

# FOOD PRODUCTION AND PATISSERIE - I

B.Sc.  
(Catering Science and Hotel Management)

First Year, Part III, Paper 1

School of Distance Education

Bharathiar University, Coimbatore - 641046

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## SYLLABUS

Year	Part	Subject and Paper	Theory
I	III	FOOD PRODUCTION AND PATISSERIE - I	100

### Unit – I

Aims & Objectives of cooking food.

Foundation ingredients - fats, oils and their uses. Raising agents - their uses and types. Eggs - Egg cookery, storage, uses, characteristics. Salt- uses.

Flavouring and Seasonings, sweetening agents, Thickening agents.

### Unit – II

Preparation of Ingredients – Washing, peeling, Scrapping, cutting of vegetables, method of mixing foods, methods of cooking foods.

Stock - Meaning, uses, points to be observed when preparing recipe for mother sauces, Names and derivatives of mother sauce.

### Unit – III

Meaning of herbs, uses,

Meaning of spices, condiments and uses,

Meaning of Glace and its uses.

Meaning of Salami, Sausages- types,

Meaning of yoghurt, types. Types of Cream.

Types of Cereals. Types of pulses.

Meaning of Game With examples.

Types of fruits. Common nuts used in cookery.

Kitchen equipments.

Cooking fuels.

Kitchen organizations - Duties and responsibilities of kitchen staff.

### Unit – IV

Hors d' oeuvre - Meaning, types, examples

Soup- Types of soups, Classification.

Pasta- Meaning, types.

Fish- Classification, selection procedures, cuts, and cooking of fish.

Butchery- Selection cuts, size, and uses of lamb, mutton, veal, beef, and pork.

Steak- Meaning, Description of fillet steak and sir loin streak.

Bacon, ham, gammon- Meaning.

Chicken- Classification, Selection procedures, cuts, and uses.

### Unit – V

Sandwiches- Meaning, types of bread used, different types of sandwiches.

Vegetables- Classification, uses.

Different styles of potato preparation.

Cheese- Preparation, Classification and storage.

Principles of food storage.

Re-heating of foods- Meaning, points to be observed.

# UNIT I

## LESSON 1

### AIMS AND OBJECTIVES OF COOKING FOOD

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1.7	Effects of Cooking on Different Types of Ingredients
1.8	Culinary Art
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1.9	Cuisine
1.10	Let us Sum Up
1.11	Lesson End Activity
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#### 1.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Aims and objectives of cooking food
- Advantages of cooking food
- Cooking materials
- Food constituents
- Effects of cooking food on food constituents
- Effects of cooking food on various ingredients

#### 1.1 INTRODUCTION

Cooking is the act of preparing food for eating by the application of heat. It encompasses a vast range of methods, tools and combinations of *ingredients* to alter the flavor or digestibility of

food. It is the process of selecting, measuring and combining of ingredients in an ordered procedure in an effort to achieve the desired result. Factors affecting the final outcome include the variability of ingredients, ambient conditions, tools, and the skill of the individual doing the actual cooking.

Cooking is an art. It is linked with the dietary habits and cultural pattern of people. The intention of cooking is to see that the food cooked undergoes a physical and a chemical change at the end result is edible and acceptable.

Applying heat to a food usually, though not always, chemically transforms it, thus changing its flavor, texture, consistency, appearance, and nutritional properties.

The art of cooking is ancient. There is archaeological evidence of roasted foodstuffs, both animal and vegetable, in human camp sites dating from the earliest known use of fire, some 800,000 years ago. Other methods of cooking that involve the boiling of liquid in a receptacle have been practiced at least since the 10th millennium BC, with the introduction of pottery.



Figure 1.1 Ancient Cooking

## 1.2 COOKING

Cooking is the application of heat to food for the purpose of making it more digestible, safer to eat, more palatable and to change its appearance. To cook food, heat must be introduced. In the cooking process the heat breaks down the cellulose in the plant, softens some of the connective tissues in the meat, changes and blends flavours within the food and destroys bacteria, makes food more acceptable to human beings and their digestive system.

## 1.3 AIMS AND OBJECTIVES OF COOKING FOOD

- 1) Cooking increases *palatability*. Cooking pleases the eye and is receptive to the palate and helps to stimulate the digestive juices, thereby creating an appetite.



- 2) Cooking helps to provide a balanced meal. The different ingredients combined together in one dish make it easier to provide a balanced meal.
- 3) Cooking sterilizes the food partially. Cooked food can be stored for a longer time and it prevents food poisoning and diseases when stored properly. Some of the disease producing germs is killed by cooking. They are killed because of high temperature during the cooking process. A temperature of 600°C applied over 30 or more minutes, kills most of the pathogenic germs.
- 4) Cooking retains, as far as possible, the nutritive and flavouring ingredients. The flavour depends upon the amount and kind of extractive present, and the acids developed. Nutritive value is enhanced if the fat proportion in the meat is more. While cooking, the nutrition could be preserved by using the cooking liquor.
- 5) Cooking gives a variety to the menu, as one food item could be cooked in various ways and given different textures, e.g. mutton in a soup, roast joint, croquettes, stews, keema, sookha meat, boti kababs, etc. Different methods of cooking when used make the menu interesting and enhance variety. It is, therefore, easier to plan a balanced diet.
- 6) Cooking preserves food for a longer time. The high temperature destroys bacteria and limits spoilage. It is economical as the cooked leftovers could be utilized and new dishes could be prepared.

#### 1.4 ADVANTAGES OF COOKING

The following are the advantages of cooking:-

- Cooking makes the food easy to chew.
- Cooking softens the connective tissues in the meat and makes animal foods more digestible.
- Cooking makes the complex foods split into simpler substances.
- Cooking helps to kill harmful bacteria. It makes the food safe to eat.
- Cooking preserves the food.
- Cooking increases palatability. It improves taste and enhances the flavour.
- A wide variety of dishes can be made by different methods of cooking *v i z .* boiling, frying, roasting, microwaving, baking, smoking, etc.
- Cooking makes the dish more colorful. It develops new flavors in food.
- Cooking makes the food to appreciable texture.
- Cooking makes food more *appetizing*
- Cooking provides balanced meal.
- Cooking adds more nutritive value to food.

## 1.5 FOOD CONSTITUENTS

Food is composed of the following five constituents:

- Carbohydrates
- Fats
- Proteins
- Minerals
- Vitamins

### Carbohydrates:

Carbohydrates used in cooking include simple sugars such as glucose (from table sugar) and fructose (from fruit) and starches from sources such as cereal flour, rice, arrowroot and potato.



