea and also promotes regular urination. Organic Sorrel includes all these healing properties with a unique and refreshing taste. It is also known for its medicinal uses against ailments such as fever, stomach cramps, inflammation, common cold, and bronchial complaints.

Tarragon: Native to Siberia, this herb has narrow and pointed, highly aromatic dark-green leaves. It has a delicate anise flavor with undertones of sage. A staple in French sauces, tarragon is also widely used in chicken, fish, and vegetable dishes. It may be used as a flavoring for wine vinegar. There are two types of tarragon: French and Russian. The French variety has a delicate flavor, whereas the Russian tarragon has a stronger, slightly bitter taste.

Medicinal value: Tarragon is a versatile herb that appears to contain preventative substances for cancer and possibly some viruses. It can be made into a Tea that is particularly effective when used with Lemon Balm for prevention of the flu or herpes. It is also effective for eliminating intestinal worms in children. Relieves in toothaches and crushed Tarragon leaves can be used on minor rashes and skin irritations for relief of the symptoms.

Thyme: There are several varieties of this herb, which has small, grey-green leaves and tiny purple flowers. Garden thyme is the most widely used for cooking. It has a strong, somewhat bitter flavour. Thyme is often used in herb butters, stuffing, soups, and dishes with potatoes or beans as the main ingredient. It is excellent in pasta sauces and is considered an important culinary herb in Europe, particularly in France. Lemon thyme is best suited for fish and egg dishes. Lemon thyme also can be used to make herbal tea.

Medicinal value: It has been used through the centuries as a remedy for many ailments, from epilepsy to melancholy. Nowadays, it is prescribed by herbalists for intestinal worms, gastrointestinal ailments, bronchial problems, laryngitis, diarrhea, and lack of appetite. It has antiseptic properties, and can be used as a mouthwash, skin cleanser, anti-fungal agent for athlete's foot and as an anti-parasitic for lice, scabies, and crabs. For skin inflammations and sores, make a poultice by mashing the leaves into a paste.

3.3.3 Spices and their Medicinal Value

Allspice: Also known as Jamaican pepper, allspice is ground from the hard brown berries of the allspice tree, which grows in Mexico and throughout the Caribbean. Allspice is so named because it imparts the flavor of nutmeg, cloves, and cinnamon. An excellent addition to marinades, allspice is also used to flavor cured and jerked meat, desserts, and sauces. It is also an ingredient in gingerbread. The finest allspice trees are thought to be grown in Jamaica. Use the spice sparingly to avoid overpowering other ingredients.

Medicinal value: The active principles in the allspice found to have anti-inflammatory, rubefacient (warming and soothing), carminative and anti-flatulent properties. The eugenol oil present in it has local anesthetic and antiseptic properties, hence; useful in gum and dental treatment procedures and helps control heart rate and blood pressure. The spice also contains very good amounts of vitamin-A, vitamin B-6 (pyridoxine), riboflavin, niacin and vitamin-C. Vitamin C is a powerful natural antioxidant; regular consumption of foods rich in vitamin C helps body develop resistance against infectious agents and scavenge harmful, pro-inflammatory free radicals.

Anise Seeds: The tiny gray-green anise seeds come from a plant belonging to the parsley family. They have a licorice flavor (anise is used to make licorice), but one that also imparts a feeling of warmth when the seeds are eaten. Used to flavor breads, candies, and alcoholic drinks, anise seeds also can be added to cabbage or braised beef. Anise seed is a common ingredient in Indian vegetable and fish curries. Anise complements the flavor of cinnamon and nutmeg in baked goods. Anise leaves can be used to make herbal tea or added to salads.

Medicinal value: This exotic seed spice contains many plant derived chemical compounds that are known to have anti-oxidant, disease preventing and health promoting properties. Anise seed oil obtained from extraction of the seeds is found application in many traditional medicines as *stomachic*, *anti-septic*, *anti-spasmodic*, *carminative*, digestive, expectorant, stimulant and tonic. The spicy seeds are great source of minerals like calcium, iron, copper, potassium, manganese zinc and magnesium. Potassium is an important component of cell and body fluids that helps control heart rate and blood pressure. Helps in production of RBC in blood.

Asafetida: It is the dried latex (gum oleoresin) exuded from the living underground rhizome or tap root of several species of *Ferula*, which is a perennial herb. The species is native to Afghanistan mountains and are imported to India. Asafetida has a pungent, unpleasant smell when raw, but in cooked dishes, it delivers a smooth flavor, reminiscent of leeks.

Medicinal value: It has a broad range of uses in traditional medicine as an antimicrobial, with well documented uses for treating chronic bronchitis and whooping cough, as well as reducing flatulence. Helps in digestion, asthma, bronchitis, contraception and balances the irregularities in stomach.

Caraway Seeds: These small, crescent-shaped brown seeds have a nutty, peppery flavor. Caraway is often used whole in rye bread or sprinkled over the top of baked goods, particularly in Germany and many northern European countries. It can also be added to potato salad or meat loaf or sprinkled over pasta. Ground caraway seed can have a very strong flavor. Use sparingly. Caraway also is used to flavor aquavit, a Scandinavian liquor.

Medicinal value: Caraway seeds are rich source of dietary fiber so it is good for digestive tract. Fiber also binds to toxins in the food and helps protect the colon mucus membrane from cancers. In addition, dietary fibers bind to bile salts (produced from cholesterol) and decrease their re-absorption in colon, thus help lower serum LDL

cholesterol levels. The seeds also have antioxidant, digestive, carminative, and anti-flatulent properties.

Cardamom: Cardamom is made from the seedpods of a perennial plant that is part of the ginger family. The seeds have a warm, sweet, slightly peppery flavor and an aroma that combines ginger, coriander, and nutmeg. A popular ingredient in Asian cuisine, cardamom also is used in Scandinavian cooking as a flavoring for fruit compotes, gingerbread, and meatballs. It goes well with sweet potatoes and squash. Green cardamom pods are the most flavorful and need to be ground before use. Pods may be bleached or lightened, however, and this processing may affect the flavor. The lightened pods are preferred over the ground seeds, which lose their flavor quickly. Ground cardamom can be mixed with other spices and therefore have a blunted flavor. Cardamom can be expensive. However, a little goes a long way. Less costly versions may have less flavor.

Medicinal value: This exotic spice contains many plant derived chemical compounds that are known to have anti-oxidant, disease preventing and health promoting properties. The therapeutic properties of cardamom-oil have found application in many traditional medicines as antiseptic, antispasmodic, carminative, digestive, diuretic, expectorant, stimulant, stomachic and tonic. Controls heart rate and blood pressure and helps in production of red blood cells.

Cayenne (Crushed Red Pepper): Made from ground dried hot chili peppers, cayenne adds warmth to whatever foods it is added. Capsaicin found in the chili's seeds and membranes gives this pepper its fire. It is popular in Mexican, Caribbean, Chinese, and Indian cuisines. It is also widely used in barbecue sauces. Cayenne is the main ingredient in chili powder. Go easy on the use of cayenne if you are not accustomed to hot foods.

Medicinal value: Cayenne is a spice that is a “must” for any first-aid kit. It will take care of most bleeding problems, external or internal by the time a person counts to ten. If the bleeding is internal, cayenne can be mixed with warm water. It is also known to relieve gas and problems with indigestion. It is also great for relieving headaches. In the case of gas or headache

Celery Seed: Celery seeds are the small brown seeds of the celery plant. They give a strong celery flavoring to foods. The seeds may be somewhat bitter in taste. Added to casseroles, fish, poultry, and sauces, celery seed is also good in potato dishes and stuffing. Celery salt is called for in many recipes. Instead, you can use a small amount of plain celery seed along with some lemon zest.

Medicinal value: The use of celery seed in pills for relieving pain, lowers blood pressure, decreases heart attack. It is sedative and Seed and stalk reduces hypertension and acts as kidney cleanser.

Chili Pepper: Chili pepper varies in intensity, flavor, and color. It is typically rusty red. The powder also may contain cumin, garlic, oregano, or salt. This spice is used to flavor Southwestern cuisine. It is a common ingredient in chili with beans and in chili con carne. It adds heat to dishes with a dash of flavor. Because chili powder ranges in flavor, many people like to grind their own powder from the chili pepper they prefer.

Add the powder sparingly while cooking until the flavor and heat you desire are achieved. The best chili powders are ground from only chili peppers.

Medicinal value: Chili pepper contains impressive list of plant derived chemical compounds that are known to have disease preventing and health promoting properties. It has anti-bacterial, anti-carcinogenic, analgesic and anti-diabetic properties. It also found to reduce LDL cholesterol levels in obese individuals. It also helps to protect body from injurious effects of free radicals generated during stress, diseases conditions.

Cinnamon: Cinnamon is ground from the curled bark of the evergreen cinnamon and cassia trees throughout Asia, India, and Sri Lanka. Cinnamon is sold ground or in sticks. A popular flavoring for cookies, pies, desserts, candies, and coffees, cinnamon can be used to season meats, pasta, and marinades. It is excellent with sweet vegetables. Ground cinnamon has more flavor than cinnamon sticks. Its flavor deteriorates more quickly, however. Depending on the type, cinnamon may range from strong and spicy to sweet and mellow.

Medicinal value: The active principles in the cinnamon spice are known to have anti-oxidant, anti-diabetic, anti-septic, local anesthetic, anti-inflammatory, rubefacient (warming and soothing), carminative and anti-flatulent properties. Cinnamon has highest anti-oxidant strength of all the food sources in nature. Useful in dental and gum treatment procedures. *Cinnamaldehyde* in cinnamon-sticks has been found to have anti-clotting action, prevents clogging of platelets in the blood vessels, and thus helps prevent stroke and coronary artery disease. *Cinnamaldehyde* in cinnamon-sticks has been found to have anti-clotting action, prevents clogging of platelets in the blood vessels, and thus helps prevent stroke and coronary artery disease.

Cloves: Cloves are the oily unopened buds of the clove tree. They have a pungent flavor and aroma. Cloves add flavoring to roasted meat and can be used in pies and baked fruit dishes, cakes, cookies, and gingerbread. Cloves complement the flavor of nutmeg and cinnamon. Ground cloves lose their flavor quickly.

Medicinal value: The active principles in the clove are known to have antioxidant, anti-septic, local anesthetic, anti-inflammatory, rubefacient (warming and soothing), carminative and anti-flatulent properties. Eugenol in it has local anesthetic and antiseptic properties, hence; useful in dental treatment procedures. It increases the motility of the gastro-intestinal tract as well as improves the digestion power by increasing gastro-intestinal enzyme secretions. Thus, helps relieve indigestion and constipation problems. Helps control heart rate and blood pressure and protect body from lung and oral cavity cancers.

Coriander: Coriander, commonly known as Dhania in the Indian Subcontinent or Cilantro in the Americas and some part of Europe, is an herb which is extensively used around the world as a condiment or as a garnish or as a decoration on the dishes. Its scientific name is *Coriandrum Sativum L.* Its leaves and fruits have typical aroma and are used raw or dried in culinary.

Medicinal value: It possess anti rheumatic and anti arthritic properties, which are very beneficial for swelling caused due to these two reasons. For others, such as swelling

due to malfunctioning of kidney or anemia, it is seen to be effective to some extent, as some of the components help excretion of extra water from the body while. Very effective in reducing the cholesterol level in the blood. Controls Diarrhea, mouth ulcer, anemia, conjunctivitis. It also controls blood pressure and menstrual disorder.

Cumin: The dried seeds belonging to the parsley family, cumin have an earthy, nutty flavor and smell. Used in many cultures, cumin is a seasoning for chickpeas, the background flavor for chili, or added to couscous, vegetable dishes, or yogurt. Cumin is often mistaken for caraway. If you grind your own cumin, toast cumin seeds in a dry skillet first to intensify its flavor.

Medicinal value: Cumin seeds contain numerous phyto-chemicals that are known to have antioxidant, carminative and anti-flatulent properties. The seeds are an excellent source of dietary fiber. The active principles in the cumin may increase the motility of the gastro-intestinal tract as well as increase the digestion power by increasing gastro-intestinal enzyme secretions. Regulates growth and development, sperm generation, digestion and nucleic acid synthesis, controls heart rate and blood pressure.

Fenugreek Seeds: Ground from the seeds of a plant belonging to the pea family, fenugreek has a bittersweet flavor but leaves a caramel or maple-like aftertaste. A component in many Indian dishes, fenugreek also can be added to curry powders. Or, it may be used to flavor artificial maple syrups. Use sparingly; the flavor of fenugreek can be overpowering.

Medicinal value: Due to its estrogen-like properties, fenugreek has been found to help increase libido and lessen the effect of hot flashes and mood fluctuations that are common symptoms of menopause and PMS. In India and China it has also been used to treat arthritis, asthma, bronchitis, improve digestion, maintain a healthy metabolism, increase libido and male potency, cure skin problems (wounds, rashes and boils), treat sore throat, and cure acid reflux. Fenugreek also has a long history of use for the treatment of reproductive disorders, to induce labor, to treat hormonal disorders, to help with breast enlargement, and to reduce menstrual pain. Balances cholesterol and high blood pressure, relieves from heartburn and acidity.

Garlic: A spice that is cloves of the herb *Allium sativum*. In its dehydrated form, the flavor enzyme is released only when in combination with water. It exists in powder form and also as salt, chips, and seasoning powder. It is used to flavor meats, vegetables, and sauces. The garlic clove contains various nutrients as water soluble nutrients include vitamins, enzymes, amino acids and natural sugars & oil soluble nutrients includes sulphur compounds originating from an amino acid named alliin which is converted to a pungent compound called *allicin* which has natural antibiotic properties. Presence of sulphur in garlic is the cause of its pungent smell.

Medicinal value: Garlic acts as an antiseptic & helps in curing the wounds very quickly. It helps in fighting against various infection & acts against inflammation and infection, including colds, asthma, bronchitis, coughs by adding a freshly cut raw clove to food three times a day. They help in lowers down the blood pressure & cardiovascular problems. It increases the levels of high density lipoproteins & reduces harmful cholesterol in the blood & keeps arteries and heart healthy. It thins the blood, reduces clotting and helps in controlling blood pressure and poor circulation.

Ginger: In fresh form, the knobby gingerroot's peel is discarded and its flavorful flesh is sliced, chopped, or minced and added to dishes for its peppery, sweet, and pungent flavor. The dried form is ground from the ginger root. This brownish gold spice has a warm, slightly sweet, slightly citrus flavor. Fresh ginger is popular in Asian and Indian cuisine. Ground ginger also is used in many baked goods and desserts. Ginger is the basis for ginger beer and ginger ale. Pickled ginger root is an Asian delicacy and is often served with sushi. Although fresh ginger can be substituted for the dried form, do not substitute dried in place of fresh because the flavors are quite different.

Medicinal value: It contains cancer-fighting antioxidants, hence useful for fighting factors that cause blood clots. Ginger and ginger spice can be beneficial for reducing cholesterol. It offers relief in the conditions of sore throat, cold & cough remedy, and for nausea associated with pregnancy. It is good for sore throat, cough, cold, and cleanses body perspiration. It also relieves from Asthma, Colic, Constipation remedy, Eye diseases, Fever, Migraine headaches, Morning sickness, Motion sickness, Nausea, Rheumatoid arthritis, Urinary Incontinence, Vomiting, etc.

Juniper Berry: The hard purple berries of an evergreen bush, juniper berries have a turpentine-like flavor. Juniper berries add a spicy, pungent flavor to game, red cabbage, or meat stews. Juniper berries give gin its flavor. Berries should be crushed before they are used.

Medicinal value: Juniper berries are a diuretic, act as an appetite suppressant, as a female contraceptive. It also helps in combating bacterial infections such as prostates, vaginitis and inflamed kidneys, Arthritis and Rheumatism. It can be used for treatment of lung disorders and digestive tract problems.

Licorice Root: From this woody plant licorice flavor is extracted and used in candy and medications. The extract also may be used to color and thicken stout or porter beers. The sweet taste of natural licorice extract if ingested in large quantities has adverse effects on blood pressure. For this reason, in the United States, most licorice candy is flavored with anise or is artificially flavored (check labels).

Medicinal value: it is widely used for treatment and control of chronic viral hepatitis, tuberculosis and blood pressure.

Mace and Nutmeg: Both come from the same tree. Nutmeg is ground from the seed. Mace is from the seed's covering. Both have a sweet, warm flavor. Mace is somewhat more pungent. Favorites in baked goods and fruit dishes, mace and nutmeg can also enhance the flavor of stewed beef or poultry or can be added to baked vegetables. Nutmeg is a key spice in holiday classic, eggnog. Both are excellent toppings for the foamed milk on espresso coffee drinks.

Medicinal value: Nutmeg spice as well as mace contains many plant derived chemical compounds that are known to have anti-oxidant, disease preventing and health promoting properties. The active principles in nutmeg have many therapeutic applications in many traditional medicines as anti-fungal, anti-depressant, aphrodisiac, digestive and carminative functions. It helps to control heart rate and blood pressure and helps in production of red blood cells.

Mustard: Mustard seeds can be used in pickling foods. Ground seeds can be added to sauces or to add zip to salad dressings. The condiment can be eaten on meat and fish and added to salad dressings or mayonnaise. Keep prepared mustard in the refrigerator to preserve its flavor. For a different flavor, look for mustard varieties made with wine or vinegar.

Medicinal value: Because of the presence of mucilages, mustard has laxative effects. The white seeded mustard has milder effects, being a source of vegetal oil and an excellent source of proteins, calcium, magnesium, and potassium. Combining it with warm water has the consequence of increasing arterial pressure and stimulating blood circulation. At the same time, mustard has anti-inflammatory properties.

Nigella: The seeds of *N. sativa*, known as kalonji, black cumin (though this can also refer to *Bunium persicum*), onion seed or just nigella, are used as a spice in Indian and Middle Eastern cuisines. The dry-roasted nigella seeds flavor curries, vegetables and pulses. The black seeds taste like a combination of onions, black pepper and oregano, and have a bitterness to them like mustard seeds. It can be used as a "pepper" in recipes with pod fruit, vegetables, salads and poultry.

Medicinal value: The seeds of *Nigella Sativa* are beneficial for the digestive system, soothing stomach pains and spasms and easing wind, bloating and colic. The ripe seed is anthelmintic, carminative, diaphoretic, digestive, diuretic, emmenagogue, galactagogue, laxative and stimulant. An infusion is used in the treatment of digestive and menstrual disorders, insufficient lactation and bronchial complaints. The seeds are used in India to increase the flow of milk in nursing mothers and can be used to treat intestinal worms, especially in children. Externally, the seed is ground into a powder, mixed with sesame oil and used to treat abscesses, hemorrhoids and orchitis. The powdered seed been used to remove lice from the hair.

Paprika: Bright russet-orange in color, paprika is made from ground sweet red peppers. Depending on the variety, paprika may add either a mild, sweet flavor or hot.

Medicinal value: It has been determined that paprika is both a stimulant or energy booster and an antibacterial agent. Also, it is believed that the spice can be used to promote saliva and stomach acid production which in turn promotes better digestion. And scientific research aside, some cultures have been using paprika to regulate blood pressure

Pomegranate seeds: These are obtained from ripe pomegranate. These are taken out of the ripe fruit and then are dried. The taste of the outer covering is sweet, but the inner seed is somewhat bitter. The taste differs depending on the subspecies of pomegranate and its ripeness.

Medicinal value: The rind of the fruit and the bark of the pomegranate tree is used as a traditional remedy against diarrhea, dysentery and intestinal parasites. The seeds and juice are considered a tonic for the heart and throat, and classified as a bitter-astringent (*pitta* or fire) component under the Ayurvedic system, and considered a healthful counterbalance to a diet high in sweet-fatty (*kapha* or earth) components. The astringent qualities of the flower juice, rind and tree bark are considered valuable for a variety of purposes, such as stopping nose bleeds and gum bleeds, toning skin, (after

blending with mustard oil) firming-up sagging breasts and treating hemorrhoids. Pomegranate juice (of specific fruit strains) is also used as eye drops as it is believed to slow the development of cataracts

Poppy: Poppy seed is an oilseed obtained from the opium poppy. The tiny kidney-shaped seeds have been harvested from dried seed pods by various civilizations for thousands of years. The seeds are used, whole or ground, as an ingredient in many foods, and they are pressed to yield poppy seed oil. Whole poppy seeds are widely used as a spice and decoration in and on top of many baked goods. In Indian cuisine, white poppy seeds are added for thickness, texture and also give added flavor to the recipe. Commonly used in the preparation of korma, ground poppy seed, along with coconut and other spices, are combined as the masala to be added at the end of the cooking step. It is quite hard to grind them when raw, so they are normally dry fried, and then mixed with a little water to get the right paste consistency.