Figure 1.2 Sources of Carbohydrates

### Fats:

Fats and oils come from both animal and plant sources. In cooking, fats provide tastes and textures. When used as the principal cooking medium (rather than water), they also allow the cook access to a wide range of cooking temperatures.



Figure 1.3 Fats & Oils

Common oil-cooking techniques include sauteing, stir-frying, and deep-frying. Commonly used fats and oils include butter, olive oil, sunflower oil, lard, beef fat (both dripping and tallow), rapeseed oil or canola, and peanut oil. The inclusion of fats tends to add flavour to cooked food.

### Proteins:

Edible animal material, including muscle, offal, milk and egg white, contains substantial amounts of protein. Almost all vegetable matter (in particular legumes and seeds) also includes proteins, although generally in smaller amounts. These may also be a source of essential amino acids.



Figure 1.4 Sources of Protein

### Minerals:

Minerals are the chemical elements required by living organisms, other than the four elements carbon, hydrogen, nitrogen, and oxygen which are present in common organic molecules. Sometimes these "minerals" come from natural sources such as ground oyster shells. Sometimes minerals are added to the diet separately from food, such as mineral supplements, the most famous being iodine in "iodized salt."



Figure 1.5 Sources of Mineral

Other minerals are calcium, chloride, magnesium, phosphorus, potassium, sodium and sulphur. These minerals are obtained from milk, other dairy products, cereals, legumes, bone meal, meat, fish, all fruits, vegetables, table & sea salt etc.

### **Vitamins:**

Vitamins are essential for the normal growth and development. It is a key nutrient that the body needs in small amounts to grow and stay strong. Examples are vitamins A, C, and E. Vitamins are found in many fruits and vegetables; especially green peppers, citrus, strawberries, tomatoes, broccoli, leafy greens, potatoes, animal foods; such as liver, whole eggs and milk.



Figure 1.6 Vegetables and Fruits Rich in Vitamin

## **1.6 EFFECTS OF COOKING**

The effect of cooking upon the food constituents are discussed below:-

### **1.6.1 Action of Heat on Carbohydrates**

The interaction of heat and carbohydrate is complex. Long-chain sugars such as starch tend to break down into more simple sugars when cooked, while simple sugars can form syrups. If sugars are heated so that all water of crystallisation is driven off, then caramelisation starts, with the sugar undergoing thermal decomposition with the formation of carbon and other breakdown products producing caramel.

An emulsion of starch with fat or water can, when gently heated, provide thickening to the dish being cooked. In European cooking, a mixture of butter and flour called a roux is used to thicken liquids to make stews or sauces. In Asian cooking, a similar effect is obtained from a mixture of rice or corn starch and water. These techniques rely on the properties of starches to create simpler *mucilaginous saccharides* during cooking, which causes the familiar thickening of sauces. This thickening will break down, however, under additional heat.

### **1.6.2 Action of Heat on Proteins**

When proteins are heated they become de-natured and change texture. In many cases, this causes the structure of the material to become softer or more friable - meat becomes cooked. Cooking at ordinary temperatures renders protein foods more

digestible. At high temperatures the protein itself gets denatured thus making it of nutritive value. In some cases, proteins can form more rigid structures, such as the coagulation of albumen in egg whites.

### **1.6.3 Action of Heat on Fats**

Fat melts when it comes in contact with heat. If heated to a very high degree for a long time, fats undergo partial decomposition and fatty acids and glycerol are produced. Glycerol further decomposes into caroling which is an irritating compound to the digestive system. When fat heated for long time at too slow temperature it thickens, becoming gummy. This condition is known as polymerization, and fat that has reached this stage is no longer fit for use.

### **1.6.4 Action of Heat on Minerals**

There is no appreciable loss of minerals due to cooking. Some minerals are made more readily available by cooking.

### **1.6.5 Action of Heat on Vitamins**

There is some unavoidable loss of vitamins during cooking. The loss is considerable in respect of thiamine and vitamin C. Vitamin A and D are not destroyed by the ordinary methods of cooking. Vitamin B may be destroyed during cooking if cooked at high temperature. The use of baking soda in cooking causes further destruction of vitamins.

## **1.7 EFFECTS OF COOKING ON DIFFERENT TYPES OF INGREDIENTS**

### **Cereals:**

Rice is washed before cooking. Excessive washing removes the water-soluble vitamins and mineral. The proactive of cooking rice in large quantities of water and draining away the excess of water at the end of cooking leads to further loss of B-group vitamins and minerals. Rice, therefore, must be cooked with just enough water so that all the water is absorbed at the end of cooking-this is usually 2 or 2 ½ times the volume of rice. All cereals (eg. water flour) absorb water and during cooking the starch granules swell up and burst. This renders the digestion of starch rapid and complete.

### **Pulses:**

Pulses are rich in protein (20 to 25 per cent). They also contain small quantities of starch. It is very important to boil pulses very thoroughly. This destroys the antitypic substance present in them.

### **Green Leafy Vegetables:**

Green leafy vegetables are prized for vitamins and minerals. The vitamin A which occurs in the form of thiamine and vitamin C are partially destroyed by cooking. If the cooking water is drained away, there will be loss of not only vitamins but also minerals. It is therefore recommended that green leafy vegetables should be cooked in a small amount of water and for the proper length of time. Baking soda should not be used to hasten cooking.

### **Other Vegetables:**

Vegetables like potatoes should be cooked with their outer skin intact; this retains all the vitamins and minerals contained in them. As a rule, vegetables should be cooked in a small amount of water to prevent loss of vitamins and minerals. They can also be cooked by steaming.

### **Cooking of Fruits:**

Most fruits are eaten fresh and raw. This makes the vitamins present in fruits easily available. Fruits can also be cooked by stewing; this will result in loss of some vitamins, particularly, vitamin C.

### **Cooking of Meat:**

Meat is cooked in a number of ways. While cooking, meat *coagulation* of protein is at 60°C.

- There is reduction in water content; consequently there is shrinkage of meat,
- Collagen which is a protein of the connective tissues is changed into gelatin,
- Elastic, which is also component of connective tissue is not affected,
- The fat of meat melts,
- There is loss of mineral in cooking water but this water can be used as soup or gravy,
- Loss of B-group vitamins especially thiamine.

### **Cooking of Fish:**

Fish contains so little connective tissue, that the cooking time is very short. The proteins coagulate at 60°C.

### **Cooking of Milk:**

When milk is heated, a scum consisting of fat, forms on the surface. This makes it difficult for steam to escape; hence milk boils over easily. Some of the lactalbumin sticks to the sides and bottom. Prolonged boiling alters the taste of milk.

The cooked flavour is due to burning or caramelization of milk sugar. There is destruction of thiamine and vitamin C during boiling. Milk, which is already a poor source of vitamin C becomes poorer at the end of boiling. Boiling destroys enzymes and the useful lactic acid bacteria present in milk.

### **Cooking of Eggs:**

The albumin of the egg begins to coagulate at 60°C; and solidifies at 64°C – 65°C. At boiling point (100°C), the albumin becomes tough. However there is little change in the nutrients present in the egg.

## **1.8 CULINARY ART**

Culinary art is the art of cooking. The word "culinary" is defined as something related to or connected with cooking or kitchens. A culinarian is a person working in the culinary arts. A culinarian working in restaurants is commonly known as a cook or a chef. Culinary artists are responsible for skillfully preparing meals that are as pleasing to the palate as to the eye. Increasingly they are required to have knowledge of the science of food and an understanding of diet and nutrition. They work primarily in restaurants, fast food franchises, delicatessens, hospitals and other institutions and corporations. Kitchen conditions vary depending on the type of business, restaurant, nursing home etc.

### **1.8.1 Careers in Culinary Arts**

The culinary arts profession is made up of people who work either directly or indirectly in the preparation and service of food items in the public or private sector. They work in a range of establishments including, but not limited to hotels, full-service restaurants, private clubs, corporate dining, institutional catering, caterers, and home meal replacement (carry-out). With the increased demands of the consumers for nutrition, quality, sophistication in all parts of the culinary industry, today's culinary professional needs to be well trained and prepared to meet the consumers demands.

## **1.9 CUISINE**

Cuisine is a specific set of cooking traditions and practices, often associated with a specific culture. Religious food laws can also exercise a strong influence on cuisine. A cuisine is primarily influenced by the ingredients that are available locally or through trade. For example, the American-Chinese dish chop suey clearly reflected the adaptation of Chinese cuisine to the ingredients available in North America.



### CHECK YOUR PROGRESS

1. What is cooking?  
.....  
.....
2. True or False
  - (i) Cooking adds more nutritive value to food.
  - (ii) The foundation ingredient must only be a liquid.
  - (iii) Sodium bicarbonate is a biological leavening agent.
  - (iv) Fats and oil come from both animal and plant sources.
  - (v) Iodised salt is rich in minerals.
3. Name the five constituents of food?  
.....  
.....

### 1.10 LET US SUM UP

Cooking is an act of preparing food for eating. It encompasses a vast range of methods, tools and combinations of ingredients to improve the flavour or digestibility of food. It generally requires the selection, measurement and combining of ingredients in an ordered procedure in an effort to achieve the desired result.

Cooking tenders the food easy to digest. It makes mastication easier. It lends a new flavour and thereby stimulates digestive juices. It sterilizes food by killing microorganisms and parasitic ova and eggs. It introduces variety, that is, many different cooking increases the acceptability of food, whereas bad cooking may lead to rejection of even highly nutritious attractive foods. Different raw materials are used in cooking to produce a complete dish. Each ingredient in a dish has a special part to play. The materials are classified according to the part they play in making up a dish. The effects of cooking on the chief constituents of food are visible in their increased digestability.

Culinary art is the art of cooking. The culinary arts profession is made up of people who work either directly or indirectly in the preparation and service of food items in the public or private sector. Cuisine is a specific set of cooking traditions and practices, often associated with a specific culture.

### 1.11 LESSON END ACTIVITY

1. Visit a kitchen. Identify some of the raw materials discussed above.
2. Cook the following food items and observe the effect of cooking:
  - i) Oil
  - ii) Fruits
  - iii) Vegetables
  - iv) Meat
  - v) Milk



3. Justify in your own words, with appropriate reasons, why you have chosen hotel management as your profession.

Aims and Objectives  
of Cooking Food

### 1.12 KEY WORDS

<b>Ingredients</b>	An ingredient is the raw material that forms a part of a mixture used for cooking. For example, in cooking, recipes specify which ingredients are used to prepare a specific dish.
<b>Palatability</b>	The property of being acceptable to the mouth
<b>Appetizing</b>	Appealing to or stimulating the appetite especially in appearance or aroma
<b>Margarine</b>	A spread made chiefly from vegetable oils and used as a substitute for butter
<b>Lard</b>	Soft white semisolid fat obtained by rendering the fatty tissue of the hog
<b>Suet</b>	The fat surrounding the kidneys and loin of an animal. It is used in stuffings, mincemeat and plum pudding.
<b>Mucilaginous</b>	Having the sticky properties of an adhesive.
<b>Saccharide</b>	Any of a series of sweet-tasting, crystalline carbohydrates, especially a simple sugar (a monosaccharide) or a chain of two or more simple sugars (a disaccharide, oligosaccharide, or polysaccharide). Glucose, lactose, and cellulose are saccharides.
<b>Coagulation</b>	The curdling, stiffening, or clumping of protein strands usually due to the application of heat or acid.
<b>Restaurant</b>	A building (or part of a building) or any place used as a place where meals or sandwiches are prepared and/or served to its clientele.
<b>Delicatessen</b>	A shop that sells cooked or prepared foods ready for serving (take home food).

### 1.13 QUESTIONS FOR DISCUSSION

1. What are the aims and objectives of cooking?
2. Discuss the advantages of cooking.
3. Explain the food constituents.
4. What are the various effects of cooking on food constituents?
5. What are effects of cooking on different ingredients?
6. Write a short note on culinary art.

### CHECK YOUR PROGRESS - ANSWER

1. Cooking is the application of heat to food for the purpose of making it more digestible, safer to eat, more palatable and to change its appearance.
2. True or False
  - (i) True
  - (ii) False
  - (iii) False
  - (iv) True
  - (v) True
3. Food is composed of five major constituents. They are carbohydrates, fats, proteins, minerals and vitamins.