Medicinal value: Poppy seeds contain many plant derived chemical compounds that are known to have anti-oxidant, disease preventing and health promoting properties. It prevents coronary artery disease and heart strokes. Poppy seeds outer coat is rich in dietary fiber and so they increase bulk of the food by absorbing water throughout the digestive system and easing constipation condition. The chemicals in poppy seeds have beneficial effects on human body; soothe nervous irritability, act as pain-killers, and used in pharmacy as well as in many traditional medicines in the preparations of cough mixtures, expectorants etc.

Saffron: One of the most expensive spices, this golden red spice is made from the powdery stigma of a purple-flowered crocus. Saffron is used for soups, seafood, poultry, and rice dishes. It is a popular seasoning in Indian, Italian, and Spanish cuisine. It also can be added to baked goods. Saffron needs to be dissolved in a teaspoon or so of warm water before use. Powdered saffron may have other ingredients added to it, and these reduce its flavor.

Medicinal value: Saffron contains many plant derived chemical compounds that are known to have anti-oxidant, disease preventing and health promoting properties. It helps protect body from oxidant-induced stress, cancers, infections and acts as immune modulators. The active components in saffron have many therapeutic applications in many traditional medicines as antiseptic, antidepressant, anti-oxidant, digestive, anti-convulsant. It is also rich iron, potassium, calcium, manganese and zinc along with many vital vitamins including vitamin A, folic acid, riboflavin, niacin, vitamin-C that are essential for optimum health.

Sesame Seeds: The tiny flat seeds of a plant native to India, sesame seeds have a nutty, slightly sweet taste. Sesame seeds are used as a topping for bread and crackers. A paste made from the seeds (*tahini*) is combined with chickpeas to make hummus. Toast seeds before using them to enhance their flavor.

Medicinal value: Delicious, crunchy sesame seeds are widely considered healthful foods. They are high in energy but contain many health benefiting nutrients, minerals, antioxidants and vitamins that are essential for wellness. It prevents coronary artery disease. The seeds are also very good source of dietary proteins with fine quality amino acids that are essential for growth, especially in children. Many of the minerals

found in it have vital role in bone mineralization, red blood cell production, enzyme synthesis, hormone production, as well as regulation of cardiac and skeletal muscle activities.

Star anis: Star anise comes by its name honestly, with its star shape and a licorice taste similar to regular anise, only stronger. Star anise is the seed pod of an evergreen tree (*Illicium Verum*) grown in southwestern China and Japan. It is about one inch high with eight segments and a dark brown rust color. Like regular anise, star anise gets its distinctive licorice taste from a chemical compound called *anethol*. Star anise plays a key role in the slow cooked dishes that characterize Eastern Chinese cuisine. Its licorice flavor enhances red cooked dishes, as well as eggs simmered in black tea. Star anise is one of the spices in five-spice powder.

Medicinal value: In traditional Chinese medicine, star anise is prescribed as a digestive aid and to help cure colic in babies. More recently, *Shikimic Acid*, extracted from star anise, is one of the chief ingredients in the antiviral Tamiflu drug used to fight avian influenza.

Peppercorns: Despite the name, these dried berries are not related to traditional black peppercorns. They come from a type of ash tree and have a peppery, somewhat citrus taste. Popular in Indian and Chinese cuisine, peppercorns often are mixed with salt or used as a flavoring for cooking oils. This flavored oil also can be used as a salad dressing.

Medicinal value: One of the popular ingredients of East Asian cooking, the peppers are indeed very rich source of essential oils, minerals, vitamins, and antioxidants. They also aid in the digestion power by increasing gastro-intestinal juice in the gut. Peppercorns are also good source of vitamins such as vitamin A, carotenes, pyridoxine, and thiamin and minerals like copper, potassium, iron, manganese, phosphorous, selenium and zinc.

Turmeric: Deep yellow in color, this spice is made from a root related to ginger. It has a sharp, woody taste. Widely used in Indian cuisine, turmeric is added to potatoes and light colored vegetables for both taste and its yellowish orange color. Turmeric can be substituted for saffron.

Medicinal value: The root has been in use since antiquity for its anti-inflammatory (painkiller), carminative, anti-flatulent and anti-microbial properties. *Curcumin*, a poly-phenolic compound, is the principal pigment that imparts deep orange color to the turmeric. It has anti-tumor, antioxidant, anti-arthritis, anti-amyloid, anti-ischemic, and anti-inflammatory properties. This popular herb contains no cholesterol; but is rich in anti-oxidants and dietary fiber, which helps to control blood LDL or "bad cholesterol" levels. It is very rich source of many essential vitamins such as **pyridoxine** (vitamin-6), choline, niacin, and riboflavin etc, which are essential for optimum health. Fresh root contains very good levels of vitamin-C. It is a water-soluble vitamin and a powerful natural anti-oxidant; helps body develop immunity against infectious agents. Turmeric contains very good amounts of minerals like calcium, iron, potassium, manganese, copper, zinc, and magnesium. Potassium is an important component of cell and body fluids that helps controlling heart rate and blood pressure.

Vanilla: A spice usually sold in liquid form, vanilla is extracted from the dried seed pods (beans) of a tropical plant belonging to the orchid family. It has a sweet, rich scent and flavor. Added to cookies, cakes, and other baked goods, vanilla is a widely used flavoring for ice cream, desserts, and coffees. Check the label to make sure you are getting real vanilla extract. Real vanilla extract, which has far more flavor than synthetic vanilla flavorings, is also much more expensive. “Vanilla” brought back from tropical areas may contain *coumarin*, a harmful substance that can cause kidney and liver damage.

Medicinal value: The main chemical components in the beans are *vanillin* and numerous traces of other constituent. Vanilla drink was thought to have aphrodisiac qualities, however no research studies establishes its role in the treatment of erectile dysfunction. The extract contains small amounts of B-complex group of vitamins such as niacin, pantothenic acid, thiamin, riboflavin and vitamin B-6. These B-complex groups of vitamins help in enzyme synthesis, nervous system function and regulating body metabolism. This spice also contains small traces of minerals such as calcium, magnesium, potassium, manganese, iron and zinc. Potassium in an important component of cell and body fluids that helps control heart rate and blood pressure. Manganese and copper are used by the body as co-factors for the antioxidant enzyme superoxide dismutase. Iron is essential for red blood cell production and as a co-factor for cytochrome oxidases enzymes.

CHECK YOUR PROGRESS -I

Q.1 What do you mean by herb?

Q.2. What is the medicinal value of rosemary?

Q.3 What is asafoetida?



Figure 3.1 Varieties of Herbs



Figure 3.2 Varieties of Spices

3.4 Cereals

Cereal crops or grains are mostly grasses cultivated for their edible grains or fruit seeds. The word 'cereal' is derived from 'Ceres', the name of the pre-Roman goddess of harvest and agriculture. Cereal grains supply most of their food energy as starch. They are also a significant source of protein, though the amino acid balance, with exceptions as noted below, is not optimal. Whole grains are good sources of dietary fiber, essential fatty acids, and other important nutrients. Rice is eaten as cooked entire grains, although rice flour is also produced. Oats are rolled, ground, or cut into bits (steel-cut oats) and cooked into porridge. Most other cereals are ground into flour or meal, which is milled. The outer layers of bran and germ are removed. This lessens the nutritional value but makes the grain more resistant to quality deterioration and makes the grain more appealing to many palates. Once (optionally) milled and ground, the resulting flour is made into bread, pasta, desserts, *dumplings*, and many other products. Besides cereals, flour is sometimes made from potatoes, cassava, cooking banana, chestnuts and pulses (especially chickpeas, which is known as besan). Cereal grains are grown globally in extensive areas covering millions of hectares and provide more energy worldwide than any other type of crop; they are therefore staple crops. In developed nations, cereal consumption is moderate and varied but still substantial. The cereal grains belong to the monocotyledonous family, *Gramineae* or grass family. The word cereal is derived from the word *Ceres*, the Roman Goddess of grain. The principal crops are rice, wheat, maize or corn, jowar, ragi.

3.4.1 Cereal Varieties

Grains form the base of the Food Grid Pyramid, and nutritionists are constantly nagging us to eat more of them. Sure they're a bit bland, but they're high in nutrients, low in fat, and "dirt are cheap." Cooks usually consign grains to supporting roles, letting them absorb the flavors of other ingredients while adding texture and body to food. It often helps to toast grains briefly before cooking them so as to bring out the flavor and speed up the cooking time. Most grains have been processed (post-harvest handling) by the time they reach us. The first step at the mill is to remove the inedible outer hull, yielding what's called a whole grain, berry, or groat. Whole grains are nutritious, but they're chewy and slow to cook. To counter that, the nutritious bran layer beneath the hull is sometimes scoured off as well, resulting in a pearled or polished grain. Whole or polished grains are then sometimes ground, rolled, or chopped into flakes, small grits, meal, or flour. The following are major cereal grains used worldwide:

3.4.1.1 WHEAT

It belongs to the genus *triticum* with 30,000 families. The kernel is 1/8 –1/4 inch long, ovoid in shape, rounded in both ends. Along one side of the grain there is a crease, a folding of the *aleurone* and all covering layers. Wheat is consumed mostly in form of flour and small quantity s used in breakfast foods such as wheat flakes and puffed wheat. It is converted into flour for the production of bread and other bakery products. It is used as "chapatti" (unleavened pan-baked bread) in India. Owing to its high price, the use of wheat for industrial purposes and animal feed is very limited.

Composition:

Carbohydrate	95 %
Proteins	5 %

Minerals	3%
Vitamins	1 %
Water	1 %

PREPARATION OF RAW WHEAT

Milling: In India milling is done through stone grinding, but modern flourmills are with more mechanized to give pure wheat flour. The process involves the following:

1. Vibrator screen- (Thresher) – this removes bits of straw and other coarse materials and the second screen sieves foreign materials like unwanted seeds.
2. Aspirator – Here the wheat is cleaned by suction. The stream of air sucks lighter impurities like dust and stones.
3. Disc separator – catches individual grains of wheat but rejects larger or smaller materials.
4. Scourer – In this the beaters attached to the central shaft throws the wheat violently against the surrounding drum, resulting breaking of kernel hairs.
5. Magnetic separator – pulls out any metal particles present.
6. Washer stone – Here the wheat is washed, resulting precipitation of stones, clay and lighter materials float leaving only clean wheat.
7. Tempering – In this the wheat is exposed to moisture and then dried.
8. Entoleter – In this the degraded quality kernel is removed.
9. Grinding bin – Here the first break of wheat takes place
10. Shifter – Here the flour is shifted through cloth or fine sieve, giving wheat flour.
11. Purifier – in this the coarse grains are subjected to controlled flow of air, which lifts the bran leaving behind refined grains, which are separated, again by their size and quality.
12. The down purifier – Here the final shifting is done and the grains are separates

The process is repeated over and over again. Shifters, purifiers reducing the rolls until the maximum amount of flour is separated consisting of at least 72 % of wheat.

Flour is considered as the ground form of any cereal. In this topic we are going to learn about wheat flour

Composition of flour:

Flour contains the following ingredients:

Starch	70%
Moisture	14%
Protein	11.5%
Ash	0.4%
Sugar	1%
Fat or lipid	1%
Others (enzymes- α and β amylases)	2.1%

Types of Flour

Name	Description
Whole-meal flour	It is the whole milled wheat kernel. The flour is cream to brown in colour as it is grounded including the entire kernel. Because they contain bran, whole-grain flours have much more fiber than refined white all purpose flours. The presence of bran reduces gluten

All purpose The all purpose flour is a blend of flours and has medium

flour	strength. It is also called refined white flour. It is the most widely used flour, where the endosperm only is grounded finely and the bran and germ is removed. It is a combination of hard and soft wheat and contains maximum of iron, Vitamin B, niacin and folic acids. Virtually there is no change in colour, texture, taste baking quality and calorific value while baking. It is also called bread flour.
Weak flour/cake flour	It is finely milled soft wheat flour. This flour has high starch content less and gluten than all purpose flours and hence, it is used for products that need a softer texture such as cookies and cakes and sponges.
Self-raising flour	This is also a type of all purpose flour, where baking powder is added in proportion to the flour. It is of medium strength and high in sodium. This flour is commonly used in pre-packaged mixes, such as cakes mixes and biscuit mixes and is used in home cooking.
Enriched flour	It is similar to all purpose flour, but bleached to whiten the appearance. Then they are fortified with nutrients. These flours have long shelf life and are used in making cakes and speciality bakery products.
Strong flour	It is milled from high protein hard wheat. The strong flours absorb more water than weak flours, as gluten can absorb twice their own weight of water. This flour is used for products which will have a high rise in the oven such as yeast breads, choux pastry, and puff pastry. Strong flour is also known as baker's flour.
Pastry flour	It is a very finely ground polished wheat flour of soft wheat kernels, They have high starch content and may be bleached or unbleached. Its gluten content is greater than cake flour and is used in preparation of flaky pie crust, cookies, biscuits, and sorted pastries.
Bromated flour	Bromides added to flour help to ensure consistent results in baked goods. The bromides help to strengthen the flour to achieve optimum gluten formation for bread making.
Graham flour	This flour is named after Dr. Sylvester Graham of USA, who advocated the use of whole wheat flour in early 1800s. The wheat kernels are grounded finely and the bran and germ is separated. This separated bran and germ is again finely grounded and mixed with the endosperm flour.

Functions of Flour

a. Provides structure: Flour is the principle ingredient for toughening or structure

building in baked goods. Structure allows products to hold a new, larger size air cavities they expand and leaven. It prevents products from collapsing once they are cooled and removed from the pan. When flour is added to moisture, gluten strands expand resulting the expansion (*gelatinization*) of starch and gums present, this is the starch and the gum that finally provides the required structure of baked products. Flours with lesser gluten and moisture rise less, as in case of cakes, where as flours with very little or no gluten and less moisture expand to minimum, as example of pie crust and crisp cookies.

b. Absorbs liquids: Ingredients like flour that absorb liquids are also called driers. Starches, proteins, and gums are the three main components in flour that absorb moisture (water) and oil, helping to bind ingredients together. The absorption value of flour is an important quality factor in bread baking. Water absorption values of most bread flours range around 50–65 percent, meaning that 1 pound (450 grams) of flour absorbs over 0.5 pound (225 grams) of water. While several factors affect the absorption value of flour, doughs that absorb more water typically have higher protein content.

c. Contributes flavour: Clean and full bodied wheat flour has mild and nutty flavour which is generally considered desirable for bakery products.

d. Contributes colour: Flours vary in color. For example, regular whole wheat has a nut-brown color, whole white wheat flour has a golden color, durum has a pale yellow color, unbleached white flour a creamy color, and cake flour a stark white color. These colors carry over to the color of baked goods.

e. Adds nutritional value: Essentially all flours and grain products contribute complex carbohydrates (starch), vitamins, minerals, and protein.

Uses of Wheat Products:

- Soft flour- cakes, biscuits, all pastes except puff and flaky, thickening soups and sauces, batters and coating various foods.
- Strong flour- bread, puff and flaky pastry, and pasta.
- Whole meal flour- whole meal bread and rolls.
- Gnocchi, milk puddings.
- Macaroni and spaghetti – soups ,pasta dishes, garnishes.
- Noodles- garnishing soups, pasta dishes, meat dishes.
- Refined flour (maida) – loaf, breads and nuns, sweets.
- Semolina – Halwa. Pasta.
- Cracked wheat- porridge.

3.4.1.2 RICE

It is the staple diet of half of the world's population. The germ, the pericarp and aleurone, which are richer than endosperm in nutrients like proteins, minerals and vitamins, are separated from the grain during milling along with the husk.

Composition:

Carbohydrates	72 – 75 %
Proteins	7%
Minerals	8 % (iron, phosphorus, calcium and trace elements)

Enzymes	amylase, protease, lipase, oxidases, phenolases
Pigments	anthocynins and carotenoids

There are three main types used:

- **Long grain** – a narrow, pointed grain, best suited for savoury dishes and plain boiled rice because of its firm structure, which helps to keep the rice grains separate, e.g. Basmati, Parmal.
- **Medium grain**- all-purpose rice suitable for sweet and savoury dishes, e.g. Carolina, Arborio.
- **Short grain**- a short, rounded grain, best suited for milk puddings and sweet dishes because of its soft texture, e.g. Arborio.

Types:

- **Brown Rice** – any rice that has had the outer covering removed but retains its bran and as a result is more nutritious.
- **Whole grain rice**- whole and unprocessed rice.
- **Wild rice**- seed of an aquatic plant related to the rice family.
- **Ground rice**- used for milk puddings.
- **Rice flour**- Used for thickening certain soups, e.g. cream soups.
- **Rice paper**- a thin edible paper produced from rice, used in the preparation of macaroons and nougat.
- **Precooked instant rice**, par boiled, ready cooked and boil in the bag is also available.

PREPARATION OF RAW RICE:

Milling: Paddy is milled in India either by home pounding or mechanized rice mills. In this rice grains are passed through two stone or rubber discs rotating in different speeds and by sheering action, the hull is pulled away, resulting in Brown rice. The brown rice is then milled through peelers to remove the outer bran and germ by the process of rubbing, resulting unpolished milled rice. This rice is then polished with brush machine, which removes the aleurone layer and yields “polished rice”. The degree of milling determines the amount of nutrients removed. Percentages of losses during milling are proteins 15 %, fat 82 %, thiamine 85 %, riboflavin 70% and pyridoxine 50 %.

Par-boiling: Parboiling is particularly good in the case of coarse and medium rice of soft structure because such rices suffer excessive breakage when milled raw. The process involves:

Method 1

1. Soaking (steeping) the grains for 2 – 3 days.
2. Steaming for 5 – 10 minutes.
3. Drying in the sun.

Method 2

1. Soaking the grains in water at 65 – 70⁰C for 3 - 4 days.
2. Draining and steaming for 5 – 10 minutes in the same vessel.
3. Drying in the sun or mechanical driers.

Advantages of Par-boiling

- De-husking rise is easy as the grains become tougher than the bran.
- This rice has greater resistant to insects and fungus.

- Loss of nutrients is decreased as the minerals and vitamins seep into the endosperm during par boiling.
- Improves digestibility.
- It swells more when cooking.
- It stabilizes the oil content of the bran.

Dis-advantages of Par-boiling

- Sometimes it emits unpleasant smell and hence not preferred.
- Color changes occur during par boiling.

Rice products:

1. **Boiled rice** – plain, pulaos, Biriyanis.
2. **Rice Starch:** granules are quite small and are embedded in a protein matrix. Rice starch is used in puddings, ice-creams and custard powder. It forms a tender opaque gel. Also used as a binding agent and thickening agent.
3. **Rice Bran-** Breakage of the white rice kernel during milling also results in small fragments of the endosperm becoming part of the bran fraction. It can be used in the preparation like bread, snacks, cookies, and biscuits. In addition rice bran is a very rich source of dietary fiber so it is an effective stool bulking agent.
4. **Rice Bran oil-** This oil is rich in Vitamin E which gives oxidative stability to the oil. In addition it has higher cholesterol lowering effect than other oils. It is used for human consumption (rich in vitamin E) and soap making.
5. **Parched Rice products** – About 4-5 % of total supplies of rice in India is converted into rice products- parched rice, parched paddy and rice flakes. Parched Rice-parboiled rice is used in making parched rice. Parched rice (murmura) is a crisp product with a grayish to brilliant white colour and is sold either salted or unsalted. It is eaten as such or mixed with butter milk and then consumed.
6. **Flaked Rice** – or chura is made from parboiled rice, the husk is separated and is thin and papery and of white colour.
7. **Various types of savories.**
8. **Sweets-** like modak, kheer
9. **Wine-** used mainly in South Asian and Chinese cuisine
10. **Noodles-** Chinese/ Thai rice noodles
11. **Rice salads.**

Cooking rice:

Rice expands approximately three times when boiled, so careful calculations should be made to achieve the appropriate quantity of cooked rice. Always put rice in boiling water with little salt. Salt improves color, texture and taste.

The objective when cooking is to keep separate and fluffy.

Two methods of cooking rice are:

- **By draining method** – in which excess water is drained - where most of the nutrients are thrown away. For proper cooking rice is cooked up to 90 % and then drained and kept tightly covered with a lid for 10 minutes.
- **By absorption method** – Here less water is used – generally the ratio is two is to one. Here water is completely absorbed. Cooking rice with this method needs careful consideration and skill, as one should know the quality of rice is being used and the amount of moisture it will absorb.

Storage: Rice should be stored in cool, well ventilated place away from moisture or the reach of rodents.