### 1.14 REFERENCES

1. Auguste Escoffier (1979), The Complete Guide to the Art of Modern Cookery, Heinemann.
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## LESSON 2

### COOKING MATERIALS

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- 2.1 Introduction
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  - 2.11.2 Egg Cookery
  - 2.11.3 Uses of Eggs
- 2.12 Let us Sum Up
- 2.13 Lesson End Activity
- 2.14 Key Words
- 2.15 Questions for Discussion
- 2.16 References

## 2.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Cooking materials
- Foundation ingredient
- Fats & oils – its characteristics and uses
- Salt and its uses
- Raising agents – biological, chemical, mechanical
- Liquids
- Flavourings and seasonings – important spices and herbs
- Sweetenings – sugar and its uses
- Thickenings and various thickening agents
- Eggs – storage, egg cookery and uses of egg

## 2.1 INTRODUCTION

One of the slogans of the World War, “Food will win the war” showed that food was much more important than many persons had believed. It confirmed the fact that food was not merely something that tastes good, or relieves the sensation of hunger, but that it was a vital factor in achieving one of the noblest ideals of all time.



*White Idli's, Crispy Vadai, Sambar & Chutney's*



*Ghee Pongal, Sambar & Chutney*



*Masala Dosai, Sambar & Chutney's*



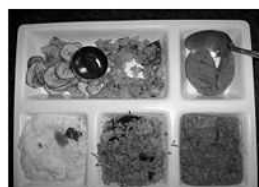
*Fluffy Poori's, Potato Sabji & Chutney's*



*Paratha's, Veg Kuruma, Onion Raitha (Yogurt with raw onions, green chillies)*



*Idli's soaked in a bowl of Sambar*



*Quick Lunch - Sweet, Sambar Rice, Tamarind Rice, Curd Rice, Chips and a Veg curry*



*North Indian Thali - Poori's with cups of Dal, Sambar, Rasam, 2 Kootu's, 2 Porial's, Yogurt, Raitha and Sweet*



*South Indian Thali - Rice & Roti with cups of Dal, Sambar, Rasam, Kootu, 3 Porial's, Yogurt & Sweet*

Figure 2.1 Indian Dishes

For the preparation of good, tasty and colourful dishes, it is essential to have a basic knowledge of the raw materials, their characteristics and the special part they play. This knowledge helps to substitute materials when necessary, or rectify the texture and taste if something goes wrong. Also it helps to improve the quality and get standard end product.

## 2.2 COOKING MATERIALS

Different raw materials are used in cooking to produce a complete dish. Each ingredient in a dish has a special part to play and knowledge of what each food does is necessary to understand cooking thoroughly. The materials are classified according to the part they play in making a dish. The following is the major classification of raw materials:

- |                          |                               |
|--------------------------|-------------------------------|
| 1) Foundation ingredient | 6) Flavourings and seasonings |
| 2) Fats & oils           | 7) Sweetenings                |
| 3) Salt                  | 8) Thickenings                |
| 4) Raising agents        | 9) Eggs                       |
| 5) Liquids               |                               |

## 2.3 FOUNDATION INGREDIENT

An ingredient is any substance used in the manufacture or preparation of a foodstuff and still present in the finished product, even if in an altered form. Contaminants and adulterants are not considered to be ingredients.

The foundation ingredient can be a liquid or a solid. Example: flour in bread, meat in roast, milk or stock in soups. Every dish has a foundation ingredient on which the other ingredients are based. It is necessary to know the proportions of various ingredients and also the composition of the different ingredients and the action of heat on these. Heat may not affect the whole material but only certain constituents.

## 2.4 FATS AND OILS

Fats consist of a wide group of compounds that are generally soluble in organic solvents and largely insoluble in water. Fats may be either solid or liquid at normal room temperature and melt when heated. Example: butter, *margarine*, *lard*, *suet*, dripping and hydrogenated fat.

Cooking oil is purified fat of plant or animal origin, which is liquid at room temperature. Some of the many different kinds of edible vegetable oils include: olive oil, palm oil, soybean oil, canola oil, pumpkin seed oil, corn oil, sunflower oil, peanut oil, grape seed oil, sesame oil, argan oil and rice bran oil. Many other kinds of vegetable oils are also used for cooking.

Fats and oils are nutritionally useful. It gives a satiety value to the dish. They also contribute characteristic palatability, qualities of flavour and texture. They are popularly used as the medium of cooking.

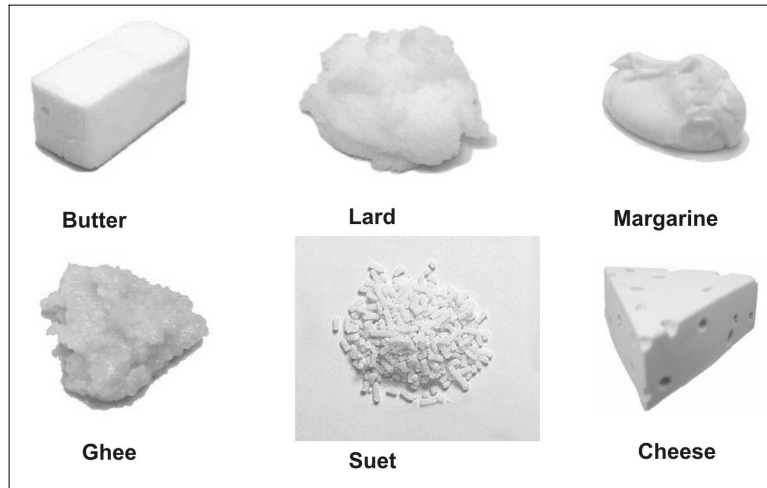


Figure 2.2 Fats

Fats are solid at ordinary temperature and melt when heated. Oils are liquids at ordinary temperature but solidify at low temperatures.

#### 2.4.1 Characteristics of Fats and Oils

Heating oil changes its characteristics. Some oils that are healthy at room temperature can become unhealthy when heated above certain temperatures. When choosing a cooking oil, it is therefore important to note the oil's heat tolerance, and to match the oil to its use in cooking. Oils that are suitable for high temperature frying (above 280°C / 500°F) include:

- Almond oil
- Apricot kernel oil
- High-oleic safflower oil or sunflower oil
- Carotino oil
- Peanut oil
- Soybean oil

Oils suitable for medium temperature frying include Carotene oil, canola oil, walnut oil, sunflower oil, sesame oil. Unrefined oils should be restricted to temperatures below 105°C / 225°F.

Oils with lower amounts of saturated fats, and higher amounts of unsaturated (preferably monounsaturated) fats, are generally healthier.

Transfats are unsaturated fats that are not required or beneficial for health. Hydrogenation, a process that adds hydrogen atoms to fat molecules to make them more saturated, is responsible

for most dietary trans fats. Oils are hydrogenated to increase their melting point (for example in making margarine).