3.4.1.3 MAIZE

It is extensively cultivated throughout the world. It is usually eaten as such when it is raw and tender. It is available as maize flour and breakfast cereal like cornflakes. Corn oil and cornstarch made from maize are also used in cooking. Maize is also known as corn, sweet corn or corn-on-the-cob, and also can be served as vegetables.

Varieties of corn:

- **Baby corn** (Chinese baby corn)-These are tiny ears of corn that are eaten cob and all. Asian cooks like to add them to stir-fried dishes, and they often show up in salad bars. It's hard to find them fresh, but many markets sell them in cans or jars.
- **Popcorn**-Air-popped popcorn is a very popular snack that's high in fiber and low in fat - assuming that you don't add lots of butter and salt.
- **Purple corn** (Maiz morado)-Peruvians use this to make beautiful purple drinks and puddings.
- **Indian Corn**-It is more of an ornamental corn used for decoration during festival seasons. Kernels or the cob variation in colour and therefore used in decoration and for eating.

Composition:

Protein	11 %
Carbohydrate	70 %
Water	20 %

Other minerals and vitamins

Processing:

Dry milling – The grains are grinded in roller mills to obtain flour. Oil is obtained from germ cells. Large as well as small grits are pounded to prepare cornflakes and breakfast cereals.

Wet milling – In this corn syrup and ethanol is produced.

Products of Maize:

De-germinated flour-It is used by brewers as a starch medium for the action of barley malt in the preparation of wort for the production of beer.

Corn germ oil: The fat content of maize is 3.6 % and oil extracted from it can be refined to produce a high quality vegetable oil for cooking or food use.

Popcorn: The popping of corn is a method of starch cookery. Popping can be done with or without fat.

Cornflour: Cornflour is produced from maize and is the crushed endosperm of the grain which has the fat and protein washed out so that it is practically pure starch. It is used for making custard and blancmange powders, because it thickens very easily with a liquid, and sets when cold into a smooth paste that cannot be made from other starches.

Corn starch is used for thickening soups, sauces, custard, as binding agents and also in the making of certain small and large cakes.

3.4.1.4 OATS

Oats are highly nutritious and filled with cholesterol-fighting soluble fiber. They also have a pleasant, nutty flavor. Oat is the only cereal containing a globulin or legume-like protein, *avenalin*, as the major (80%) storage protein. Globulins are characterized by water solubility; because of this property, oats may be turned into milk but not into bread.

Most of us are familiar with rolled oats, which are used as a hot breakfast cereal and cookie ingredient, but many health food stores also stock oat groats and oat bran.

Oat varieties:

- Instant oats (instant oatmeal)-These are very thin, precooked oats that need only be mixed with a hot liquid. They usually have flavorings and salt added. They're convenient, but not as chewy and flavorful as slower-cooking oats.
- Oat groats-Oat groats are minimally processed- only the outer hull is removed. They're very nutritious, but they're chewy and need to be soaked and cooked a long time.
- Quick oats-These are thin flakes of oatmeal that cook up in about three or four minutes. They're a good choice for oatmeal cookies. Sweetened porridge with milk is a good breakfast cereal.

3.4.1.5 JOWAR

or sorghum millet are grown in Uttar Pradesh, Maharashtra, Karnataka, Madhya Pradesh, Andhra Pradesh, Gujarat and Tamil Nadu. These are easily digestible grains so they are recommended for small children.

Nutritive value:

Rich in proteins, carbohydrates and minerals and vitamin B complex vitamins. Poor in Vitamin A but richer in fibers.

Processing:

Involves wet milling, where top layer being the color and fiber is removed by abrasion

Uses:

- Used in making bread or bhakari.
- Some jowar is consumed parched.
- Malted jowar is used in infant foods

3.4.1.6 BAJRA

Among millets, bajra is the predominant crop in India Has almost the same quality as wheat, but it also rich in Iron, thiamine, riboflavin and niacin.

They are de-husked and polished and cooked in the same way as rice.

Uses:

- They can be cooked as rice or parched or milled to flour to prepare roti or bhakari.
- Sometimes eaten as parched
- The grain is suitable for the preparation of malt.

3.4.1.7 RAGI

Ragi is known as finger millet constitutes over 25% food grains in India. Pulses are considered as poor man's meat due to their high protein content ranging from 20 to 40% and this makes them important in human food from nutrition point of view. It is

widely consumed practically without any refining by the poorer section of the population. Nutritionally it is almost as good as or better than wheat or rice. The major proteins of ragi are *prolamins* and *glutelins* and they appear to be adequate in all the essential amino acids. Ragi is rich in minerals especially calcium. It is also rich in fiber. It is also rich in phytate and tannin and hence interferes with mineral availability. It contains B-vitamins but is poor in B₂.

Processing-Milled by wet milling process, parboiling of ragi helps in the quality of ragi dumpling by eliminating its slimy texture.

Uses:

- Flour from puffed ragi has good flavour and can be used in snacks and supplementary foods.
- In south India ragi is used as gruel, dumpling, roti, dosa or as porridge.
- Malting
- They can be par-boiled like rice.
- Preparation of milk beverages

3.4.2 Selection of Cereals

1. It is important to select the cereals wisely before purchasing them. For proper selection, keep the following guidelines in mind:
2. Grains should be clean, free from dirt, grit, gravel etc.
3. Grains should look fresh, with proper shape and size.
4. They should not be infested with moulds, insects or fungus.
5. Grains or flours should be preferably bought from cooperative stores, Grahak Sangh, or any other Cooperative organization to ensure good quality materials.
6. Whole wheat should be purchased and ground for use by the families themselves, to prevent from the purchase of adulterated flour from the market.
7. Maida should be free from insects, lumps and moulds.
8. Puffed rice or chiwra should be crisp and not have gravel, grit and sand.
9. Good quality dalia is free from moulds and bad odor.
10. Select according to your needs. Thin long variety of rice is used for making pulao, while short varieties are suitable for khichri, idli, dosa, etc. Finer variety of suji is suitable for halwas while larger particles are better for upma.
11. Breads should be fresh and wrapped in a hygienic package. Good quality bread is soft and has good flavour.

3.4.3 Storage of Cereals

- Cereals, if whole should be stored in bags, in cool and dry place away from moisture.
- The place should be devoid from cracks or holes and made of concrete.
- Some anti-fungal and anti-repellent medicines are kept along with the grains to keep fungus, insects and rodents away.
- Milled cereals should be properly packed in airtight containers and kept in cool and dry place.
- Inspect the stored cereals at regular intervals.

3.4.4 Role of Cereals in Cookery

- Being comparatively inexpensive, cereals form the staple diet and contribute to most of the calorie requirements and half of the protein requirement.
- Cereals improve the quality of pulse proteins. Since they are excellent source of starch and B vitamins, no meal can be made without cereals.
- As pulaos breads, chapattis, loaf etc.
- Cereals are used as thickening agents e.g. corn flour in custards and soups, rice flour in pulse, vermicelli in payasam, maida in white sauce, macaroni in soups.
- As coating agents, e.g. maida paste in cutlets or bread crumbs in cutlets.
- Puffed – chiwra
- Parched – murmura,
- As beverages - malted beverage, rice wine.
- Cereals as desserts – Rice kheer, wheat halwa
- As outer coverings of samosa, and poli.
- Fermented foods – idli, dhokla.

Prevention of lumps

The direct addition of dry starch to boiling liquid causes lump formation. This is caused because as soon the starch powder comes in contact to the hot liquid, the outer layer gelatinizes and becomes sticky, preventing water to go inside.

Lumps can be prevented by: -

1. **Agitation** - Flour should be added slowly with constantly stirring so that each particle gelatinizes separately and get dispersed well.
2. **Flakes and granules** – Instead of flour, if flakes or granules are added, they will not gelatinize immediately as their particles are bigger and hence no lump formation will take place.
3. **Paste** – Cold-water paste is made of flour and then added to the hot liquid.
4. **Below boiling point** – Cereal flour should be added to the liquid below the boiling point so as all the particles get dispersed before gelatinization.
5. **Addition of fat** – If the particles are sautéed / fried in fat, all the particles get coating of fat and stickiness and lump formation is avoided.
6. **Addition of sugar** – Sugar competes with water and decreases gelatinization and lump formation.

3.5 Pulses

Pulses are edible fruits or seeds of pod bearing plants belonging to the family of the leguminous. The major pulses which find important place in our dietaries are red gram dhal, Bengal gram dhal, black gram dhal, green gram dhal and massor dhal. Some are used as whole grams. Cow peas, rajamah and dry peas also belong to leguminous family. Legumes not only have dietary values but also play an important role in maintaining or even improving soil fertility through their ability to fix atmospheric nitrogen

3.5.1 Varieties of Pulses

1. **Dry beans:** Dry bean is high in starch, protein and dietary fiber and is an excellent source of iron, potassium, selenium, molybdenum, thiamine, vitamin B6, and folic acid.

Example: Black bean

1. White kidney beans
2. Fava bean or butter beans
3. Flageolet beans
4. Lablab beans
5. Mung bean (green gram)
6. Rattlesnake bean
7. Red kidney beans (Rajma)

2. **Dry broad beans:** Broad beans are eaten while still young and tender. The beans can be fried, causing the skin to split open, and then salted and/or spiced to produce a savory crunchy snack. These are popular in China, Peru (habas saladas), Mexico (habas con chile) and in Thailand (where their name means "open-mouth nut").

Example:

1. Horse bean
2. Broad bean
3. Field bean.

3. **Dry pea:** Dry pea is an annual pulse, legume crop that is consumed throughout the globe. It is usually used in split form and forms integral part of various cuisines of the world. The pea is obtained as seeds from the pod of the pea plant and is dried in the sunlight to produce dry pea.

Example:

Green peas

4. **Chick pea:** The chickpea (also called Indian pea, chana or channa) is an edible legume. It is used as a source of protein by vegetarians and vegans since it has one of the highest protein levels of all plants.

Example:

Chick pea (chana)- desi or kabuli

5. **Cow pea:** Dry cowpea also called black-eyed pea or black eye bean or China bean or Southern pea is originally from China.

Example:

Soya beans

6. **Pigeon pea:** Pigeon peas are both a food crop (dried peas, flour, or green vegetable peas) and a forage / cover crop. The dried peas may be sprouted briefly, and then cooked, for a flavor different from the green or dried peas. Sprouting also enhances the digestibility of dried pigeon peas via the reduction of indigestible sugars that would otherwise remain in the cooked dried peas.

Example: Toor (Arhar) dal

7. **Lentil:** Like other legumes, lentils are low in fat and high in protein and fiber, but they have the added advantage of cooking quickly. Lentils have a mild, often earthy

Q.3 What is cornflour ?

3.6 Fruits

Fruits may be classified into 8 categories:

Uses of Fruits:

1. As juices
2. For grilling (P/A, Bananas. Grapefruits)
3. Baking
4. Sautéing
5. Deep-frying
6. Poaching
7. As salads
8. Jams and jellies

Purchasing of vegetables and fruits:

- In general, many fresh commodities must necessarily be shipped in firm condition, such as pears, tomatoes,

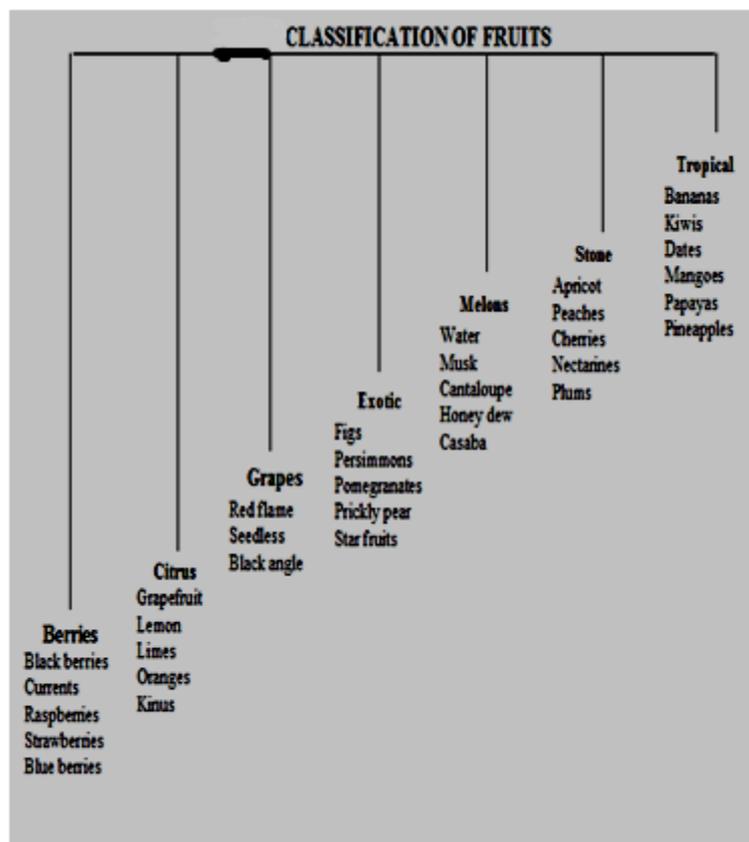


Figure 3.3 Varieties of Spices

cauliflower, avocados and tomatoes. Better retailers are conditioning these products to just the stage of ripeness the consumer likes - by the time they arrive at the point of sale.

- Check the characteristic signs of freshness such as bright, lively color and crispness. Vegetables are usually at their best quality and price at the peak of their season.
- Demand freshness! Check the characteristic signs of freshness such as bright, lively color and crispness. Vegetables are usually at their best quality and price at the peak of their season.

- Buy mature fruit. A green peach or nectarine, for example, will not ripen but merely soften some and wither. A cantaloupe picked too green will
- soften but will not be sweet and juicy. Some commodities do not gain sugar after harvest, because they have no reserve starch for conversion to sugar. On the other hand, bananas and pears gain sugar as well as tenderness after harvest.
- Handle with care. Fresh fruits and vegetables, because of their perishability, require constant attention to keep their fresh appearance. The less you handle them when purchasing, or in the home, the longer their life. Don't pinch, squeeze or poke them., for bruising leads to damage and damage results in more spoilage for you or your retailer.
- Use thoughtful care to prevent injury to vegetables. Some vegetables are more hardy than others, but bruising and damage can be prevented by just being careful. The consumer pays for carelessness in the long run.
- Don't buy because of low price alone. It doesn't pay to buy more vegetables than you can properly store in your refrigerator or use without waste. Most fresh vegetables can be stored for 2 to 5 days, except for root vegetables, which can be stored from 1 to several weeks.
- Avoid decay. It's a waste of money to buy fresh vegetables affected by decay. Even if you do trim off the decayed area, rapid deterioration is likely to spread to the salvaged area. Paying a few cents extra for vegetables in good condition is a good investment.
- Some vegetables are labeled with a FPA quality grade. The quality of most fresh vegetables can be judged reasonably well by their external appearance. Therefore, consumers can usually make a good selection of vegetables from retail display counters even without the help of a grade mark or other identification of quality. Vegetables are available year-round from both domestic production and imports from other countries.

3.7 Vegetables

The term vegetables refer to any herbaceous plant that can be wholly or partially eaten. The parts which can be consumed include may be items, leaves, buds, roots, tubers, seeds and flowers. Vegetables contain more starch, fibers and less sugar than fruits, so they tend to be savory than sweet and are generally eaten cooked unlike fruits which are eaten raw. Vegetables are in particular divided into 9 categories-cabbages, fruit vegetables, gourds, squashes, greens, mushrooms and truffles, onions, pods and seeds, roots and tubers and stalk. But in broadly they can be classified into three categories: 1. Root vegetables 2. Leafy vegetables 3. Other vegetables grown above the ground (Fig 9.1).

- a) **Root vegetables:** - grown underground, should be firm, heavy, and crunchy, free from earth and grub. E.g. Carrots, onions, potatoes, yam, kohlrabi, garlic truffles etc.
- b) **Leafy vegetables:** - should be crisp and crunchy without any blemishes and cuts. E.g. Parsley, cabbage, spinach, mustard, sorrels and leeks etc.
- c) **Other vegetables:** - include those which are grown above the ground, on the stem or in the pods. E.g. Cauliflower, brinjal, green peas, tomatoes etc.

Cooking vegetables

We cook vegetables so that they can be

- Easily digestible- as the fibers breakdown with the effect of heat.
- Easily mastic able- can be chewed easily
- Equal distribution of minerals and nutrients in all parts of the vegetables- as some useful ingredients are present in the skin of the vegetables and when they are cooked, they dissolve in water and get inserted in the flesh of the vegetables.
- All harmful bacteria and microorganisms are killed with the effect of the heat.
- To preserve them.
- To improve color and texture of the vegetable.
- To improve the flavor and palatability of the vegetable.
- To remove harmful alkaloids.
- Vegetables should be cooked just before service, so that they are not overcooked and have become soggy.

- If cut unprepared vegetables are needed to be stored, they should be blanched first and then refreshed in iced water and then stored in fridge.

- Green colored vegetables must be cooked by adding a pinch of cooking soda (soda bicarbonate) to

retain its color. *Chlorophyll* on cooking losses magnesium which holds the color). The rest of the nutrients present make the vegetables dull brown in color.

- Either alkali or acids do not disturb *Carotenoids* in vegetables and therefore their colors are not disturbed while cooking.
- White and red vegetables (which have flavanoids pigments) must be cooked by adding a small amount of acid like vinegar or lemon juice to retain its colour.
- When preparing assortment of vegetables, cook each vegetable separately or one after the other, together in the same liquid depending upon their toughness, so that the final product has all the items evenly cooked.

Some continental vegetables			
Broccoli	Asparagus	Brussels Sprouts	Marjoram
Kale	Lettuce	Kohlrabi	Truffles
Avocado	Tomatillos	Artichokes	Sorrels
Endive	Shallots	Leeks	Fennels
Celery	Jimca	Parsnips	Jalapeños
Some Indian vegetables			
Brinjal	Tomatoes	Cauliflower	Gr. chilies
Okra	Radish	Cabbage	Mustard
Pumpkin	Rhubarb	Fr. beans	Gr. peas
Capsicum	Spinach	Bitter gourd	Onions
Green coriander	Turnips	Bottle gourd	Mushrooms

Figure 3.4 Varieties of Vegetables

3.8 Salt

These are chemical compound (other than water) formed by a chemical reaction between an acid and a base. Salt for human consumption is produced in different form sun refined salt (such as sea salt), refined salt (table salt), and iodized salt. It is a crystalline solid, white, pale pink or light gray in color, normally obtained from sea water or rock deposits. Edible rock salts may be slightly grayish in color because of mineral content.

Classification of salt:

- a. **Table salt**- Once of the most widely used salts, table salt goes through a refining process that removes traces of other naturally occurring minerals. Chemical additives such as sodium silicoaluminate, calcium phosphate, or magnesium carbonate are sometimes blended in to prevent clumping. Table salt and iodized salt are preferred in baking for their fine-grained texture and accuracy of measure.
- b. **Iodized salt**- A form of table salt, iodized salt is fortified with iodine that was lost during processing. Iodized salt was the first functional food, fortified in the early 1920s in response to a Midwest-focused epidemic of goiter (hyperthyroidism) that was caused by iodine deficiencies.
- c. **Kosher salt**- This inexpensive coarse salt is evaporated from a brine, usually under specific conditions approved by the Orthodox Jewish faith. It contains no additives or added iodine. It has a much larger grain size than some common table salt. Like common table salt, kosher salt consists of the chemical compound sodium chloride.
- d. **Sea salt**- Available in both fine and coarse grains, sea salt has become increasingly available in markets but at a higher cost than table or kosher salt. Sea salt is made from evaporated sea water. Some salt farmers evaporate the water in enclosed bays along the shoreline, then rake up the salt by hand.
- e. **Rock salt**- Sold in large crystals, rock salt has a grayish hue because it is unrefined. Rock salt makes a great bed for serving oysters and clams. Or combine it with ice to make ice cream in hand-cranked ice cream makers.
- f. **Black salt or kala namak** or black Indian salt- is a salty and pungent smelling condiment used in India. The condiment is composed largely of sodium chloride with several impurities lending the salt its colour and smell. The smell is mainly due to sulfur content.
- g. **Smoked salt** is an aromatic edible salt product with smoke flavoring. It is a seasoning and is used as a shortcut to add smoked flavor to foods. Smoked salt consists mainly of sea salt and smoke volatiles condensed on the salt. An ingredient typically listed on smoked salt is sawdust.

Uses of salt:

1. Acts as preservative, as it acts on microorganisms, extracts the liquid from them and then kills them.
2. Acts as anti-raising agent- regulates the leavening processes in breads by controlling the action of yeast.
3. Acts as tenderizers- it breaks the cells and tissues of the flesh and makes it more tender to be cooked easily
4. Acts as taste enhancer
5. Preparation of brine solution for curing of meat, fish and poultry.