### 2.4.2 Uses of Fats and Oils

Fats and oils are used for various purposes, the major culinary part, played by them are:

- (i) Frying media
- (ii) Shortenings
- (iii) Spreads
- (iv) Salad dressings
- (v) Tempering

#### **Frying Media:**

Fats and oils are used as a medium of cooking i.e. pan roasting, frying and *sautéing*. When fats or oils are heated, a temperature is reached at which visible fumes appear which is defined as smoke point. Fats with high smoke point are suitable for frying. Smokepoint is not the same for different fats.

#### **Shortenings:**

Fats are used in confectionery to enrich the food and to impart to them short eating qualities. Collectively they are referred to as shortening agents. Their effect is to break down or destroy the toughness of *gluten*, so that instead of being hard and tough to eat, food containing fat break off short and readily melt in the mouth.

#### **Spreads:**

Butter and margarines are used for spreads, and their function is to add to the flavour, nutritional value and stiety value of breads.

#### **Salad Dressings:**

Fat is used for the various salad dressings. The hot animal fat dressings, which consist of bacon fat, vinegar and seasonings are used for green hot salads. Mayonnaise used for dressing salads is an emulsion of oil, acid, egg yolk and seasoning.

#### **Tempering:**

Dishes such as dals, curries are tempered. The fat or oil is heated to which cuminseed or mustard or fenugreek seeds etc is added and poured over the dals and pulses.

### 2.4.3 Rendering of Fat

Animal fat is heated and melted and this renders fat from fatty tissues. Tallow, suet, lard are usually rendered and used for cooking. The fat is cut into small pieces and placed in a pan and put in the oven or on slow fire, until the fat melts, and there are crisp brown pieces of tissues left. This should be strained through a fine cloth into a clean bowl.

#### **2.4.4 Clarification of Fat**

Used fat should be clarified and then used for better results in cooking. Strain the used fat and then mix double the quantity of water, in a pan and bring it to the boil. Strain again, cool and place in a refrigerator. The fat will solidify and float on top. Lift the cake of fat, turn it upside down and scrape off the foreign particles that have collected. Heat the fat on slow fire, till the water evaporates and then strain and store it in a cool place.

### **2.5 SALT**

Salt is a crystalline solid, white, pale pink or light grey in color, normally obtained from sea water or rock deposits. Salt is an essential ingredient for both sweet and savoury dishes. Salt helps to bring out the flavour of other ingredients. If too much is added, food becomes inedible and too little makes food insipid. The right amount to be added is known by experience. It adds to the nutritive value of food by providing the essential mineral, sodium chloride.

Salt has physical effects on the gluten of flour. In reasonable quality it strengthens gluten and increases its resistance to the softening effects of fermentation. Too much salt on the other hand will remove the power of gluten to hold gas. Salt also acts as a preservative; it speeds up coagulation of eggs and lowers the freezing point.

Salt is available in three forms:

1. Table salt (fine) containing phosphate
2. Coarse or freezing salt for culinary purposes
3. Celery salt (used as an alternative to fresh celery or celery seed).

#### **2.5.1 Uses of Salt**

- 1) Salt is essential for good health.
- 2) Salt is used as a preservative and as a seasoning. Salting is one of the oldest popular methods of preserving ham, bacon, fish, etc.
- 3) Use of the correct amount of salt improves the flavour of the savory dished and when a little is added to sweet dished, it enhances the flavour.



- 4) It has a physical effect on the gluten of flour and strengthens gluten and increases its resistance to the softening effects of fermentation.
- 5) Cauliflower, when put in salted water, makes the insects come out.
- 6) It has a controlling effect on the activity of yeast in bakery products. It controls fermentation and hence it has marked effect on crumb, crust and colour of baked products.
- 7) Salt added to water, for cooking green vegetables, helps in colour retention and enhances the taste.

## 2.6 RAISING AGENTS

A raising agent (also called leavening or leaven) is a substance used in doughs and batters that causes a foaming action intended to lighten and soften the finished product.

The function of the raising agent is to puff up the food that it spreads and rises and becomes full of holes, thus making it light and not close and heavy. The holes made by the raising agents are retained during the process of cooking. The leavening of the flour mixture is accomplished by the expansion of water vapour and carbon dioxide. When the product is heated the air expands and part of the water vaporizes. The formation of carbon-dioxide requires the presence of suitable microorganisms or chemical agents. During the first part of heating gas production is accelerated and the gas formed expands as the temperature rises.

The following are the different types of raising agents:

- Biological raising agents
- Chemical raising agents
- Mechanical leavening
- Other leaveners

### 2.6.1 Biological Leaveners

Microorganisms that release carbon dioxide as part of their lifecycle can be used to leaven products. Varieties of yeast are most often used, particularly *Saccharomyces* species (i.e. baker's yeast), though some recipes also rely on certain bacteria. Yeast leaves behind waste byproducts (particularly ethanol and some autolysis products) that contribute to the distinctive flavor of yeast breads. In sourdough breads, the flavor is further enhanced by various lactic or acetic acid bacteria.

Leavening with yeast is a process based on fermentation, physically changing the chemistry of the dough or batter as the yeast works. Unlike chemical leavening, which usually activates as soon as the water combines the acid and base chemicals, yeast leavening requires proofing, which allows the yeast time to reproduce and consume carbohydrates in the flour.

While not as widely used, bacterial fermentation is sometimes used, occasionally providing a drastically changed flavor profile from yeast fermentation; salt rising bread, which uses a culture of the *Clostridium perfringens* bacterium, is a well-known example.

Some typical biological leaveners are:

- beer (unpasteurised - live yeast)
- buttermilk
- ginger beer
- sourdough starter
- yeast
- yogurt

### 2.6.2 Chemical Leaveners

Chemical leaveners are chemical mixtures or compounds that typically release carbon dioxide or other gases when they react with moisture and heat; they are almost always based on a combination of acid (usually a low molecular weight organic acid) and an alkali (though ammonia-based leaveners are also available, though in decreasing quantity). They usually leave behind a chemical salt. Chemical leaveners are used in quick breads and cakes, as well as cookies and numerous other applications where a long biological fermentation is impractical or undesirable.

Since the chemical expertise required to create a functional chemical leaven without leaving behind off-flavors from the chemical precursors involved, such substances are often mixed into premeasured combinations for maximum results. These are generally referred to as baking powders.