6. Solution of salt is applied inner walls of tandoor to give it more friction, shine and stability.
7. Helps to absorb food in intestine
8. Salt helps in increasing the body resistance towards any type of illness and disease.
9. Helps in regulation water content in the body.

3.9 Sweeteners

It is a class of sweet tasting carbohydrate in concentrated form of sucrose. It consists of a molecule of glucose combined with a molecule of Fructose. It is formed naturally in the leaves, stems, roots or fruits of plants. Sugar may be obtained from varied plants like from maple tree- Canada, date palm- Africa, sugarcane- tropical region, beetroots from temperate region and from sorghum, grapes, potatoes, honey etc. As it occurs naturally in nearly all plant structures, but for general commercial use. It is obtain from two major sources, the sugarcane and sugar beet.

Classification of Sugar: Sugars are classified under one or in the combination of following:

1. The source (sugarcane or sugar beet)
2. The country of origin
3. The method of processing, which in turn determine the type of sugar produced, e.g. cube sugar, icing sugar.
4. Catering use – specific type of sugar should purchase for particular use.
Chemical group - sugar may be classified in two chemical groups, mono and disaccharides.

Manufacture of sugar: The juices are taken out by crushing the plant part and then it is cleaned with the help of chemicals (milk of lime or carbon dioxide). It is then filtered and concentrated by evaporation under reduced pressure until crystallization occurs. The residue left after crystallization is called molasses (used mainly as cattle fodder). The crystallized sugar is further refined through bone ash to get pure opaque sugar. The different sizes of the crystals are produced by variation in boiling technique and duration.

Forms of Sugar:

1. **Turbinado sugar**- also called Demirara sugar. It is partially refined, light in color with coarse grain and caramel flavor. It is used in beverages and certain baked products.
2. **Lump sugar**- obtained by molding moist granulated sugar while hot. Used in restaurant and coffee shops.
3. **Sugar loaf**- sugar molded into cone shape.
4. **Icing sugar**- also known as confectioner's sugar. It is very fine sugar mixed with 3% starch powder (corn flour). Used in dusting, decorating, icing cakes and pastries.
5. **Castor sugar**- This is superfine sugar (A Grade) - made by crushing and sieving fine granulated quality granulated sugar. Used in making pastries, cakes, desserts, ices etc. It quickly dissolves in liquids and produces light and tender cakes.

6. **Granulated/ white sugar** - It is related as fine, the type most commonly sold or as ultra fine for the use in cake making or instant food product. It contains 99.7% sucrose
7. **Powder Sugar**- It is obtained from granulated sugar by pulverization (refining of granulated sugar to get more fine form). It is available in various degree of fineness, use for different purposes in confectionary.
8. **Brown Sugar**- It is simple refined sugar with some molasses returned to it. It is brown in color and has distinctive color and flavor. As it contains moisture , it forms lumps . Used in the preparation of certain puddings, cakes, etc.
9. **Sugar nibs**- Rounded grained sugar obtained by crushing blocks of white sugar – used in confectionary.
10. **Invert sugar**- Sugar obtained by the action of acids and enzymes (invertase on sucrose) – used in pastry.
11. **Candy sugar**- very large crystals of white sugar.
12. **Vergeoise sugar**- solid residue from refining beet or cane sugar giving a product of soft consistency, golden or brown with pronounced color.
13. **Glucose**- It is present in body and in fruits in natural form. Commercially it is sold as Dextrose. It is less sweet than sucrose, but it is use because of its waster holding capacity. It has ability to control the size of the crystals in candies and as a food for yeast, during the fermentation.
14. **Fondant**- sugar syrup beaten with cream of tartar to form thick white paste. Used for decorating pastry or confectionary.
15. **Liquid caramel**- liquid sugar.
16. **Pastillages**- Icing sugar mixed with gelatin, starch or gum. Used in decoration.
17. **Treacle/Molasses**- are products of refined sugar. Used in the preparation of sugar.
18. **Maltose**- It is use as a flavoring and coloring agent in the brewing of beer.
19. **Lactose**- It is commercially extracted solution of whey formed by crystallization. It is usually added to bakery products because its presence adds to the brewing of food products.
20. **Syrups**- These are liquids containing large amount of sugar. These are usually used to add flavour to the food products.
21. **Honey**-It is natural sugar consisting of glucose and fructose. It is used as leavening agents and in sherbets.
22. **Corn Syrup**-consists of glucose or dextrose. It is prepared by converting corn starch into simple sugar compound by the use of enzymes. Used in icing and candy masking.
23. **Malt syrup**- obtained by distillation of barley. Used in breads.

Uses of Sugar:

- Adds sweetness and flavour to the products..
- To colour the cooked products.
- Makes the texture firm and tender by weakening the gluten strands.
- To retain moisture and prevent in particularly baked goods such as cakes from drying out.
- Act as preservative.
- To help as an activator, sugar helps yeast to grow faster by providing it with a readily available source of nourishment.
- As anti-coagulant.

- As a main ingredient for cake decorating, e.g. different types of icing (topping the cake).

NOTE : “Rum is a form of sugar.”

Cooking of sugar:

Sl. No	Consistency	Temperature	Uses	Texture
1.	Coated	100° C	For fruits in syrup	Translucent coating
2.	Small thread	101° C	In almond paste	2-3 cm thread
3.	Large thread	102-103° C	Butter cream, icing	.5 cm thread
4.	Small pearl	103-105° C	Jams	Rounded bubbles
5.	Large pearl	107-109° C	Jams, glaces, icings	Bubbles with 2 cm threads
6.	Soft ball	116-118° C	Jam, jelly, nougat	Soft ball
7.	Hard ball	121-125° C	Fondant, meringue	Harder ball
8.	Soft crack	129-135° C	Toffee	Hard, sticky ball
9.	Hard crack	149-150° C	Candies, decoration	Brittle, not sticky
10.	Light caramel	151-160° C	Puddings, cakes, biscuits	
11.	Dark caramel	161-170° C	Cakes, sauces, stocks	

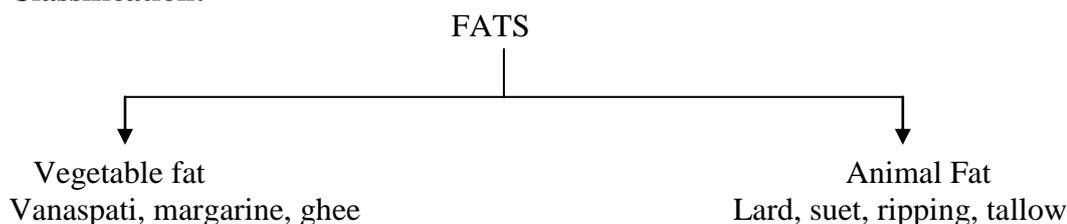
Procedure for cooking: Add some interferon’s (which prevent re-crystallization) like lemon juice, cream of tarter, vinegar etc.

Storage: Sugar is stored in cool dry place in bins and away from moisture.

CHECK YOUR PROGRESS -III

Q.1 What do you mean by pulses?

Classification:



Oils are obtained from plant products. E.g. mustard oil, soybean oil, sunflower oil, olive oil etc.

Nutritive value:

- One gram fat provides 9 k Cal of energy- so rich energy source.
- They provide vitamins A, D,E and K.
- Oils are important source of fatty acids.

Here is a list of common fats with short description and their uses:

ANIMAL FAT		
Name	Description	Uses
Lard	It is the inside fat of pig. Lard has almost 100% fat content.	Short paste, deep-frying, and shallow frying.
Suet	This is the hard solid deposit near the or around the kidney oof the animals. Beef suet is best than mutton suet. Fresh suet is firm, dry without any discoloration and blood strains.	Suet paste and also for frying purpose.
Ripping	This is obtained from classified animal fat.	Frying
Butter	Made by churning cream of milk.	Frying, sautéing, spread on breads.
Ghee	Made by clarifying butter	Frying, sautéing

VEGETABLEL FAT		
Name	Description	Uses
Vanaspati	This is Hydrogenated vegetable fat with addition of Vitamin A and D. Hydrogenation is done by passing hydrogen in the oil with the help of catalyst. It is white in pale yellow in color.	Frying, grilling, sautéing and in bakery. As shortening agent
Margarine	It is manufactured fat. It is made by emulsifying highly refined, deodorized and partially hydrogenated cottonseed, corn or soybean oil with pasteurized milk. It contains 80% fat. It is cheaper	Can be used, as substitute of butter, but only the smell is not so pleasant. It is used in bakery as shotening agent

and nutritious as it contains vitamins.

DIFFERENT TYPES OF OILS

Name	Source	Uses
Olive oil	Olive seeds	Used in preparation of sauces like mayonnaise, vinaigrette dressings and deep-frying.
Mustard oil	Mustard seeds	Deep-frying, shallow frying, sautéing
Sunflower oil	Sunflower seeds	Deep-frying, shallow frying, sautéing
Soybean oil	Soybean seeds	Deep-frying, shallow frying, sautéing
Groundnut oil	Groundnut seeds	Deep-frying, shallow frying, sautéing
Coconut oil	Coconut seeds	Deep-frying, shallow frying, sautéing
Til seed oil	Til seed seeds	Deep-frying, shallow frying sautéing
Maize oil	Maize seeds	Deep-frying, shallow frying sautéing

Changes in Fats and Oils on heating: Fats and oils give a rich flavor and texture to food and make it crispy. It also increases the energy value of food.

The fats and oils should not be heated to smoking point, as it starts decomposing with emission of blue smoke which is irritating and the vitamins are lost, and not good for health. If the fat is not heated properly, the food absorbs a lot of fat and becomes greasy. Less fat is absorbed during frying if high smoking fat is used.

Selection of Fats and Oils:

- Oils and fat should have natural flavour and colour.
- They should be clean and free from any solid particles, dirt, dust and bad odour.
- Buy fats or oil of a reputed company.
- Do not buy oils and fats loose, as they are likely to be adulterated. But in sealed tins or polyjars.
- Butter should be wrapped in a hygienic package. It should be firm and have a fresh flavour.
- Ghee should have its natural delicate flavour.

Storage of Fats and Oils: When fats and oils are stored for a long time, they become rancid by the action of air, water and enzymes. Rancidity leads to an undesirable change in the flavor and composition. These changes occur during storage of heated fats. Rancid fats tend to foam and rise when heated. To prevent rancidity, fry some potatoes or tamarind at the end, as they are believed to prevent spoilage during storage. Strain the fat or oil after frying to remove solid particles. Store fat in a closed

containers free of moisture in a cool place. Add some fresh fat or oil during storage or when the stored fat is to be reused for frying.

3.11 Milk and Milk Products

Milk may be defined as the whole fresh lacteal secretion obtained by the complete milking of healthy animals excluding that from the animals that are within 15 days or after 15 days of calving.

3.11.1 Composition of Milk

Types of consumption: There are two distinct types of milk consumption: a natural source of nutrition for all infant mammals and a food product for humans of all ages that is derived from other animals.

Other than cows and buffalo, milk can also be obtained from sheep, goats, horses, donkeys, camels, yaks, water buffalo and reindeer.

India is the largest producer of milk in the world followed by Finland, Sweden and Ireland. Whale's milk, though not used for human consumption has the highest fat content in mammals.

The other forms of milk are: The white juice and the processed meat of the coconut, crushed rice and soya in more-or-less liquid form, used especially in Thai, Indian, and Polynesian cuisine.

Nutritive composition: The milk contains calcium necessary for the bone formation and teeth. It contains certain vitamin such as vitamin A and D, vitamin B-1, B-12 and vitamin C the last one is smaller amount. It is also rich in protein fat and carbohydrate and the rest 87% is water.

- Human milk contains, on average, 1.1% protein, 4.2% fat, 7.0% lactose (a sugar), and supplies 72 kcal of energy per 100 grams.
- Cow's milk contains, on average, 3.4% protein, 3.6% fat, and 4.6% lactose, and supplies 66 kcal of energy per 100 grams.

3.11.2 Curdling Of Milk

Milk curdles naturally or made to curdle. Milk contains lactose and when raw milk is kept standing for few hours, the bacteria (lactobacillus) starts fermentation resulting the formation of lactic acid which causes the casein which is held in solution by the calcium to separate and to be simply thrown down without making further changes in a mass known as curds and the liquid left behind is called whey. Curdled milk is used to make cheese and curd. There are four periods of milk decay:

- Rancid (also called "on the turn". Milk is still consumable at this stage)
- Curdling (separation of curd and whey will occur but may still be consumable)
- Coagulation (beyond use. A period of aromatic decay sets in accompanied by mould)

- Dry (beyond use. The milk has dehydrated and become hard and chalky)

3.11.3 Milk Production

1. Pasteurized milk: Pasteurization is used to kill harmful microorganisms by heating the milk for a short time and then cooling it for storage and transportation. Pasteurized milk still is perishable, however, and must be stored cold by both suppliers and consumers. Dairies print expiration dates on each container, after which stores will remove any unsold milk from their shelves. The process destroys the vitamin C content of the raw milk. By this method the bacteria is killed and their action of sour producing is retarded. Pasteurization is done by two ways:

- 1) **Flash process:** In this milk is heated to 71.1°C (161° F) and then subsequently held for 15 seconds and then it is rapidly cooled below 48°C (50° F).
- 2) **Hold process:** In this the milk is heated to 63-65° C (145-150° F) and then maintain this temperature for 30 minutes and then cooled down immediately to 48° C (50°F)

2. Homogenized milk: In this milk and cream are mixed together briskly so that they do not separate when stand. This is done by subjecting the milk high pressure (2000 lb) per sq. inch through a small apparatus so that the fat globules are reduced in size and increase in number, which results in easy mixture and the fats do not rise above to the surface.

Advantages of homogenized milk:

- a) Do not need mixing of fat and milk
- b) Can be stored considerably for a longer period of time.
- c) More palatable
- d) Can be easily modified for infant feeding.
- e) The viscosity of the milk increases.
- f) Softer curd and cheese is formed.
- g) Stiffer custards can be prepared.

Dis-advantage

- a) It curdles the soup.
- b) In a sauce the fat can be separated.

3. Sterilized milk: This is homogenized milk in which the milk is heated to 104-110°C for 30-40 minute in sealed bottle, which kills the souring and disease bearing bacteria. It has a different taste from fresh milk and the shelf life of this type of milk is 2-3 months in sealed bottle.

4. Ultra- heat treatment milk: In this the milk is treated to ultra-heat treatment that is 132°C for 1 second under sterile conditions. This extends its shelf life by 2-3 months and allows the seal packed milk to be stored unrefrigerated, but it affects the taste adversely.

5. Microfiltration: Microfiltration is a process that partially replaces pasteurization and produces milk with fewer microorganisms and longer shelf life without a change in the taste of the milk. In this process, cream is separated from the whey and is pasteurized in the usual way, but the whey is forced through ceramic micro-filters that trap 99.9% of microorganisms in the milk (as compared to 95% killing of

microorganisms in conventional pasteurization). The whey then is recombined with the pasteurized cream to reconstitute the original milk composition.

6. Condensed milk: It is richer than evaporated milk because more water has been removed. It may be sweetened or unsweetened, but sugar acts as preservation which is added in form of sucrose or dextrose.

Eg. Milk maid

7. Dried milk: Can be produced either by:-

- a) **Roller Drying** – The evaporated milk is run on to hot rollers which cause the removal of remaining moisture by further evaporation the solid milk which sticks to the roller is scraped off the roller. The temperature and the rate of rotation of the steel heated drums are controlled so that the milk is dried in less than a complete rotation.
- b) **Spray Drying** – By this the milk is evaporated, to reduce the bulk, then it is forced through a fine spray into a hot chamber and here in the hot chamber the remaining water is removed. The temperature ranges from 380⁰ F to 400⁰F. It is desirable to cool down the dried powder as quickly as possible in a separate cool room, because the prolonged temperature will deteriorate and discolour the product.

8. Skimmed Milk: It is that from which a part whole of their fat has been removed in the form of cream. Skimming of milk is done by machine, called separator, which applies the centrifugal force to remove the milk fat and often 1% of fat remains in the milk after skimming.

Storage of milk: As milk gets curdled, it should not be kept standing for not more than approx. 1 hour.

- Keep milk in refrigerated conditions below 45⁰F.
- As milk absorbs odor from other items easily and gets contaminated, so extreme precautions are taken. Milk should be always be kept covered.
- Frozen milk should be thawed first and then boiled
- Always boil the milk, cool and then refrigerate. Boiling kills all the harmful micro-organisms.
- The storing container should be fresh without any swills or odor.
- Self live in refrigerator in frozen condition is approx 4-5 days.
- Tinned milk should be stored in cool, dry place.

3.11.4 Milk Products

The different types of milk products are :

1. Cheese
2. Butter
3. Cream
4. Yoghurt
5. Khoya
6. Butter milk

3.11.4.1 Cheese

A solid food obtained from the pressed curd from the wholly, partially or skimmed milk of cow or from the any milk producing animal, like buffalo, ewe, goat, sheep, camel etc., it is often seasoned and aged.

Origin: It is a generic term for a diverse group of fermented milk-based food products. Cheese is produced throughout the world in wide-ranging flavors, textures, and forms. The origins of cheese have not been documented. One does not know where or when it came into existence, but the farmers of Mesopotamia, who first domesticated goats and sheep certainly made their cheese from milk. There is a story-around 9000 years ago; an Arabian merchant was riding on a camel through the desert. He had brought with him a bag of skin that was filled with goat milk. When he opened the bag to drink the milk, he found that the milk had converted to cheese! Apparently, the heat and rocking motion of the camel had turned the milk into solid cheese and whey. Cheese is made by almost every country in the world. There are varieties of cheese with different textures, flavours and colours. Though cheese is primarily made of cow's milk but in certain parts of Europe and the Middle East, it is also made of goat's milk. Other sources for making cheese are the milk of yak (China), buffalo (Philippines, India and Italy) and even from donkey and horse's milk in Afghanistan and Iran.

Nutritive Value of Cheese: Cheese, like many other milk products, provides protein, vitamins, minerals, fat, saturated fat and cholesterol. While cheese is one of the best sources of calcium, it may also be high in sodium and saturated fat. A 1½ gms serving of natural cheese supplies the same amount of calcium as 1100 ml. of milk or yogurt, as well as 12 to 14 gm. total fat, 9 gm. saturated fatty acids, 44 ml. cholesterol and 173 calories. For sodium, while 100 ml of milk contains 120 ml, 1½ gm of natural cheese could contain from 110 to 450 ml, while 2 gm of process cheese could contain 800 ml.

Making of Cheese: Cheese is obtained by coagulating milk with rennet, lactic acid or other suitable enzyme or acid with or without further treatment of separated curd by heat or pressure or by means of ripening ferments, special moulds of seasonings. But the most commonly used technique is to use the action of rennet on milk. Curd formed at 1060 F is more firm where as at low temperature the curd is soft.

Milk is heated to a certain degree depending upon the type of curd required. The rennet is then added to this milk, which takes 8-10 hours to coagulate all the milk casein and removing the whey. When all the whey is removed, the curd mats together and forms mould which is left for ripening. Ripening helps to improve the flavour, texture and the colour of the cheese. The ripening period may vary from weeks to years depending upon the quality desired. Then the cheese is stored which are called curing, which again depends upon the period of the storage. The longer the curing period, the sharper, richer and flavourful cheese is developed. In the process of ripening cheese loses its toughness, rubbery qualities and becomes soft and mellow. During ripening process the bacterial action takes place, which produces CO₂, which produces holes and veins in cheese.

Classification of cheese: A cheese can be distinguished by its flavor, smell and texture. Fresh cheese is un-ripened curd eaten shortly after it is made, while soft cheese is briefly ripened and can be easily spread and is also very fattening. Semi-

Hard cheese is matured with less moisture and is pretty easy to cut and hard cheese is matured over a long period with less moisture content and may have up to 50% fat.

1. FRESH AND SOFT CHEESE

- **Cottage Cheese:** A lumpy and bland curd cheese, usually containing cream, has a moist texture. It is available in most countries and is used mainly for making cheesecakes and salads. In India, cottage cheese is very commonly used in most houses and goes by the name of 'paneer'.
- **Brie:** This is a soft French Cheese made from cow's milk. It has a creamy, sometimes runny texture, mild yet robust flavor. It is used to make snacks and salads.
- **Camembert:** This French cheese is made of cow's milk and has a very distinctive taste that changes from mild to pungent as it ages. This cheese is famous as a dessert and a snack cheese.
- **Mozzarella:** This Italian un-ripened curd cheese was originally made from buffalo milk but now is made from cow's milk as well. This is an extremely soft cheese with a chewy texture and has a mild and creamy taste. This cheese is used primarily to make pizzas, lasagna and grilled sandwiches.
- **Ricotta:** Another Italian un-ripened cheese made from the whey of cows milk. This cheese is very smooth and has a milky taste and is used for the preparation of sweets and savory dishes as well as for making pizzas.

2. SEMI HARD CHEESE

- **Cheshire:** An English specialty made of cow's milk with a crumbly texture and a salty ting. This cheese ripens at a fast rate. Cheshire cheese is available in two varieties- Red Cheshire and White Cheshire. It makes a very good snack cheese.
- **Emmental:** This world famous Swiss cheese is made of cow milk and has a slight sweet and nutty taste. It is usually used as a base for fondues and toasted snacks.
- **Dunlop:** This is a Scottish cheese, made of cow's milk with a bland and buttery taste. It is an ideal snack cheese and is good for toasting.
- **Gruyere:** This is a Swiss cheese but variations are produced in France and Switzerland. It has a smooth and uniform paste with a few pea-sized holes and a dark brown rind. It is a good table cheese and is used to make fondues, sauces and quiches.
- **Cheddar:** This cheese by far is England's most famous. Made from cow's milk, it varies from mild to very sharp. Cheddar cheese is used mostly for cooking and also made for making sauces, souffles, salads and pizzas.
- **Edam:** Semi soft to hard texture, with small holes, Edam has a mild and sometimes a nutty flavor.

3. HARD AND SMOKED CHEESE

- **Parmesan:** An Italian cheese with a grainy texture and a golden color, it is made of finely cut and carefully separated curd, which then is stirred and scalded before being pressed. It has a sharp and salty flavor. Parmesan cheeses are used for Italian cooking.
- **Sapsago:** A Swiss cheese made from sour and skimmed milk, is also known as green cheese because of its pale green color.

- **Smoked Emmental:** This cheese is traditionally made in a long sausage like shape and is used often as a snack cheese.
- **Mycella:** A Danish cheese that's made from cow's milk and has blue-green streaks. It's a relatively mild blue cheese, and is usually used as a table cheese but can also be used in salads and salad dressings.

4. **BLUE CHEESE**

They have *Penicillium* culture added so that the final product is spotted or veined throughout with blue, blue-gray or blue-green mold, and carries a distinct smell. Some blue cheeses are injected with spores before the curds form and others have spores mixed in with the curds after they form.

- **Roquefort:** is a sheep milk cheese with bluish green veins, tangy taste and crumbly texture. It has its origin in England.
- **Gorgonzola:** it is cow's milk cheese from Italy. It has sharp spicy flavour and creamy texture.
- **Stilton:** strong smelling English cheese from cow's milk. It is only made cylindrical shape and has its own rust or coat.
- **Blue Cheshire:** A cylindrical and blue version of the Cheshire and the finest of all blue cheeses, this is made from cow milk and ripens and turns blue 'accidentally'. With a very rich taste, it is best used as a dessert cheese.
- **Bavarian Blue:** A double creamed, soft and blue-veined cheese with a mildly sour taste, it is best used in sandwiches as a spread.

Uses of Cheese in Cookery

- Soup – as garnish (Minestrone)
- Crust formation – on Au gratin dishes (Vegetable Au gratin)
- As accompaniment – in most farinaceous dishes (Spaghetti Napolitane)
- Egg dishes – Omelettes, Egg Florentines etc.
- Salad – Greek salad (feta cheese)
- Appetizers – sandwiches, salads; in cooked foods; desserts
- Horsd'oeuvres – Sandwiches, Tikkas
- On pizza – sliced and then gratinated.
- Thickening agent – in sauces (Mornay)
- Main course dishes – Paneer Lababdar
- Sweet – Rasgolla

Purchase of cheese:

- From well known and reliable shopkeeper.
- Inspect for any type of spoilage, breakage, mould formation, smell.
- Inspect the package and labels.
- You should have enough knowledge about the characteristics and texture of the cheese. Examine the cheese, especially the aroma, appearance, and flavor. An ammonia, sour milk, barnyardy or unclean aroma is undesirable. The cheeses should be characteristic of their style, with an interior that is free of cracks, discoloration, and mold (unless it is a blue cheese).
- If possible taste the cheese before buying.

How to store cheese:

- Once you've brought the cheese home, leave it in its original packaging and tightly cover it in plastic wrap. This reduces air circulation, which in turn reduces the possibility of mold. Store the cheese in the coldest part of your refrigerator - not on the door.
- Cheese is more flavorful at room temperature. Let it stand for a half hour before serving.
- Cheese will continue to ripen, no matter how carefully it is stored. Hard cheeses will generally keep for several months, whereas softer cheeses will keep from one to three weeks after opening, if stored in an airtight container.
- Shredded cheese is more prone to mold because it has more exposed surface area. Try to use shredded cheese within a few days.
- Use moisture-proof and airtight wrapping.
- Freeze quickly and store at 0 °F for two to six months.
- Thaw in refrigerator so cheese won't lose moisture; the slower the cheese is thawed, the better.
- Use as soon as possible after thawing.

CHECK YOUR PROGRESS -IV

Q.1 Write down the process of making cheese.

Q.2. Discuss the nutritional value of milk.

Q.3 What are the advantages of homogenized milk?

3.11.5.2 Butter

Definition: Butter is a dairy product made by agitating or churning fresh or fermented cream or milk. In many parts of the world, butter is an everyday food. Butter is used as a spread, as a condiment and in cooking applications such as baking, sauce making, and frying. Butter consists of butterfat surrounded by droplets of water and milk proteins. The most common form of butter is made from cows' milk, but butter can also be made from the milk of other mammals, including sheep, goats, buffalo, camel and yaks. Salt, flavorings, or preservatives are sometimes added to butter. Rendering butter produces clarified butter or ghee, which is almost entirely butterfat. To be sold in stores, butter must contain at least 80 percent milk fat. Water and milk solids make up the other 20 percent. A firm solid when refrigerated, butter softens to a spreadable consistency at room temperature and melts to a thin liquid consistency at 32–35 °C (90–95 °F). The color of butter is generally a pale yellow, but can vary from deep yellow to nearly white. The color of the butter depends on the animal's feed and is sometimes manipulated with food colorings, most commonly *carotene* or *annatto*.

Butter production: Un-homogenized milk and cream contain butterfat in the form of microscopic globules. These globules are surrounded by membranes made of phospholipids (fatty acid emulsifiers) and proteins, which prevent the fat in milk from pooling together into a single mass. Butter is produced by agitating cream, which damages these membranes and allows the milk fats to come together and separate from the other parts of the cream. Almost all commercially-made butter today starts with pasteurized cream, usually heated to a relatively high pasteurization temperature above 80 °C (180 °F). Before it is churned, the cream is cooled to about 5 °C (40 °F) and allowed to remain at that temperature for at least eight hours; under these conditions about half the butterfat in the cream crystallizes. Churning produces small butter grains floating in the water-based portion of the cream called butter milk. The buttermilk is drained off; sometimes more buttermilk is removed by rinsing the grains with water. Then the grains are "worked": pressed and kneaded together. This consolidates the butter into a solid mass. Commercial butter is about 80% butterfat and 15% water; traditionally-made butter may have as little as 65% fat and 30% water.

TYPES OF BUTTER

- **Cultured butter-** Butter made from a fermented cream resulting in more "buttery" tasting product.
- **Sweet cream butter-** Butter made from pasteurized fresh cream. It is sweeter in taste.
- **Raw cream butter-** Butter made from fresh or cultured unpasteurized cream. It has cream like flavour.
- **Spreadable butters-** these remain softer at colder temperatures and are therefore easier to use directly out of refrigeration. They are fortified with vegetable oil to remain soft..
- **Whipped butter-** spreadable butter aerated with nitrogen gas to make it more spreadable.
- **Salted butter-** powdered salt is added to raw butter to give it a distinct salty taste.
- **Clarified butter-** is butter with almost all of its water and milk solids removed, leaving almost-pure butterfat. Clarified butter is made by heating

butter to its melting point and then allowing it to cool off; after settling, the remaining components separate by density.

- **Ghee**- is clarified butter which is brought to higher temperatures (120 °C/250 °F) once the water has cooked off, allowing the milk solids to brown.
- **Composed butter or composite butter**-when herbs and spices are added to the butter. It is also called as herbed/flavoured/Maître de hotel (MDH) butter. Composed butters can be used as spreads, or cooled, sliced, and placed onto hot food to melt into a sauce. Sweetened composed butters can be served with desserts; such hard sauces are often flavored with spirits.
- **Beurre blanc** -(white butter) is made by whisking butter into reduced vinegar or wine, forming an emulsion with the texture of thick cream.
- **Beurre monté** -(prepared butter) is an unflavored *beurre blanc* made from water instead of vinegar or wine; it lends its name to the practice of "mounting" a sauce with butter: whisking cold butter into any water-based sauce at the end of cooking, giving the sauce a thicker body and a glossy shine—as well as a buttery taste.
- **Beurre noir**- (black butter) are sauces of melted butter cooked until the milk solids and sugars have turned golden or dark brown
- **Beurre noisette**- or "hazelnut butter", sometimes loosely translated as brown butter is prepared by browning butter.

Uses of butter

- Normal butter softens to a spreadable consistency around 15 °C (60 °F), and can be used as spread on bread,buns, rotis and chapatis.
- Butter is used for sautéing and frying, although its milk solids brown and burn above 150 °C (250 °F)—a rather low temperature for most applications. The actual smoke point of butterfat is around 200 °C (400 °F), so clarified butter or ghee is better suited to frying. Ghee has always been a common frying medium in India, where many avoid other animal fats for cultural or religious reasons.
- Preparation of Hollandaise sauce.
- Used in preparation of sauces, mostly in French cuisine.
- Used as shortening agents in bakery.
- Used for making butter icings for decorating cakes and pastries.
- Used in tempering dals and curries in Indian foods

Storage

- Butter should always be stored tightly wrapped. This reduces rancidity (spoilage)
- Butter should always be stored in refrigerators.
- Butter absorbs odors from other foods rapidly. To prevent flavor changes, keep butter wrapped in moisture- and vapor-proof material or in tightly covered containers.
- Opened portions of butter should be refrigerated in a covered dish.
- Always serve butter in butter dish with water.
- Wrap butter in hygienic plastic film, quality butter papers tightly.

3.11.5.3 Cream

Definition: Cream is a dairy product that is composed of the higher-butterfat layer skimmed from the top of milk before homogenization. Cream produced by cows

(particularly Jersey cattle) grazing on natural pasture often contains some natural *carotenoid* pigments derived from the plants they eat; this gives the cream a slight yellow tone, hence the name of the yellowish-white color, cream. Cream from goat's milk, or from cows fed indoors on grain or grain-based pellets, is white.

Production

In the industrial production of cream this process is accelerated by using centrifuges called "separators".

Types of cream

- Low cream- 5-6% fat
- Half and half- 10.5-18% fat
- Light- 12-12.5% fat
- Single cream- 18%
- Pure – 35-56% fat
- Whipping- 35% fat
- Double – 38-48% fat
- Sour cream- cream subjected to bacterial culture, so is sour in taste
- Smentana- heavy cream form Europe
- Crème fraiche- slightly sour cream from France
- Rjome- Norwegian cream with 35% fat
- Clotted cream- Cream slowly heated to dry and thicken- similar to malai.

Uses of cream

- As thickening agent for soups, sauces and gravies
- Increases the palatability of the food.
- Used as softening agent for pies and custards.
- Preparation of ice cream.
- Preparation of salads
- Preparation of icings for cakes and gateaux.
- As garnishing agents for soups, dals, and other curry dishes.

3.11.5.4 Yoghurt

Definition- it is a dairy product produced by bacterial fermentation of milk. It has a characteristic tanginess than curd. It is a Turkish product. Dairy yoghurt is produced using a culture of *Lactobacillus* bacteria.

Production: Milk is heated to about 80 °C to kill any undesirable bacteria and to denature the milk proteins so that they set together rather than form curds. It is then cooled to about 45 °C. The bacteria culture is added, and this temperature is maintained for 4 to 7 hours for fermentation.

Uses of yoghurt

- Anti-diarrheal property
- It has also an antibiotic property.
- Preparation of soups like Tarator and Cacik.
- Preparation of salads (Khyar w laban)
- Preparation of raitas.

3.11.5.5 Khoya

Khoya (also khoya) is a milk food widely used in the North Indian cuisine, made of either dried whole milk or milk thickened by heating in an open iron pan. It is similar to ricotta cheese, but lower in moisture and made from whole milk instead of whey.

Types of Khoya

1. **Batti-** meaning “rock’ has 50% moisture by weight. It is very hard and is grated to use.
2. **Chikna-** has 80% moisture, can be mashed by hand.
3. **Danedar-** is coagulated milk and has moderate moisture content.

Preparation of Khoya: Khoya is prepared by continuous simmering milk till its moisture dried up. One liter of concentrated milk gives 200 grams of khoya approximately.

Uses of Khoya: Following are the uses of Khoya:

- Preparation of Indian sweets like Gulab jamun, Pedha, Burfi, Halwa etc.
- Uses as thickening agent for preparation of Makhani gravy and rabri.
- Used as stuffing as in Gujia, koftas etc
- Preparation of khoya based curries.

Storage of khoya

- Khoya is always stored same like butter.

3.11.5.6 Curd

Definition: Curd may be defined as the byproduct formed due to the action of acids or yeast on milk.

Preparation of curd: Curds are a dairy product obtained by curdling (coagulating) milk with rennet or an edible acidic substance such as lemon juice or vinegar, and then draining off the liquid portion (called whey). Milk that has been left to sour (raw milk alone or pasteurized milk with added lactic acid bacteria or yeast) will also naturally produce curds. In England, curds produced from the use of rennet is referred to as *Junket*. In Asia, curds are essentially a vegetarian preparation using yeast to ferment the milk. In some places in Indian subcontinent, particularly in North India, buffalo milk is used for curd due to its higher fat content, making a thicker curd. The time taken to curdle also varies with the seasons, taking less than 6 hours in hot weather and up to 16 hours in cold weather. In the industry, an optimal temperature of 43 °C for 4–6 hours is used for preparation.

Uses of curd: Used to prepare cheesecakes Ostkaka in Sweden

- To thicken Indian gravies and curries
- To prepare dips like Raitas.
- Act as souring agent in curries.
- Preparation of cheese.
- Preparation of sweets like Shrikhand.

3.11.5.7 Butter Milk

Definition- It is referred as the liquid left behind after churning butter out of cream. The tartness of buttermilk is due to the presence of acid in the milk. The increased

acidity is primarily due to lactic acid, a byproduct naturally produced by lactic acid bacteria while fermenting lactose, the primary sugar found in milk.

Types of buttermilk

- a) **Traditional type-** In the Indian subcontinent, buttermilk is taken to be the liquid leftover after extracting butter from churned yogurt (dahi) . Traditional buttermilk is still common in many Indo-Pak households but rarely found in western countries. In Southern India and most areas Punjab buttermilk with added water, sugar and/or salt, asafoetida, and curry leaves are given at stalls in festival times.
- b) **Cultured buttermilk-**Buttermilk may also refer to a fermented dairy product produced from cow's milk with a characteristically sour taste caused by lactic acid bacteria. This variant is made in one of two ways: artificial, cultured, buttermilk is made by adding lactic acid bacteria (*Streptococcus lactis*) to milk; Bulgarian buttermilk is created with a different strain of bacteria called *Lactobacillus bulgaricus*, which creates more tartness.
- c) **Acidified buttermilk-** is a related product that is made by adding a food-grade acid (such as lemon juice) to milk.

Uses of Butter milk

- As beverage- Chhas is prepared by tempering buttermilk with spices and drunk in Northern India.
- As in making gravies- Kadhi gravy
- As a souring agent in Bhaturas
- As taste enhancer in curries.
- Used in bakery in place of milk.
- Used as marinade in most of the Indian meat dishes.

CHECK YOUR PROGRESS -V

Q.1 How is blue veined cheese formed?

Q.2. What are the different types of butter milk?

Q.3 How will you store cheese??

3.11.5 Milk Production in India

Dairy industry is of crucial importance to India. The country is the world's largest milk producer, accounting for more than 13% of world's total milk production. It is the world's largest consumer of dairy products, consuming almost 100% of its own milk production. The milk processing industry is small compared to the huge amount of milk produced every year. Only 10% of all the milk is delivered to some 400 dairy plants. In spite of having largest milk production, India is a very minor player in the world market. But with the onset of Operation Flood Programme, the scenario dramatically changed and commercial imports of dairy products came to a halt except occasional imports of very small quantities under The Agricultural and Processed Food Products Export Development Authority (APEDA) The major destinations for Indian dairy products are Bangladesh (23.1%), UAE (15.4%), US (15.6%) and Philippines (8.9%).

Operation flood: Operation Flood was a rural development programme started by India's National Dairy Development Board (NDDB) in 1970. One of the largest of its kind, the programme objective was to create a nationwide milk grid. It resulted in making India the largest producer of milk and milk products, and hence is also called the White Revolution of India. It also helped reduce malpractices by milk traders and merchants. This revolution followed the Indian green revolution and helped in alleviating poverty and famine levels from their dangerous proportions in India during the era. Gujarat-based co-operation "*Anand Milk Union Limited*", often called Amul, was the engine behind the success under the leadership of Tribhuvandas Patel, Chairman of Amul and Verghese Kurien was the chairman of NDDB. The programme in turn became a mega company based on the cooperative approach.

Operation Flood has helped farmers, direct their own development, placing control of the resources they create in their own hands. A 'National Milk Grid', links milk producers throughout India with consumers in over 700 towns and cities, reducing seasonal and regional price variations while ensuring that the producer gets a major share of the price consumers pay.

The bedrock of Operation Flood has been village milk producers' cooperatives, which procure milk and provide inputs and services, making modern management and technology available to members. Operation Flood's objectives included:

- Increase milk production ("a flood of milk") Augment rural incomes

- Fair prices for consumers
- Augment rural incomes

The effect of White revolution was that: India's milk production rose from around 30 million tonnes in 1980 to an estimated 87 million tonnes by 2003 and despite increasing population, availability per person rose from less than 50 kilo calories per day in 1980 to 80 kilo calories per day in 2000, a report on hunger by the Food and Agriculture Organization (FAO) said. The report forecasts that India's dairy production will triple by 2020.

3.12 Summary

Cereals and pulses are the vital food components for human beings. They provide maximum energy to humans. Varieties of cereals and pulses are used in culinary. Similarly fats and oils and sugar and fruits and vegetables also form a major part of our diet. They all are considered to be the backbone of cookery. In-fact they all are considered as the primary food for humans. Their various types and varieties add different flavours to our diet and numerous dishes are found in the world.

Milk is a vital component used as food today all over the world. Its consumption occurs in everyday life in different forms be it liquid, cheese, curd or butter form or as many other. This has led in the growth of dairy farms extensively across the world. Rich in all the vital nutrients, it has become the universal food of all class. For easy procurement of milk especial variety of animals are being reared and they are fed likewise. It has been observed that more than 80% of the people all over the world take milk in any form.

3.13 Glossary

Pasteurization- Pasteurization is used to kill harmful microorganisms by heating the milk for a short time and then cooling it for storage and transportation.

Yoghurt- it is a dairy product produced by bacterial fermentation of milk and has a characteristic tanginess than curd.

Junket- curds produced from the use of rennet is referred to as *Junket*.

Flash process- In this milk is heated to 71.1°C (161° F) and then subsequently held for 15 seconds and then it is rapidly cooled below 48°C (50° F).

Hold process: In this the milk is heated to 63-65° C (145-150° F) and then maintain this temperature for 30 minutes and then cooled down immediately to 48° C (50° F)

Batti- meaning “rock’ has 50% moisture by weight. It is very hard and is grated to use.

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3.15 Terminal Questions

Short answer type questions

1. Classify cereals with examples.
2. How will you purchase and store cereals?
3. Classify rice according to their availability
4. What do you mean by par-boiled rice? Why is it important?
5. What are the methods of cooking of rice?
6. What is the role of sugar in cookery?
7. How will you prevent lump formation while cooking starch ?
8. Classify fat and write the uses of fat in cookery

Long answer type questions

1. Discuss the milling process and uses of wheat
2. Discuss the varieties and products of maize.
3. What are points you will consider while selecting cereals?
4. Discuss the importance of Jowar, Ragi and Bajra in our diet.
5. Discuss in details the variety of pulses used in cookery
6. Classify fruits with examples

7. What are the points you should consider while purchasing fruits and vegetables?
8. Discuss in detail the different kinds of sugar
9. Discuss the different types of salt and their uses in cookery.
10. Classify cheese giving three examples of each.
11. How khoya is prepared? What are the different types?
12. Write a brief note on Operation flood.
13. What are the different types of cream?
14. Explain the process of storing milk.
15. What are the uses of cream? Discuss.
16. How butter is processes from milk? Describe in detail
17. What are the uses of cheese in cookery.
18. Discuss the different types of butter
19. Describe in detail the process of production of curd.