Chemical leavening agents include:

- baking powder
- baking soda (sodium bicarbonate)
- ammonium bicarbonate (hartshorn, horn salt, bakers ammonia)
- potassium bicarbonate (potash)
- potassium bitartrate (cream of tartar)
- potassium carbonate (pearlash)
- monocalcium phosphate

### 2.6.3 Mechanical Leavening

Mechanical leavening is the process of incorporating air by whisking, beating and sieving. Creaming is the process of beating sugar crystals and solid fat (typically butter) together in a mixer. This integrates tiny air bubbles into the mixture, since the sugar crystals physically cut through the structure of the fat. Creamed mixtures are usually further leavened by a chemical leavener. This is often used in cookies.

Using a whisk on certain liquids, notably cream or egg whites, can also create foams through mechanical action. This is the method employed in the making of sponge cakes, where an egg protein matrix produced by vigorous whipping provides almost all the structure of the finished product.

#### **2.6.4 Other Leaveners**

Steam and air are used as leavening agents when they expand upon heating. To take advantage of this style of leavening, the baking must be done at high enough temperatures to flash the water to steam, with a batter that is capable of holding the steam in until set.

##### **Air as a Raising Agent:**

Air is incorporated by sifting flour, by creaming shortening, by beating eggs or by beating the mixture itself.

##### **Water Vapour as a Raising Agent:**

Water vapour is formed in quantities sufficient to raise the mixture when liquid and flour are in equal volumes.

## **2.7 LIQUIDS**

Cooking often involves water which is frequently present as other liquids, both added in order to immerse the substances being cooked (typically water, stock or wine), and released from the foods themselves. Liquids are so important to cooking that the name of the cooking method used may be based on how the liquid is combined with the food, as in steaming, simmering, boiling, braising and blanching. Liquid is necessary to bind dry ingredients together, to act as a cooking medium and to thin down a gravy or sauce. Milk, water, stock and fruit-juices are the most commonly used liquids.

### **2.7.1 Water and Milk**

Water and milk are used for preparing poaching liquor, soups, sauces, gravies, cakes and pastry mixtures and kneading of doughs etc. Butter milk is used for curries, kadi, etc.

### **2.7.2 Stock**

Stock is a flavoured liquid. It forms the basis of many dishes, particularly soups and sauces. Stock is prepared by simmering various ingredients in water, including some or all of the following:

- Bones (veal, beef and chicken bones) - The flavour of the stock comes from the cartilage and connective tissue in the bones. Connective tissue has collagen in it, which gets converted into gelatin that thickens the liquid. Stock made from bones needs to be simmered for longer than stock made from meat (often referred to as broth).

- Mirepoix - A combination of onions, carrots, celery, and sometimes other vegetables). Often the less desirable parts of the vegetables (such as carrot skins and celery ends) are used since they will not be eaten.
- Herbs and spices - The herbs and spices used depend on availability and local traditions. In classical cuisine, the use of a bouquet garni (or bundle of herbs) consisting of parsley, bay leaves, a sprig of thyme and possibly other herbs, is common. This is often wrapped in a cheesecloth "bag" and tied with string to make it easier to remove it once the stock is cooked.

## 2.8 FLAVOURINGS AND SEASONINGS

Flavouring and seasoning are the process of adding or improving flavor of food. Flavouring combines taste and smell such as essences, cardomom, nutmeg, thyme etc. Seasonings include herbs, spices, and all other condiments. Example: black pepper, basil, kosher salt, etc.

Spices and herbs give flavouring and seasoning to the dishes. To get effective results, not only should the food, please the eye, but should also flatter or stimulate the palate. The success of cooking largely depends upon the help we obtain from flavoring and seasoning. The spice we use for this purpose should be used sparingly, as well as with skill. All palates may not crave for high spiced food, yet majority of people demand, that the food be moderately flavoured with the right constituents. To use flavouring and seasoning rightly is a great accomplishment; the dish could be spoilt by being overseasoned. Seasoning should bring out the natural flavours of the main ingredients and blend with them. Seasonings as such have little or no nutritive value but are valuable for they give variety to the dishes and have medicine value.

Spices that have flavourings and seasonings are: Garlic ginger, cloves, cinnamon, cardamom, cumin seeds, mustard seeds, poppy seeds, nutmeg, coriander powder, mace, pepper, fenugreek, chillies, saffron, aniseeds, turmeric, paprika, caraway seeds, allspices, sesame. Various herbs are: parsley, celery, coriander leaves, thyme, tarragon, rosemary, mint, marzoram, sage, bay leaf, basil, chervil, caripatta, etc .

### 2.8.1 Important of Spices and Herbs

- (i) **Help in digestion** - From pre-historic times spices have been used. Clove oil stimulates the flow of gastric juices, garlic, aniseeds and asfoetida are taken for indigestion, and hypertension.
- (ii) **Seed for medicinal purposes** – For toothache, clove oil relieves pain. Turmeric and oil applied on swellings and hurts, cures, as it is believe to have antiseptic

qualities. Garlic and saunf helps digestion, ginger added to tea helps to cure colds. Turmeric added to milk is given to a person who is in a state of shock.

- (iii) **Enhance flavour** - Dishes would be inspid and bland if the spices were not added, because they give a good flavour and stimulate appetite. Monosodium Glutamate is a flavour enhancer in meat and fish dishes. Cinnamon, bay leaf, nutmeg, saffron, pepper, cloves etc.
- (iv) **Improve appearance** - Some of the spices give colour to the food and improve the appearance of the dish. Turmeric, saffron, coriander leaves, poppy seeds, raratanjoi add colour to the food, which makes the dish interesting.
- (v) **Improve palatability** - Salt is one of the important seasonings that enhances the taste of the food. It also brings out the flavour. The other seasonings that improve the palatability are pepper, chillies, poppy seed's, coriander seeds and paprika etc.
- (vi) **Act as preservatives** - Many foods are preserved for a longer time with the help of spices. Salt is used extensively for preserving - Brine, solution. Other spices that have the preservative quality are:- turmeric, cloves, mustard, ginger, garlic. Pickling is one of the forms of preserving.

## 2.9 SWEETENINGS

It is the process of adding sweet to the dish. When sweetening is used with other foods it enhances the combined sensations of odour and flavour of the dish produced. It also adds its own sweetness, and is a versatile food product. Its uses in the kitchen are varied. The types of sweetenings used are sugar, jaggery and molasses, syrups, jams, honey and fruit juices. Sweetening is available in various forms: granulated, fine-grained, and powdered and in a solution form.

### 2.9.1 Sugar

Sugar is the naturally occurring nutrient that makes food taste sweet. It is a carbohydrate along with starch. Sugar as a basic food carbohydrate primarily comes from sugar cane and from sugar beet, but also appears in fruit, honey, sorghum, sugar maple (in maple syrup), and from many other sources.