Write short notes on:

1. Blue cheese
2. Curdling of milk
3. Ghee
4. Purchasing of cheese
5. Amul
6. Maitre de hotel
7. Uses of cream
8. Beurre monte
9. Purchasing cheese
10. Types of khoya

UNIT: 4

STOCKS, SAUCES, SOUPS AND SALADS

Structure

- 4.1 Introduction
- 4.2 Objectives
- 4.3 Stock
- 4.4 Sauces
- 4.5 Soup
- 4.6 Salads
 - 4.6.1 Ingredients of Salad
 - 4.6.2 Salad Dressings
 - 4.6.3 The Structure of a Salad
 - 4.6.4 Types of Salads
- 4.7 Garnish
- 4.8 Summary
- 4.9 Key Terms
- 4.10 References/Bibliography
- 4.11 Review Questions

4.1 Introduction

The French word for stock is **fond**, meaning "foundation" or "base." In classical cuisine, the ability to prepare good stocks is the most basic of all skills because so much of the work of the entire kitchen depends on them. A good stock is the foundation of soups, sauces, and most braised foods and stews. Nevertheless, the finest cuisine still depends on soups and sauces based on high-quality stocks, so stock-making remains an essential skill you should learn early in your training. Stocks and sauces are almost never served by themselves but are components of many other preparations. You will need to refer to this chapter in connection with many other subjects. Like stocks, sauces have lost some of the importance they once had in commercial kitchens except, of course, in the best restaurants serving what may be considered luxury cuisine. Some of this decline is due to changes in eating habits and to increased labor costs. No matter where you work, sauce-making techniques are basic skills you will need in all your cooking. Croquettes, soufflés, and mousses have sauces as their base, nearly all braised foods are served with sauces made of their cooking liquids, and basic pan gravies, favourites everywhere, are made with the same techniques as the classic sauces.

The popularity of soups today may be due to increased nutrition consciousness, to a desire for simpler or lighter meals, or to an increased appreciation of how appetizing and satisfying soups can be. Whatever the reasons, they emphasize the importance of soup making skills. A few more techniques are necessary for you to master before you are able to prepare all the types of soups that are popular today. As in sauce-making, basic techniques are the building blocks you can use to create a wide variety of appetizing soups.

There is no doubt that in the past ten years or so the availability and service of all kinds of salads in every type of catering establishment has gained a now long overdue importance. Modern catering, with an emphasis on healthier eating and the desire for lighter, more balanced meals, has made the service of salads at all meal times very popular. Particularly in the early part of the year, when most fresh vegetables are not yet available or very expensive, many types of salads could and should take the place of vegetables as an accompaniment to all types of hot and cold dish. It would be ridiculous to serve frozen vegetables at that time of the year when fresh salads could take their place, often at a fraction of the cost. The variety of salads available almost all the year round is considerable. If we then vary their dressings and presentations we can satisfy the taste of most of our guests without much repetition.

4.2 Objectives

After reading this unit learner will be able to:

- Understand meaning ,definition, types and method of preparation of stock
- Understand meaning ,definition, types and method of preparation of sauce
- Understand meaning ,definition, types and method of preparation of soup
- Understand meaning and definition types and method of preparation of salad

4.3 Stock

The preparation of stocks has been simplified in many ways since the days of Escoffier, although this does not mean it demands less care or skill. Few chefs today bother to tie vegetables for a stock into a bundle, for example. They're going to be strained out anyway. The number and variety of ingredients is usually not as great as it once was. Nor is it common to cook stocks for as many hours as was once thought necessary. All these details are taken up one by one in this section.

Stock is a liquid containing some of the soluble nutrients and flavours of the food which are extracted by prolonged and gentle simmering (Exception is Fish Stock which only requires 20 Min.). A stock may be defined as, “a clear, thin-that is, unthickened-liquid flavoured by soluble substances extracted from meat, poultry, and fish, and their bones, and from vegetables and seasonings”.

4.3.1 Types of Stock

On the basis of colour and ingredients used for stock making stock can be classified in to following categories:

WHITE STOCK

White Beef Stock
White Mutton Stock
White Veal Stock
White Chicken Stock

BROWN STOCK

Brown Beef Stock
Brown Mutton Stock
Brown Veal Stock
Brown Game Stock

Fish Stock
Veg. Stock

4.3.2 Care, Safety and Hygiene while Preparing Stock

- Unsound meat, bones and decaying vegetable will give an unpleasant flavor to stock and stock will deteriorate quickly
- Scum should be removed otherwise it will spoil the colour and flavour of stock
- Fat should be skimmed, otherwise stock will taste greasy
- Stock should always simmer, otherwise water will evaporate and stock will become cloudy
- Salt should never be added to stock
- If we wish to store stock, it should be cooled rapidly and stored in refrigerator below 5°C
- If they are to be deep-frozen then it should be labelled and dated and stored at -18°C
- Stock should not be reheated more than once
- Never store stock above eye-level

4.3.3 General Preparation of Stock

Ingredients	Quantity
Raw meaty bones	2 Kg.
Water	4.5 Liter
Vegetable	400 Gms.
Bouquet-Garni	One bunch
Peppercorn	12 Nos

METHOD

1. Chop and clean the bones
2. Place in stock pot
3. Add water
4. Cover and bring to boil and reduce the heat
5. Scum should be skimmed
6. Add vegetables and bouquet-garni
7. Simmer for 6-8 Hrs.
8. Skim and strain.

During cooking certain amount of water is evaporated. Add .5Ltr water (cold) this will help to throw scum at surface

4.3.4 Glaze

Glazes are made by steady boiling white or brown stock and allowing them to reduce to a sticky or gelatinous consistency.

1. They are stored in jars and when cold kept in refrigerator.
2. The peeping quality of glazes are higher the stock, it can be kept for months.
3. Glazes are used to improve the flavor of prepared food.
4. They may be used as base for sauces.

CHECK YOUR PROGRESS -I

Q.1 Define Stock? Write note on types of Stock.

Q.2. Write a note on ‘care while preparing stock’.

Q.3 What is glaze?

4.4 Sauces

Sauce works like a seasoning. It enhances and accents the flavour of the food; it should not dominate or hide the food. A good cook knows that sauces are as valuable as salt and pepper. A simple grilled steak is made even better when it has an added touch, something as simple as a slice of seasoned butter melting on it or as refined as a spoonful of béarnaise sauce. No matter where you work, sauce-making techniques are basic skills you will need in all your cooking. Croquettes, soufflés, and mousses have sauces as their base, nearly all braised foods are served with sauces made of their cooking liquids, and basic pan gravies, favourites everywhere, are made with the same techniques as the classic sauces. Sauce is defined as under:

“Sauce is a liquid, having smooth and glossy appearance, definite in taste and light in texture; thickening is done in moderation”.

4.4.2 CLASSIFICATION OF SAUCES

Sauces are classified as shown in the chart below:

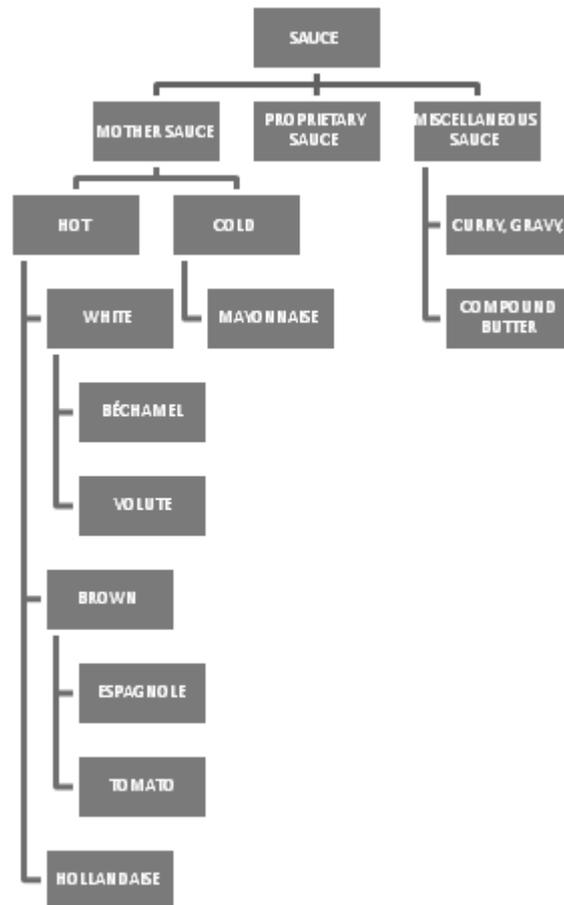


Figure4.1 Classification of sauces

4.4.3 Uses of Sauces

1. To enhance the flavour of the food
2. To give colour to food
3. Help in digestion
4. Moisten dry food
5. Enhance nutritional value of food
6. Lend a name to dish e.g. fish Portuguese
7. Give a balanced taste

4.4.4 Thickening Agents for Sauces

Thickening agents used for SAUCES are as under:

1. Roux
2. Beurre-manie
3. Starch

- 4. Egg yolk
- 5. Puree
- 6. Blood
- 7. Glazes

ROUX: A roux is a combination of Fat and Flour which are cooked together. Roux is of type:

- 1. White roux
- 2. Blond roux
- 3. Brown roux

BEURRE- MAINE: Equal quantity of Butter or Margarine and Flour kneaded to a smooth paste and added to boiling liquid.

STARCH: Starch such as corn flour, arrowroot, potato starch etc. are used to thicken sauce or gravy.

EGG YOLK: Egg yolk is used in emulsified sauces such as mayonnaise, hollandaise and custard sauces.

PUREE: Vegetable or fruit puree is known as CULLIS used in thickening.

BLOOD: Blood is used in recipes such as jugged hare

GLAZES: Stock reduced base sauces are prepared using demi-glaze

CHECK YOUR PROGRESS -II

Q.1 Define Sauce?

Q.2. Write a note on ‘Thickening Agents for Sauces’.

Q.3 Classify sauce and enlist the uses of the same?

4.4.5 Basic Mother Sauces

Basic mother sauces are:

1. BÉCHAMEL
2. VELOUTÉ
3. ESPAGNOLE
4. TOMATO
5. HOLLANDAISE
6. MAYONNAISE

BÉCHAMEL SAUCE

A white sauce prepared by adding milk to roux. This sauce is widely used for egg, vegetables and gratin dishes. It can be kept warm in bain-marie and used to prepare other derivatives

Ingredients	Quantity
Margarine / oil / Butter	100Gms.
Flour	100Gms
Milk	1000 ML.
Studded onion	1 Nos

METHOD

1. Melt fat in thick bottom pan.
2. Add flour and mix well.
3. Cook for few minutes over a gentle heat with out coloring.
4. Remove from heat and cool the roux.
5. Gradually add the warm milk and stir till smooth.
6. Add onion studded with clove and allow simmering for 30 Min. remove from heat and take out onion and strain.
7. Cover with thin film of butter to prevent skin formation.

DERIVATIVES OF BÉCHAMEL

Sauce	Name of Ingredients	Served With
Mornay	Béchamel + Parmesan + Egg yolk	Fish, Eggs & Vegetables
Cream	Béchamel + Fresh cream + Butter	Poached Fish, Boiled Vegetable
Soubise	Béchamel, Sautéed Onion, Pepper + Nutmeg and strained	Eggs, Fish, Roast Meat

Scotch egg	Béchamel + 2 Hard Boiled egg, diced	Poached/Boiled Fish
Parsley	Béchamel + Fresh Cream + Chopped Parsley	Poached/Boiled Fish, Veg
Anchovy	Béchamel + Anchovy Essence	Poach/Boil/Fry Fish
Onion	Béchamel + minced Onion cooked in milk	Roast Mutton
Mustard	Béchamel + French/English Mustard	Grilled Herrings

SAUCE VELOUTÉ

A sauce prepared from white stock and blond roux. It can be kept warm in bain-marie and used to prepare other derivatives.

Ingredients Quantity

Margarine / oil / Butter	100Gms.
Flour	100Gms
Stock	1000 ML.

METHOD

1. Melt fat in thick bottom pan.
2. Add flour and mix well.
3. Cook to a sandy texture over a gentle heat with out coloring.
4. Remove from heat and cool the roux.
5. Gradually add the boiling stock and stir till smooth.
6. Allow to simmer for approximately 1Hrs.
7. Remove from heat and strain

DERIVATIVES OF VELOUTÉ

CHICKEN VELOUTÉ

SAUCE	NAME OF INGREDIENTS	SERVED WITH
Supreme	Chicken Velouté + White wine + Parsley + Shallots + Mushroom trimmings & strain add Fresh Cream + Egg yolk +Lemon juice	Fish Chicken
Allemande	Chicken Velouté + Egg yolk + Mushroom trimmings + Cream + Lemon juice	Poached Chicken
Ivory	Chicken Velouté + White wine + Parsley + Shallots + Mushroom trimmings & strain add Fresh Cream + Egg yolk +Lemon juice + Meat Glaze	Poached/Boiled Chicken
Mushroom	Chicken Velouté + White wine + Parsley + Shallots + Mushroom trimmings & strain add Fresh Cream + Egg yolk +Lemon juice + sliced Button Mushroom	Chicken & Mutton
Chaufroid	Chicken Velouté + Chicken glaze Cream	+ Cold dishes

Chivry	Chicken Velouté + Tarragon + Parsley + Chives then strain + Green Butter	Boiled/Poached Poultry
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MEAT/FISH VELOUTE

SAUCE	NAME OF INGREDIENTS	SERVED WITH
Shrimp	Fish velouté + fish fumet + cream + shelled shrimp tails + shrimp butter	Fish Shrimp
Normande	Fish velouté + mushrooms + oyster liquor + fish fumet finished with egg yolk cream + shelled shrimp tails + shrimp butter	Fish & Shell Fish
Diplomat	Fish velouté + mushrooms + oyster liquor + fish fumet finished with egg yolk cream + shelled shrimp tails + shrimp butter sauce + Lobster butter garnished with dices of lobster and truffles	Fish Shellfish
Caper	Mutton velouté + caper	Boiled leg of Mutton
Bercy	Allemande Sauce + chopped shallots + white wine + meat glaze + butter garnished with dices of marrow & chopped parsley	Grilled meat
Nantua	Fish velouté + fried mirepoix fish in crayfish butter	Fish Shellfish

ESPAGNOLE SAUCE

A sauces made by adding brown stock to brown roux and mirepoix and tomato puree.

Ingredients	Quantity
Margarine / oil / Butter	50 Gms.
Flour	60 Gms.
Brown Stock	1000 ML.
Tomatos puree	25 Gms.
Carrot	100 Gms.
Onion	100 Gms.
Celery	50 Gms.

METHOD

1. Melt fat in thick bottom pan.
2. Add flour and mix well to a light brown colour, stirring frequently.
3. Cool and mix the tomato puree. Gradually add the boiling stock and bring to boil.
4. Wash, peel and roughly cut the vegetables and brown lightly, drain extra fat and add to sauce.

5. Simmer for 4-6 Hrs. and Skim when necessary.

DERIVATIVES OF ESPAGNOLE

Sauce	Name of Ingredients	Served With
Bercy	Demi glaze + meat glaze + Minced shallots + white wine + sliced bone marrow	Grilled Meat Fish
Chasseur	Demi glaze + minced mushroom + sautéed chopped shallots & Parsley + reduced white wine	Grilled/Sautéed Meat, Poultry and Egg
Robert	Demi glaze + chopped onion + vinegar + sugar + mustard	Grilled Meat
Charcutiere	Demi glaze + chopped onion + vinegar + sugar + mustard+ juliennes of Gherkin	Grilled Pork chops
Madeira	Demi glaze + Madeira wine	Small items of Meat, Fish and Poultry

CHECK YOUR PROGRESS -III

Q.1 Write note on Mother Sauces.

Q.2. Write a note on ‘Béchamel Sauce and its derivatives’.

Q.3 Write a note on ‘Veloute Sauce and its derivatives’?

Q.4 Write a note on ‘Espagnole Sauce and its derivatives’?

TOMATO SAUCE

A sauce made by cooking tomatoes with bacon, carrots, chopped onion and garlic in stock and passed through sieve.

Ingredients	Quantity
Margarine / oil / Butter	10 Gms.
Flour	10 Gms.
Stock	375 ML.
Tomatos puree	50 Gms.
Carrot	50 Gms.
Onion	50Gms.
Celery	25 Gms
Bacon strips	10 Gms.
Bay leaf, Thyme, clove, garlic, salt & Pepper	

METHOD

1. Met fat in thick bottom pan.
2. Add the herbs and mirepoix and Bacon scrap brown lightly.
3. Mix the flour and cook to sandy texture and colour slightly.
4. Mix tomato puree and allow cooling.
5. Gradually add boiling stock.
6. Stir and add garlic, seasoning and simmer for 1 Hrs.
7. Correct the seasoning and cool. Pass through strainer.

DERIVATIVES OF TOMATO

Sauce	Name of Ingredients	Served With
Brettonne	Tomato sauce + sautéed chopped onions + White wine reduce & strained add Butter and chopped Parsley	Haricots
Portugaise	Tomato sauce + White wine + garlic + concussed tomato	Egg, Fish, Shell Fish
Italienne	Tomato sauce + demi-glaze + chopped shallots, Mushroom, Lean Ham & fine herbs	Brains, Lamb, Cutlets
Barbecue	Tomato sauce + ketchup + vinegar + Sugar	Barbecued Meat, Fish and Poultry
Tomato-Chaufroid	Tomato sauce + aspic jelly	Cold chicken and Eggs
Provencale	Thin Tomato sauce + sauteed sliced mushroom + chopped Parsley, Garlic, Tomato Concasse + Sugar	With cold Meat, Fish and Poultry

HOLLANDAISE SAUCE

A hot emulsified sauce made from egg yolk and clarified butter.

Ingredients	Quantity
Butter	200 Gms.
Egg yolk	200 Gms.
Crushed Pepper Corn	2 Nos.
Vinegar	15 ML.
Lemon juice	½

METHOD

1. Melt butter in a pan.
2. Place crushed peeper corn and Vinegar and reduce.
3. Add little water to cool.
4. Add egg yolk and whisk.
5. Place the pan in a double boiler and whisk the egg yolk till it gets cooked.
6. Gradually add the melted butter until it blends and forma a thick sauce.
7. Add lemon juice.
8. Strain and correct the seasonings.

DERIVATIVES OF HOLLANDAISE

Sauce	Name of Ingredients	Served With
Maltaise	Hollandaise + Zest + Orange juice	Hot Asparagus
Mousseline	Hollandaise + stiffly whipped Cream	Fish, Egg, Vegetable & Meat

Noisette	Hollandaise + nut brown cooked butter	Poached Salmon, Trout
Béarnaise	Hollandaise + chopped Tarragon & Chervil	Grilled Meat and Fish
Choron	Hollandaise + chopped Tarragon & Chervil + Tomato puree	Grilled & Sautéed Meat
Foyot	Hollandaise + chopped Tarragon & Chervil + meat glaze	Grilled & Sautéed Meat
Mustard	Hollandaise + mustard	Meat and Steak

SAUCE MAYONNAISE

A cold emulsified sauce consisting of egg yolks and oil blended together and flavoured with vinegar, salt, pepper and mustard.

Ingredients	Quantity
Salad oil	1000 ML.
Egg yolk	8 Eggs
Mustard	¼ table spoon
Vinegar	25 ML.
Lemon	1 Nos.
Seasonings to taste	

METHOD

1. Place the egg yolk, vinegar & seasonings in a clean bowl.
2. Whisk well.
3. Slowly add oil and whisk continuously until all oil is incorporated.
4. Finish it by adding juice of lemon and warm water.

DERIVATIVES OF MAYONNAISE

Sauce	Name of Ingredients	Served With
Cambridge	Pounded hard-boiled eggs + anchovy fillets + capers + chervil + tarragon + chives + vinegar + Cayenne pepper, add oil gradually as for mayonnaise, strain + chopped parsley	Cold meat
Tartare	Mayonnaise + hard yolk of eggs, garnished with finely chopped onion and chives	Fried fish / shellfish
Green Sauce	Mayonnaise sauce mixed with puree of blanched herbs, spinach, water parsley, chervil, tarragon. Pass through very fine sieve	Cold fish & shellfish
Vincent	Equal quantity of Tartare & Green Sauce	Cold fish & Shellfish

Thousand Island-Dressing	Mayonnaise + hard boiled eggs + tomato ketchup + chopped gherkins + onions +pimentos, olives + paprika+ onions +pimentos, olives + paprika Powder	Cold Meat
Cocktail	Mayonnaise + tomato ketchup + Worcester sauce + Tabasco + cream + lemon juice	Shellfish

CHECK YOUR PROGRESS -IV

Q.1 Write a note on ‘Tomato Sauce and its derivatives’.

Q.2. Write a note on ‘Hollandaise Sauce and its derivatives’.

Q.3 Write a note on ‘Mayonnaise Sauce and its derivatives’.

4.5 Soup

Soup, according to the dictionary, is a liquid food derived from meat, poultry, fish, or vegetables. This definition is all right as far as it goes, but there's a lot it doesn't tell us. Is a stock, straight from the stockpot, a soup? Is beef stew liquid enough to be called a soup? We're interested more in production techniques than in definitions. However, a few more definitions are necessary before we can go into the kitchen, so we can talk to each other in the same language. Definitions aren't rules, so don't be alarmed if you hear other books or chefs use these terms differently. What matters is that you learn the techniques and are able to adapt them to many uses. **"Soup is a liquid food prepared by extracting nutrients from solid food like Meat, Beef, Poultry, and Game etc in a liquid medium"**.

- Soups are regarded as appetizers.
- Soups are served as first course of meal.

4.5.1 Classification

Soups are classified as under:

1. Thin
2. Thick
3. Cold
4. National & International

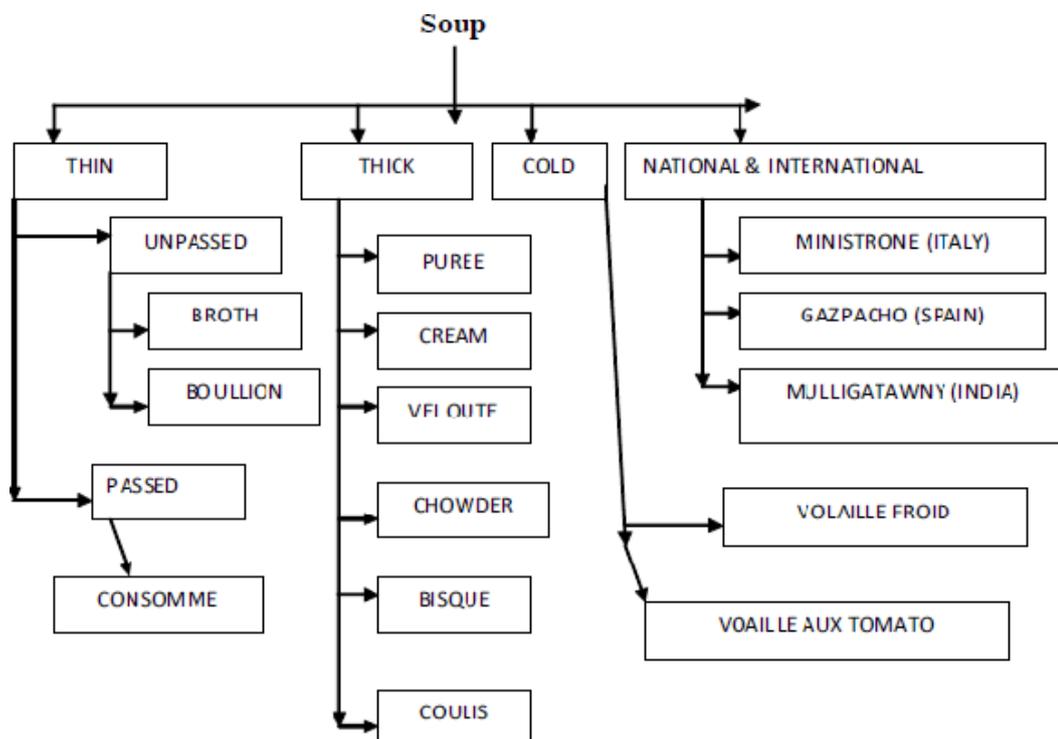


Figure 4.2 Classification of Soup

1. THIN SOUP: Thin soups are clear, flavoured, nutritious liquid prepared without any thickening agent, garnished with small cuts of food items floating in it. Thin soups are further classified, whether they are passed through strainer or not. Depending on these criteria they are of following two types:

- Passed
- Un passed

PASSED: They are passed through the strainer. E.g. Consommé

Consomme: Consommé is a clear soup prepared from Meat, Beef, Poultry or Game stock, garnished with variety of ingredients; Name of consommé depends upon the garnish. E.g. consommé julienne

- Consommé should be sparkling, clean and well flavoured.
- Consommé may be served hot or cold.

Ingredients	Quantity
Minced Meat	225 Grams
Onion	70 Grams
Carrot	50 Grams
Turnip	30 Grams
Stock	1500
Egg white	2 Nos.
Celery	40 Grams
Thyme	¼ TSP
Bay leaf	½ Nos.
Pepper corn	3 Nos.

Method:

1. Mix minced meat with chopped Onion, Carrot, Turnip, Celery and mix well with egg white.
2. Add cold stock and Thyme, Bay leaf and Pepper corn in it.
3. Place on fire and keep stirring to keep food particle suspended.
4. Bring it to boil and simmer for 1½ Hrs.
5. Strain through double muslin cloth.

Examples

Consomme Alexandra: Chicken consommé thickened with Tapioca and garnished with Juliennes of Chicken, Quenelles and shredded lettuce.

Consomme Andalouse: Consommé blended with Tomato puree and garnished with dices of Royale and dices of tomato, juliennes of ham, boiled rice and vermicelli and threaded eggs.

Consomme Bretonne: Consommé garnished with juliennes of Leek, Celery, Onion and Mushroom with shredded Lettuce.

Consomme Colbert: Consommé garnished with Printaniere of vegetables and small poached eggs.

SOME CONSOMME GARNISHES

BRETON	: Juliennes of Celery, Onion and Leeks
BRUNNOISE	: Small Diced vegetables
DUBARRY	: Flowerettes of cauliflower
FLORENTINE	: Fine strips of blanched Spinach
JULIENNES	: Julienne cuts of vegetables

PAYSANNE	: Fresh vegetables cut in uniform size
ST. GERMAIN	: Fresh green Peas
ROYAL	: Dices of savory egg custard
VERMICELLI	: Fine Noodles
PRINTANIERE	: Small dices of mixed fresh vegetables

UN PASSED SOUPS

Thin soups which are not passed through sieve after preparation and served with solids are known as un passed soups. Un passed soups are of following two types:

1. Broth
2. Bouillon

Broth: Broth is prepared by cooking good quality of stock along with diced Meat, Vegetables and Rice or Barley; and served with solids. Thickening agents such as Rice or Barley or Macaroni etc. are put at the beginning of preparation.

Bouillon: Bouillons are strong Meaty flavoured, clear soup with pieces of vegetables, Meat, Seafood etc. floating in the soup. It is a clear soup served un passed.

2. THICK SOUPS

These are passed thick soup; thickening is done by using some thickening agent such as Starch, Puree etc. they are of following six types:

1. Puree
2. Cream
3. Velouté
4. Chowder
5. Bisque
6. Coulis

Puree: Soups thicken by its main ingredients (E.g. Leguminous plants, Potato or Cereals) and passed through sieve. Consistency of such soups should resembles to cream. These soups are served with Croûtons. E.g. Puree de lentils, Puree de haricot blanc, Puree Parmout, Puree de tomato, Puree de pois faris

Cream: A Soup of creamy consistency which is made with generally puree of vegetables mixed with béchamel or white sauce. It can be finished with cream if required. E.g. Crème de celeri, crème de tomato, crème de champignon

Veloute: A thick soup made from white stock & roux finished with liaison (mixture for thicker) of egg yolk & cream. E.g. Veloute Indinne, Veloute princesse, Veloute celeries

Chowder: A thick soup of American origin prepared from Potatoes, Onion, pieces of bacon, seasonings and seafood. Crackers are added just before service. E.g. Praum chowder, Vegetable Chowder, Oyester Chowder, Pork Chowder etc.

Bisques: These are thickened fish soups generally made from shellfish puree and thickened with rice or cream. Diced fish is served in it. E.g. Crayfish Bisque, Lobster bisque etc.

Coulies: A thick soup prepared from puree of shellfish. Eg. Coulis de crevisses, Coules de crabes.

3. COLD SOUPS

Cold soups are thickened by natural gelatin present in ingredients or by adding starch or puree. They are served cold. Eg. Vichyssoise, Velaille Napolitaine, Veloute de velaille froid, Gelee de velaill aux tomato

4. INTERNATIONAL SOUPS

There are varieties of cold / hot, thick / thin soups placed in this special category, because of their origin. There are some soups originated in a certain locality and are associated with a particular place. Most of these are un-passed one.

Eg.	Soup	Country
	Minestrone	Italy
	Green Turtle Soup	England
	French Onion Soup	France
	Scotch Broth	Scotland
	Mulligatawny	India
	Gazpacho	Spain
	Manhattan Calm Chowder	America
	Camaro	Brazil
	Paprika	Hungary

Care While Preparing Soup

1. Use good quality strong flavoured stock.
2. Garnish should be small so that it can be picked up by soup spoon.
3. Soup should be moderately seasoned.
4. One liter of soup yields five portions.
5. Accompaniments should be crisped

Common Garnish for Soup

- Croutons - Dices or fancy cut bread / toast fried to golden brown color
- Cereals - Rice or barley
- Cream - Unsweetened whisked cream or sour cream
- Meat - Usually small dices or juliennes
- Poultry - Usually small dices or juliennes
- Cheese - Cheese balls, grated parmesan cheese
- Seafood - Diced or flakes of seafood
- Pasta - Noodles or Spaghetti
- Vegetables - Different cuts of vegetables like carrot, turnip etc.

CHECK YOUR PROGRESS-V

Q.1 Define Soup?

Q.2 What ate the various types of soup?

Q.2 Write a note on ‘International Soup’.

4.6 SALADS

According to Merriam-Webster **dictionary**, ‘any of various usually cold dishes: such as raw greens (such as lettuce) often combined with other vegetables and toppings and served especially with dressing, **or** small pieces of food (such as pasta, meat, fruit, or vegetables) usually mixed with a dressing (such as mayonnaise) or set in gelatin is known as salad. According to The new la Larousse Gastronomique, ‘salad are the dishes made up of herbs, plants, vegetables, eggs, meat and fish, seasoned with oil, vinegar, salt and pepper, with or without other ingredients. According to oxford living dictionary, ‘Salad is a cold dish of various mixtures of raw or cooked vegetables, usually seasoned with oil, vinegar, or other dressing and sometimes accompanied by meat, fish, or other ingredients’.

4.6.1 Ingredients of Salad

Freshness and variety of ingredients are essential for high-quality salads. Lettuce, of course, is the first choice for most people, but many other foods can make up a salad. The following tables list, by category, most of the ingredients used in popular salads. You will be able to think of others. Add them to the lists as they occur to you or as they are suggested by your instructor. The lists will be useful when you are creating your own salad ideas.

Following these lists are detailed descriptions of two groups of food that have not been covered in previous chapters and belong especially in the pantry: salad greens and fresh fruits.

Salad Greens: Iceberg lettuce, Dandelion greens, Romaine lettuce, Watercress, Boston lettuce, Arugula, Bibb or limestone lettuce, Radicchio, Loose-leaf lettuce, Mesclun, Escarole, Tatsoi, Chicory or curly endive, Mâche, Frisée, Microgreens, Belgian endive, Sprouts, Chinese cabbage or celery cabbage, Edible flowers, Spinach etc.

Vegetables(Raw): Avocado, Cucumbers, Bean sprouts, Sunchokes (Jerusalem artichokes), Broccoli, Kohlrabi, Cabbage, white, green, and red Mushrooms, Carrots, Onions and scallions, Cauliflower Peppers, red, green, and yellow, Celery, Radishes, Celeriac (celery root), Tomatoes etc.

Vegetables (Cooked/Pickled/ Canned): Artichoke hearts, Hearts of palm, Asparagus, Leeks, Beans (all kinds), Olives, Beets, Peas, Carrots, Peppers, roasted and pickled, Cauliflower, Pimientos, Corn, Potatoes, Cucumber pickles (dill, sweet, etc.), Water chestnuts etc.

Starches: Dried beans (cooked or canned), Macaroni products, Bread (croutons), Potatoes and Grains

Fruits(Fresh/Cooked/Canned, or Frozen) : Apples, Grapes, Peaches, Apricots, Kiwi fruit, Pears, Bananas, Kumquats, Persimmons, Berries, Mandarin, Oranges and tangerines, Pineapple, Cherries, Mangoes, Plums, Coconut, Melons, Prunes, Dates, Nectarines, Pomegranates, Figs, Grapefruit, Papayas, Raisins etc.

Protein Foods: Meats (beef, ham), Bacon, Poultry (chicken, turkey), Eggs, hard-cooked, Fish and shellfish- tuna, crab, Cheese, cottage shrimp, lobster, salmon, sardines, anchovies, herring, Cheese-aged or cured types any fresh cooked fish), Salami, prosciutto, luncheon meats, etc.

Miscellaneous: Gelatin (plain or flavored), Nuts, Lettuce and Other Salad Greens

4.6.2 Salad Dressings

Salad dressings are liquids or semiliquids used to flavor salads. They are sometimes considered cold sauces, and they serve the same functions as sauces—that is, they flavor, moisten, and enrich. Most of the basic salad dressings used today can be divided into three categories:

- Oil and vinegar dressings (most unthickened dressings).
- Mayonnaise-based dressings (most thickened dressings).
- Cooked dressings (similar in appearance to mayonnaise dressings, but more tart, and with little or no oil content).

A number of dressings have as their main ingredient such products as sour cream, yogurt, and fruit juices. Many of these are designed specifically for fruit salads or for low calorie diets. A good salad needs a good dressing to bring out the best flavour, and in the list below we find one or more suitable to any salad we care to produce. To help with this, we differentiate between four basic dressings types, with many variations on the basic theme.

These four are:

- Vinaigrette and its variation

- Mayonnaise-based dressing and its variations
- Acidulated cream and its variations
- Scandinavian sweet and sour dressing

Most, but not all of the variations of dressing are based on the vinaigrette, others on mayonnaise. Some are based on cream, sour cream, or latterly crème fraîche and yoghurt. Even the sweet and sour Scandinavian dressing is getting very popular, as it adds a distinctive new taste to salads. Because the flavors of most salad dressings are not modified by cooking, their quality depends directly on the quality of the ingredients. Most salad dressings are made primarily of oil and an acid, with other ingredients added to modify the flavor or texture.

Type of Oil Used in Salad Dressings: **Corn oil** is widely used in dressings. It has a light golden color and is nearly tasteless, except for a mild cornmeal-type flavor. **Cottonseed oil**, soybean oil, canola oil, and safflower oil are bland, nearly tasteless oils. Vegetable oil or salad oil is a blend of oils and is popular because of its neutral flavor and relatively low cost. **Peanut oil** has a mild but distinctive flavor and may be used in appropriate dressings. It is somewhat more expensive. **Olive oil** has a distinctive, fruity flavor and aroma and a greenish color. The best olive oils are called virgin or extra-virgin, which means they are made from the first pressing of the olives. Because of its flavor, olive oil is not an all-purpose oil but may be used in specialty salads such as Caesar salad. **Walnut oil** has a distinctive flavor and a high price. It is occasionally used in fine restaurants featuring specialty salads. Other nut and seed oils, such as hazelnut oil and grapeseed oil, are sometimes used.

Type of Vinegar Used in Salad Dressings: **Cider vinegar** is made from apples. It is brown in color and has a slightly sweet apple taste. **White or distilled vinegar** is distilled and purified so that it has a neutral flavor. **Wine vinegar** may be white or red, and it has, naturally, a winy flavor. **Flavored vinegars** have had another product added to them, such as tarragon, garlic, or raspberries. **Sherry vinegar** is made from sherry wine and, consequently, has the distinctive flavour of that wine. **Balsamic vinegar** is a special wine vinegar aged in wooden barrels (see sidebar). It is dark brown in color and has a noticeably sweet taste. Other specialty vinegars include malt vinegar, rice vinegar, and vinegars flavored with fruits.

Lemon Juice: Fresh lemon juice may be used in place of or in addition to vinegar in some preparations, when its flavor is desired.

Egg Yolk: Egg yolk is an essential ingredient in mayonnaise and other emulsified dressings. For safety, pasteurized eggs should be used (see pp. 814 and Appendix 5, p. 1058), and the finished product should be refrigerated to guard against spoilage.

Seasonings and Flavorings: Nearly any herb or spice can be used in salad dressings. Fresh herbs are preferable to dried herbs as flavorings, especially when the dressings are used for simple, light mixed green salads. Remember that dried herbs and spices need extra time to release their flavors if they are not heated in the product. This is why most dressings are best made at least two or three hours before serving. Review Chapter 4 to refresh your memory on the use of herbs and spices. Other ingredients added for flavoring include mustard, ketchup, Worcestershire sauce, and cheeses. A note on blue cheese and Roquefort cheese: Many restaurants sell “Roquefort dressing” that is actually blue cheese dressing. Roquefort is a brand name for a special kind of

blue cheese made in Roquefort, France. It is made of sheep's milk, has a distinctive taste, and is expensive. Do not use the term Roquefort for blue cheese dressings unless you are actually using this brand of cheese.

Emulsions in Salad Dressings: As you know, oil and water do not normally stay mixed but separate into layers. Salad dressings, however, must be evenly mixed for proper service, even though they are made primarily of oil and vinegar. A uniform mixture of two unmixable liquids is called an *emulsion*. One liquid is said to be in *suspension* in the other.

Oil-and-Vinegar Dressings: Basic *vinaigrette*, the first recipe in this section, is a simple mixture of oil, vinegar, and seasonings. It can be used as is, but it is usually the base for other dressings, such as the variations that follow. The ratio of oil to vinegar in a basic vinaigrette is 3 parts oil to 1 part vinegar. This is not a divine law, however, and the proportions may be changed to taste. Some chefs prefer a 2:1 ratio, while others prefer a 4:1 or even 5:1 ratio. Less oil makes the dressing more tart, while more oil makes it taste milder and oilier. A very strong vinegar, more than 5 percent acid, may have to be diluted with water before being measured and added to the recipe. For guidelines in the preparation of vinaigrettes, review the discussion of temporary emulsions above. The emulsion in the basic vinaigrette recipe holds only a short time because the formula contains no stabilizers, with the minor exception of a little pepper. To make a good emulsion, mix some mustard with the vinegar, as in the first variation of the basic recipe.

4.6.3 The Structure of a Salad

A plated salad may have as many as four parts: base, body, dressing, and garnish. All salads have body, and most have dressing, but base and garnish are parts of only some salads, as you will see in the following discussion. Of course this discussion refers only to individual plated salads. When we use the term *salad* to refer to a bulk mixture, as in “two pounds of potato salad,” references to the *four parts of a salad* do not apply.

Base / Underliner: Scoop of potato, fancy cut vegetables like carrot, onion, cucumber etc. looks bare when served by itself on a salad plate as a side dish. Placing it on a bed of lettuce leaves or on shredded leaf of cabbage make it more appealing and also emphasizes its identity as a salad. Although most tossed green salads and many composed salads are presented without base, bound salads and some other vegetable salads may be more attractive and appetizing when served on a bed of leafy greens. Cup-shaped leaves of iceberg or Boston lettuce make attractive bases. They give height to salads and help confine loose pieces of food. A layer of loose, flat leaves (such as romaine, loose-leaf, or chicory) or of shredded lettuce may be used as a base. This kind of base involves less labor and food cost, as it is not necessary to separate whole cup-shaped leaves from a head.

Body: This is the main part of the salad.

Garnish: A garnish is an edible decorative item added to a salad for eye appeal, though it often adds to the flavor as well. It should not be elaborate or dominate the salad. Remember this basic rule of garnishing: Keep it simple. Garnish should harmonize with the rest of the salad ingredients and, of course, be edible. It may be mixed with the other salad ingredients (for example, shreds of red cabbage mixed into

a tossed green salad), or it may be added at the end. Often, the main ingredients of a salad form an attractive pattern in themselves, and no garnish is necessary. In the case of certain combination salads and other salads with many ingredients or components, there may be no clear distinction between a garnish and an attractive ingredient that is part of the body. In general, if a salad is attractive and balanced without an added garnish, don't add one. Nearly any of the vegetables, fruits, and protein foods listed on pages 712–713, cut into simple, appropriate shapes, may be used as garnish.