### 2.9.2 Different Types of Sugar

Sugars vary in their sweetening quality and are available in the following form-granulated sugar, castor sugar (finer than granulated and used for baking), icing sugar, preserving sugar (coarser than granulated and used for jams and jellies), and brown sugar (for colour and flavour), lactose (milk sugar) cane syrup, maple syrup, treacle, honey and golden syrup. Substitution of one sugar

(castor, icing) for another in a baking formula, gives allowance for the difference in the sweetening effect.



Figure 2.3 Different Types of Sugar

The most obvious difference between types of sugars used in the home is colour. When sugar has been extracted from the juice of the beet or cane plant, a strong tasting black syrup (known as molasses) remains. When white sugar is made, the molasses are entirely removed, whereas brown sugars retain varying amounts of this natural syrup. The more molasses in brown sugar, the stickier the crystals, the darker the colour and the stronger the flavour. However, the presence of molasses does not change sugar's nutritional value.

### 2.9.3 Uses of Sugar

Sugar is not just a sweetener; it can be used in a number of different ways:

- 1) As a preservative: at the right concentration sugar helps to stop microorganisms growing and so prevents food spoilage. For example, as in jams and other preserves. This is why reduced sugar jams spoil much more quickly than traditional jams.
- 2) It helps to produce subtle changes in flavour. Sugar offsets the acidity and sour flavour in many foods such as mayonnaise, tomato products and tart fruits like gooseberries and grapefruit.
- 3) As a bulking agent: sugar gives the characteristic texture to a variety of foods - including jams, ice cream and cakes.

- 4) To raise the boiling point or lower the freezing point. This is essential in some recipes, for example making ice cream.
- 5) To speed up the process of fermentation (by yeast) in baking. This makes the dough rise, for example, bread and tea-cakes.
- 6) It makes cakes light and open-textured when it is beaten with butter or eggs in a recipe.
- 7) Low concentration of sugar speeds the effectiveness of baker's yeast by providing an immediate, fast cooking source of nourishment for its growth-thus hastening the leavening process.
- 8) The ability of sugar to crystallize, gives a delightful variety in cookery.
- 9) Sugar gives puddings, bread, buns and bread rolls a good flavour and the characteristic golden brown colour, flavour (caramel) and a tender light and even texture.

#### **2.9.4 Liquid Sweeteners**

Liquid sweeteners include various syrups, honey, and molasses. Liquid sweeteners are typically less expensive than dry nutritive sweeteners. The following are some of the liquid sweeteners:

##### **Barley Malt Syrup:**

This tastes a bit like molasses, and it's not as sweet as sugar or honey. It's mostly used to make beer, but it's also used to make breads or other baked goods.

##### **Blackstrap Molasses:**

This has a strong, bitter flavor, and it's not very sweet. It's sometimes used to make chili.

##### **Brown Rice Syrup:**

Health buffs like this because it contains complex sugars, which are absorbed more slowly into the bloodstream. It's about half as sweet as ordinary table sugar.

##### **Coconut Syrup:**

Hawaiians like to pour this syrup on pancakes, but it's also used in several mixed drinks.

##### **Corn Syrup:**

This is a thick, sweet syrup that's popular in America, but hard to find in other countries. Unlike other sweeteners, corn syrup doesn't crystallize and turn grainy when it's cold, so it's



a good choice for frostings, fudge sauces, and candies. Baked goods made with corn syrup are moister and stay fresher longer than those made with sugar.

#### **Dark Corn Syrup (Dark Karo Syrup):**

This corn syrup has a mild molasses flavor, and it's a common ingredient in barbecue sauce, pecan pie.

#### **Orgeat (*pronounced* OR-zhat):**

This sweet almond-flavored syrup is used in many mixed drinks.

#### **Maple Syrup:**

It is made from the sap of sugar maples; maple syrup is a traditional topping for pancakes, waffles, and French toast. It's also used to make candies, frostings, candied yams, meat glazes, and baked beans. Lighter syrups usually have a more delicate flavor.

#### **Simple Syrup (Sugar Syrup):**

This is a mixture of sugar and water that's brought to a boil and simmered for about five minutes so that the sugar dissolves and the mixture becomes syrupy. When it cools, it's used to make mixed drinks, liqueurs, baked goods, sorbets, sauces, and many other things. The thickness of the syrup depends upon the ratio of sugar to water used.

## **2.10 THICKENING AGENTS**

Thickening agents, or thickeners, are substances which, when added to an aqueous mixture, increase its viscosity without substantially modifying its other properties, such as taste. They provide body, increase stability, and improve suspending action. They also improve the nutritive value. Thickening agents are often food additives.

Food thickeners are frequently based on polysaccharides (starches or vegetable gums) or proteins (egg yolks, demi-glaces, or collagen). Common examples are agar, arrowroot, coconut, tamarind, curd, poppy seeds, onion taste, coriander powder, gelatin, katakuri, pectin, rehan, roux, tapioca, guar gum, locust bean gum, and xanthan gum. Flour is often used for thickening gravies, gumbos and stews. It must be cooked in thoroughly to avoid the taint of uncooked flour. Cereal grains (oatmeal, couscous, farina, etc.) are used to thicken soups.

Some of the thickening agents are discussed below:

### **2.10.1 Roux**



Roux (*pronounced* ROO) is a thickener that's made from equal weights of flour and a fat, like butter or meat drippings. It is especially good for thickening rich, hearty stews and gravies. Some popular types of roux are:

- White roux - Melt the butter, add the flour and cook for a few minutes over a low heat while stirring constantly.
- Blond roux - It is made in the same manner as the white roux but it is cooked a little longer. It is finished when the flour has a blond colour.
- Brown roux - It is made in the same manner as the blond roux but it is cooked until the flour has a very distinct light brown colour and nutty aroma.

### **2.10.2 Beurremanie**

Beurremanie (pronounced BARE mahn-YAY) is flour-butter mixture. It is used to correct overly thin sauces at the last minute. To make it, blend equal weights of butter and flour is mixed and knead together. After whisking it into a sauce, it is cooked for no more than a minute or two, since sauces thickened with flour pick up a starchy taste after they've cooked for a few minutes. Beurremanie is mainly used in "a la minute" cookery.

### **2.10.3 Fresh Cream**

Fresh cream is generally used to finish sauces and soups, It has also a slight thickening effect.