Dressing: Dressing is a seasoned liquid or semiliquid added to the body of the salad for flavor, tartness, spiciness, and moistness. The dressing should harmonize with the salad ingredients. In general, use tart dressings for green salads and vegetable salads and use slightly sweetened dressings for fruit salads. Soft, delicate greens like Boston or Bibb lettuce require a light dressing. A thick, heavy dressing will turn them to mush.

Dressings may be added at service time (as for green salads), served separately for the customer to add, or mixed with the ingredients ahead of time (as in potato salad, tuna salad, egg salad, and so on). A salad mixed with a heavy dressing, like mayonnaise, to hold it together is called a *bound salad*. Remember: Dressing is a *seasoning* for the main ingredients. It should accent their flavor, not overpower or drown them.

Arranging the Salad

Perhaps even more than with most other foods, the appearance and arrangement of a salad are essential to its quality. The colorful variety of salad ingredients gives the chef an opportunity to create miniature works of art on the salad plate. Unfortunately, it is nearly as difficult to give rules for arranging salads as it is for painting pictures because the principles of composition, balance, and symmetry are the same for both arts. It is a skill you must develop an eye for, by experience and by studying good examples.

Guidelines for Arranging Salads:

Keep the salad off the rim of the plate: Think of the rim as a picture frame and arrange the salad within this frame. Select the right plate for the portion size, not too large or too small.

Strive for a good balance of colors: Plain iceberg lettuce looks pale and sickly all by itself, but it can be enlivened by mixing in darker greens and perhaps a few shreds of carrot, red cabbage, or other colored vegetable. On the other hand, don't go overboard. Sometimes just a few shades of green creates a beautiful effect. Too many colors may look messy.

Height helps make a salad attractive: Ingredients mounded on the plate are more interesting than if they are spread flat. Lettuce cups as bases add height. Often just a little height is enough. Arrange ingredients like fruit wedges or tomato slices so they overlap or lean against each other rather than lie flat on the plate.

Cut ingredients neatly: Ragged or sloppy cutting makes the whole salad look sloppy and haphazard.

Make every ingredient identifiable: Cut every ingredient into large enough pieces that the customer can recognize each immediately. Don't pulverize everything in the buffalo chopper or VCM. Bite-size pieces are the general rule, unless the ingredient can be cut easily with a fork, such as tomato slices. Seasoning ingredients, like onion, may be chopped fine.

Keep it simple: A simple, natural arrangement is pleasing. An elaborate design, a gimmicky or contrived arrangement, or a cluttered plate is not pleasing. Besides, elaborate designs take too long to make.

4.6.4 Types of Salads

There are endless number and variety of salads are available, therefore, it is helpful to divide salads into categories in order to understand how they are produced. For the pantry chef, the most useful way to classify salads is by ingredients: green salads, vegetable salads, fruit salads, and so on. Salad may be classified on the following basis:

1. As they appear in menu
2. On the basis of main ingredients

As they appear in menu: On the basis of appearing in various courses salad may be classified in to following categories:

- Appetizer salad
- Accompaniment Salads
- Main-Course Salads
- Dessert Salads

Appetizer Salads: Now a days many establishments serve salads as a first course, often as a substitute for a more elaborate first course. In addition, more elaborate composed salads are popular as appetizers in many elegant restaurants. These often consist of a poultry, meat, or fish item, plus a variety of vegetables and garnishes, attractively arranged on a bed of greens. An Appetizer salads should stimulate the appetite. This means they must have fresh, crisp ingredients; a tangy, flavorful dressing; and an attractive, appetizing appearance.

Accompaniment Salads: Salads can also be served with the main course. They serve the same function as other side dishes (vegetables and starches). Accompaniment salads must balance and harmonize with the rest of the meal, like any other side dish. For example, don't serve potato salad at the same meal at which you are serving French fries or another starch. Vegetable salads are often good choices. Heavier salads, such as macaroni or high-protein salads containing meat, seafood, cheese, and so on, are less appropriate, unless the main course is light.

Main-Course Salads: Cold salad plates have become popular on luncheon menus, especially among nutrition- and diet-conscious diners. The appeal of these salads is in variety and freshness of ingredients Main-course salads should be large enough to serve as a full meal and should contain a substantial portion of protein. Meat, poultry, and seafood salads, as well as egg salad and cheese, are popular choices.

Dessert Salads: Dessert salads are usually sweet and may contain items such as fruits, sweetened gelatin, nuts, and cream. They are often too sweet to be served as appetizers or accompaniments and are best served as dessert or as part of a buffet or party menu.

On the basis of main ingredients: On the basis of main ingredients, salad may be classified in to following categories:

- Leaf salads
- Vegetable salads
- Compound salads
- Special salads

Leaf Salads: A **leaf salad** or **garden salad** is most often composed of leafy vegetables such as lettuce varieties, spinach etc. The salad leaves may be cut or torn into bite-sized fragments and tossed together (called a *tossed salad*), or may be placed in a predetermined arrangement (a *composed salad*). They are often adorned with garnishes such as nuts or croutons.

Preparation of Most Leaf Salads:

1. Always wash lettuce in cold water. Hold by roots, plunging into water to force water to centre, thus removing dirt and grit. Repeat process several times, each time in clean water.
2. Remove bad or discoloured outer leaves.
3. Trim roots and carefully inspect inside for slugs and insects.
4. Remove coarse ribs, from outer leaves with fingers, remove excess stalks.
5. Place into iced water to crisp if necessary.
6. Drain thoroughly. Shake well in a salad basket or colander.
7. Avoid bruising leaves. Place on clean cloth cover with cloth.
8. Keep in a cool place until required.
9. Serve neatly in china, glass or wooden bowls or plate add dressing in last moment.

Examples:

SINGLE GREEN SALAD: As the name suggests it contains only one type of leaf. Yet, a bowl of just green leaves with a suitable dressing is ideal for say a grilled steak or fillet of fish, or indeed roast poultry of all types.

MIXED GREEN SALAD : If we think a single green salad is too simple, we may go up one step and serve a mixed green salad, that is to say a mixture of any green leaves available such as Batavian, Lambs Lettuce, Rocket, Endive Frisés or whatever is available in the range of green.

NAMED LEAF-BASED SALADS

The next group of salads is the named salads, that is to say, their name implies that we should follow a given recipe with always the same ingredients of different leaves and other additions, as well as dressing.

Tarragon Salad: Any green leaves with the addition of freshly chopped tarragon leaves sprinkled on the top plus vinaigrette. Served as a side salad with roast and grilled meats, poultry and fish.

Mimosa Salad: Green leaves with the sieved hard-boiled egg yolk sprinkled on top to give the appearance of the Mimosa blossom. Served as a side salad with roast and grilled meats, poultry and fish.

Orange Salad: Green lettuce leaves with the addition of orange segments and blanched orange peel cut julienne sprinkled on the top. Served as a side salad with roast meats, poultry and game, particularly roast duck and saddle of venison.

New Orleans Salad: Sliced raw button mushrooms on young spinach leaves, dressed with strong garlic dressing. Served as a side salad with roast meats, poultry and grilled steaks and fish of all types.

The single Vegetable salads, sometimes also called in French the simple salads, are produced from vegetables or fruits rather than from leaves, although some of the latter are often used as a base decoration. Single salads may have small additions/garnish, such as lettuce leaves, onion rings, chopped or sprigs of herbs, to give flavour and help presentation. They fall into two groups:

Single **raw** salads: Such as cucumber, radish, tomato etc.

Single **cooked** salads: Which are cooked or blanched before dressing, such as asparagus, beetroot, celeriac, French beans, potato and pulses, pasta salads etc.

Free Combination Mixed Salads

Any two or three of the leaf salads, according to season, may be combined with some two or three single salad ingredients raw or cooked, whatever is in season. Of late, many of the raw grated fruit or/and vegetables salads have become very popular. Here the choice of dressing is requested when ordering or at the table.

COMPOUND SALADS: Our third basic group of salads are the compound salads made from a combination of foods such as fruit, vegetables, fish, shellfish, poultry and meats, of which one ingredient should dominate, sometimes giving the salad its name. For a better understanding when best to serve a given compound salad, they are grouped in the recipes below according to the main base ingredient of their preparation, i.e.:

Fruit-based

Vegetable-based

Fish-based

Poultry-based

Meat-based.

All are marinated in light vinaigrette and thereafter bound with acidulated cream, sour cream, mayonnaise or one of its variations, or, of late, crème fraîche. In Britain these types of salads were until quite recently much underused, only a few such as Waldorf Salad being really well known. On the Continent of Europe and in America they are very popular and found in daily use in all types of catering establishments, served as:

A single hors d'oeuvre

Part of a mixed hors d'oeuvre

A side salad in place of vegetables (vegetable- and fruit-based only)

Part of a mixed salad

Part of a cold buffet.

The preparation of compound salads, as well as the ingredients used, varies considerably from one compound salad to another. Again, only the best materials should be used, well washed, clean and dry. Their preparation, particularly the cutting

of the various food items that make up the salads, is the most important. Care should be taken in the cutting of very neat and even dice, strips or batons.

First, we feature the detailed preparation of eight classical compound salads, including two of the best-known and popular – the Waldorf Salad and Dutch Herring Salad. Many of the points made here can be applied to other salads listed.

Presentation, Garnishes and Borders for Compound Salads

Some presentations have been suggested with each of the compound salads above, but the final appearance is often a very personal thing or restricted by the equipment available in any given establishment. The following items, where and when suitable, may be used to enhance the appearance of the salad:

- Dice, julienne, diamonds, triangles, etc. – of the main ingredient of the salad Neat, blanched or raw rings of onion – not suited everywhere
- Hard-boiled eggs sliced, quartered, as well as coarsely chopped or sieved
- Beetroot cut into diamonds, triangles or half-moon shapes – only with beetroot dishes
- Julienne of whites of eggs, pimentos, mushrooms, ham, tongue – suitable for most salads
- Bouquets of fresh watercress, mustard and cress or rocket – suitable for many salads
- Quartered hearts of lettuce, whole sliced radishes, cucumber, tomatoes and spring onions

On occasion tartlets, banquettes, puff-pastry bases as well as croutons or fleurons are very helpful as a base in the presentation of compound salads, particularly when these are served as a starter in individual portions.

CHECK YOUR PROGRESS-VI

Q.1 Define Salad?

Q.2 What are the various types of salad?

Q.3 Write a note on ‘Salad Dressings’.

4.7 Garnish

To many people, the word garnish means a sprig of parsley haphazardly placed on the plate. Just as common is the practice in some restaurants of adopting a single garnish and using it routinely on every plate, from prime rib to batter-fried shrimp. No one garnish is appropriate for every plate, just as no one side dish is appropriate for every plate. In fact, the term garnish has been used for a great variety of preparations and techniques in the history of classical and modern cuisines. Today, the use of parsley sprigs on every plate has become rare, and we are again using the word garnish in a more traditional way.

Classical Garnish

In classical cooking, the terms garnish and garniture have been used the way we use the term accompaniments. In other words, garnishes are any items placed on the platter or plate or in the soup bowl in addition to the main item. It happens that these accompaniments also make the food look more attractive, but that is not the emphasis.

The classical French chef had a tremendous repertoire of simple and elaborate garnishes, and they all had specific names. A trained chef, or a well-informed diner, for that matter, knew the word Rachel on the menu meant the dish was served with artichoke bottoms filled with poached marrow, and Portugaise meant a garnish of stuffed tomatoes.

There were so many of these names, however, that no one could remember them all. So they were catalogued in handbooks to be used by chefs. *Le Répertoire de la Cuisine*, first published in 1914 and one of these handbooks has 209 listings in the garnish section alone, not to mention nearly 7,000 other preparations, all with their own names. The garnishes may be as simple as the one called Concorde or as complex as the one called Tortue, quoted here to give you an idea of the complexity and elaborateness of classical garnish.

Concorde (for large joints)-Peas, glazed carrots, mashed potatoes.

Tortue (for Entrées)-Quenelles, mushroom heads, gherkins, garlic, collops of tongue and calves' brains, small fried eggs, heart-shaped croutons, crayfish, slices of truffles, Tortue sauce.

Many of the classical names for garnishes are still used in modern kitchens, although they have lost the precise meanings they once had. You will encounter some of these terms in your career, so it is worthwhile learning them. Remember that the following

definitions are not the classical ones but simply the garnish or accompaniment generally indicated by the terms in today's kitchens.

Bouquetière	: bouquet of vegetables
Printanière	: spring vegetables
Jardinière	: garden vegetables
Primeurs	: first spring vegetables

Some of the common terms used in garnish and its meaning are as under:

Clamart	: peas
Crécy	: carrots
Doria	: cucumbers (cooked in butter)
Dubarry	: cauliflower
Fermière	: carrots, turnips, onions, and celery, cut into uniform slices
Florentine	: spinach
Forestière	: mushrooms
Judic	: braised lettuce
Lyonnaise	: onions
Nicoise	: tomatoes concassé cooked with garlic
Parmentier	: potatoes
Princesse	: asparagus
Provençale	: tomatoes with garlic, parsley, and, sometimes, mushrooms and/or olives
Vichy	: carrots (especially Carrots Vichy)

Hot Platter Garnish

In classical cuisine, food was nearly always brought to the dining room on large platters and then served, rather than being plated in the kitchen, as is most often done today. Platter garnish need not be elaborate or difficult to prepare. A simple assortment of colourful vegetables, carefully cut and properly cooked to retain colour and texture, is appropriate to the most elegant presentation. Stuffed vegetables, such as tomato halves filled with peas, are a little fancier, but still easy to prepare. Borders of duchesse potatoes are also popular. Following are a few more guidelines that apply to hot platter presentation and garnish.

1. Vegetables should be in easily served units: In other words, don't heap green peas or mashed potatoes on one corner of the platter. More suitable are vegetables such as cauliflower, broccoli, boiled tomatoes, asparagus spears, whole green beans, mushroom caps, or anything that comes in large or easy-to-handle pieces. Small vegetables such as peas can be easily served if they are used to fill artichoke bottoms, tomato halves, or tartlet shells.
2. Have the correct number of portions of each item: Vegetables like Brussels sprouts and tournéed carrots are easily portioned in the dining room if they are arranged in little portionsize piles.
3. Arrange the garnishes around the platter to get the best effect from the different colors and shapes: The meat, poultry, or fish is usually placed in the centre of the platter, or in a row or rows, and the garnishes arranged around it.
4. Avoid being too elaborate: While it is sometimes desirable to make ornate platters, simplicity is usually preferable to an overworked appearance. Let the attractiveness of the food speak for itself. The garnish should never dominate or hide the meat, which is the center of attention.

5. Serve extra sauce or gravy in a sauceboat: If it is appropriate, dress or nap the meat or fish items with some of the sauce, but don't drown the entire platter with it.
6. Serve hot foods hot, on a hot platter: Don't spend so much time arranging the food that it's cold by the time it reaches the dining room.

CHECK YOUR PROGRESS-VII

Q.1 Define Garnish?

Q.2 Write a note on 'Classical Garnish'.

Q.3 Write a note on 'Hot Platter Garnish'.

4.8 Summary

In this unit we have learnt about basics of food production. The unit begins with stock-the foundation, for various sauce, soup and gravies. Then we have discussed about the mother or basic six sauces and their derivatives. Then the unit discusses the marinades and garnishes.

4.9 Key Terms

Bouquetière : bouquet of vegetables

Cereals: Rice or barley

Cheese: Cheese balls, grated parmesan cheese

Clamart : peas

Cream: Unsweetened whisked cream or sour cream

Crécy : carrots

Croutons: Dices or fancy cut bread / toast fried to golden brown color

Doria : cucumbers (cooked in butter)

Dubarry : cauliflower

Fermière : carrots, turnips, onions, and celery, cut into uniform slices

Florentine : spinach

Forestière : mushrooms

Jardinière : garden vegetables

Judic : braised lettuce

Lyonnaise : onions

Meat: Usually small dices or juliennes

Mimosa Salad: Green leaves with the sieved hard-boiled egg yolk sprinkled on top to give the appearance of the Mimosa blossom. Served as a side salad with roast and grilled meats, poultry and fish.

New Orleans Salad: Sliced raw button mushrooms on young spinach leaves, dressed with strong garlic dressing. Served as a side salad with roast meats, poultry and grilled steaks and fish of all types.

Niçoise : tomatoes concassé cooked with garlic

Orange Salad: Green lettuce leaves with the addition of orange segments and blanched orange peel cut julienne sprinkled on the top. Served as a side salad with roast meats, poultry and game, particularly roast duck and saddle of venison.

Parmentier : potatoes

Pasta: Noodles or Spaghetti

Poultry: Usually small dices or juliennes

Primeurs : first spring vegetables

Princesse : asparagus

Printanière : spring vegetables

Provençale : tomatoes with garlic, parsley, and, sometimes, mushrooms and/or olives

Seafood: Diced or flakes of seafood

Tarragon Salad: Any green leaves with the addition of freshly chopped tarragon leaves sprinkled on the top plus vinaigrette. Served as a side salad with roast and grilled meats, poultry and fish.

Vegetables: Different cuts of vegetables like carrot, turnip etc.

Vichy : carrots (especially Carrots Vichy)

4.10 References/Bibliography

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4.11 Review Questions

Fill in the Blanks

1. Salads are a preparation consisting of _____ ingredients.
2. The four basic parts of a salad are base, _____, dressing, and garnish.
3. The main purpose of a garnish is to add _____ to the finished product.
4. Bibb lettuce is also known as _____ lettuce.
5. Salads may be served as a(n) _____ or an accompaniment to other foods.
6. _____ lettuce is very tender and has a mild, sweet flavor.
7. Crispness can be improved by letting greens soak in cold water with _____ added for a short period of time.
8. A small firm compact head of ruby red leaves is _____.
9. All lettuce should be kept _____ in the refrigerator until ready to use.
10. Salad preparations should be neat, _____, and appetizing.
11. _____ is too bitter to be used alone in a salad.
12. The salad garnish should be kept _____ at all times.

13. Vegetable salads contain foods that have a variety of _____ and natural colors.
14. The two types of vegetable salads are cooked and _____.
15. Most fruit salads depend on _____ the fruit in an attractive way.
16. The deeper the _____ of salmon is, the better the quality is.
17. The most desirable tuna to use in salad preparation is light meat packed in _____.
18. Dissolve gelatin thoroughly in hot liquid before adding the _____.
19. To ensure even distribution of the ingredients, the gelatin must be slightly _____ before adding mayonnaise, sour cream, fruit, or vegetables.
20. French dressing may be prepared by forming either a temporary or permanent _____.
21. Boston lettuce is also known as _____ lettuce.
22. _____ lettuce is the most popular salad green.
23. Seafood salads require meat with a(n) _____ flavor.
24. Fruit salads are fragile and _____ rapidly when cut and exposed to air.
25. Pasta used in pasta salads should be cooked _____ for best results.
26. Using proper techniques to remove cores and cut lettuce will avoid _____ and extend keeping times.

True – False

1. Salads can be prepared from a wide range of foods.
2. Salads are served only as side dishes to accompany other foods.
3. A stretcher is added to mayonnaise to improve the flavor and eating qualities.
4. The most common method of classifying salads is by the ingredients used.
5. Pasta salads are inexpensive to prepare.

Multiple Choice Questions

1. The most popular type of salad served is the _____ salad.
A. Gelatin B. Fruit
C. Meat D. Leafy green
2. A salad can be best defined as a blend of _____ ingredients.
A. Fresh B. Cold
C. Crisp D. Tender
3. A fish commonly used in seafood salads is _____.
A. Tuna B. Crab
C. Shrimp D. all of the above.
4. _____ oil is not recommended when preparing mayonnaise because of its strong flavor.
A. Olive B. Peanut
C. Cottonseed D. Soybean

Long Answer Question

1. Q. Write short notes on:
 - a. Stock and its types
 - b. Mother Sauce
 - c. Types of Soup
 - d. Marinades
 - e. Garnish
2. What is salad?
3. Write a note on Salad Dressings.
4. What are the different types of salad?
5. What are the components of salad?
6. Define stock? What are different types of stock?
7. Write a note on care while preparing stock?
8. What do you mean by term 'Glaze'?
9. Define sauce?
10. Write a short note of 'Basic Mother Sauces'.
11. Write note on Thickening agents used for sauces.
12. Define soup?
13. Classify soups with examples.
14. Write a note on Salad dressings.
15. What are the various parts of salad?
16. Write a note on Types of salad.
17. Define garnish?
18. Write a note on Classical Garnish.