### **2.10.4 Egg Yolks**

Egg yolks make wonderful thickeners--imparting both a rich flavor and velvety smooth texture. We need to "temper" them by adding some of the hot liquid to the egg yolks, whisking the mixture together, and then adding it to the sauce.

### **2.10.5 Pectin**

Pectin (pronounced PECK-tin) is a white to light brown powder derived from the cell wall of higher terrestrial plants. It is mainly used in food as a gelling agent in jams and jellies. Some fruits like quinces, gooseberries, tart apples, and sour plums, contain enough natural pectin that they'll thicken all by themselves into preserves. Others, like cherries and some berries, need an extra boost to firm up. Jam recipes for pectin-deficient fruit normally call for liquid or powdered pectin.

### **2.10.6 Liaison (Fresh Cream and Egg Yolks)**

Liaison is a very popular thickening agent in white sauces and cream soups. A Liaison consists usually of 2/3 cream and 1/3 egg yolk (1 dl.cream and 1 egg yolk). The soup or sauce containing liaison is not allowed to boil .

### 2.10.7 Refined Flours and Starches

These are products such as arrowroot, cornflour, fecule etc. They are diluted with water, milk, wine or stock, then stirred into the boiling liquid and allowed to boil for a few minutes. The thickening power of these products is usually stronger than the one of ordinary flour, therefore these products are used in small quantities only.

### 2.10.8 Arrowroot

Arrowroot has a neutral taste and thickens at a lower temperature than corn starch, and hence can be used to thicken delicate egg-based soups and sauces. It also imparts an eye-pleasing glossy look to the sauce. However, care needs to be exercised not to add arrowroot too early during the cooking process, as overheating tends to destroy its thickening property.

## 2.11 EGGS

Bird eggs are a common food and one of the most versatile ingredients used in cooking. Chicken eggs are widely used in many types of dishes, both sweet and savory. Eggs can be pickled, hard-boiled, scrambled, fried and refrigerated. The most common egg used today is the hen's egg, though duck, goose and other fowl are available in some areas.

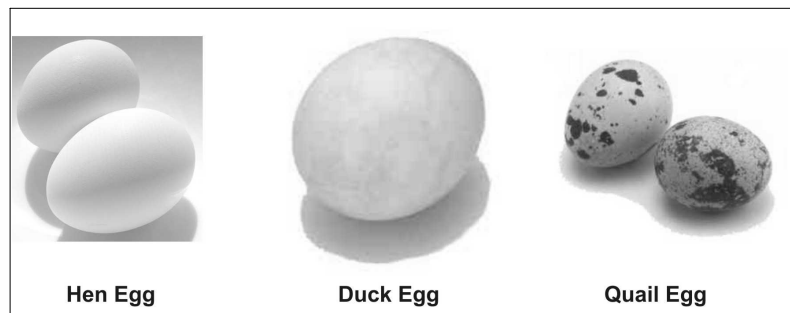


Figure 2.4 Eggs of different birds

The egg white is an excellent source of protein and riboflavin. An egg white (albumin) is fat free and contains only 10 calories. Egg yolks contain all of the fat in an egg and are a good source of protein, iron, vitamins A and D, choline and phosphorus. Egg yolks are high in cholesterol. The color of the yolk depends entirely on the hen's diet. Hens fed on alfalfa, grass and yellow corn lay eggs with lighter yolks than wheat-fed hens. The egg shell's color is determined by the breed and has nothing to do with either taste or nutritive value.

### 2.11.1 Storage of Eggs

- Eggs must always be refrigerated. When stored at room temperature, they lose more quality in 1 day than in a week in the refrigerator.

- Eggs should be stored in the carton in which they came; transferring them to the egg container in the refrigerator door exposes them to odors and damage. They should always be stored large-end-up and should never be placed near odoriferous foods (such as onions) because they easily absorb odors.
- The best flavor and cooking quality will be realized in eggs used within a week. They can, however, be refrigerated up to a month, providing the shells are intact.
- Leftover yolks can be covered with cold water and refrigerated, tightly covered, for up to 3 days. They can be frozen only with the addition of 1/8 teaspoon salt or 1 1/2 teaspoons sugar or corn syrup per 1/4 cup egg yolks.
- Tightly covered egg whites can be refrigerated up to 4 days. They can be frozen as is up to 6 months. An easy way to freeze whites is to place one in each section of an ice cube tray.
- Hard-cooked eggs should be refrigerated no more than a week. Eggs are available in other forms including powdered and frozen (whole or separated). Commercially frozen egg products are generally pasteurized and some contain stabilizing ingredients.

### 2.11.2 Egg Cookery

The basic principle of egg cooking is to use a medium to low temperature and time carefully. When eggs are cooked at too high a temperature or for too long at a low temperature, whites shrink and become tough and rubbery; yolks become tough and their surface may turn gray-green. Eggs, other than hard-cooked, should be cooked until the whites are completely coagulated and the yolks begin to thicken.

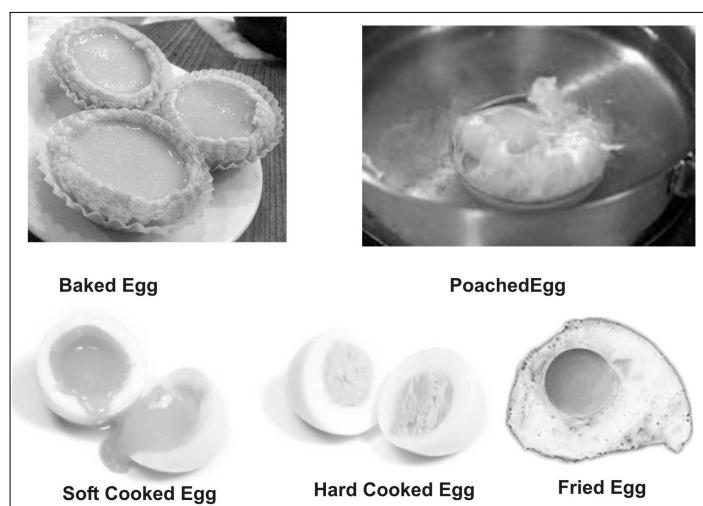


Figure 2.5 Egg Cookery

The following are the basic methods for cooking eggs:

Food Production  
and Patisserie - I

- 1) BAKED (also known as shirred) - For each serving, break and slip 2 eggs into a greased ramekin, shallow baking dish or 10-ounce custard cup. Spoon 1 tablespoon half and half, light cream or milk over eggs. Bake in preheated 325 degrees F. oven until whites are completely set and yolks begin to thicken but are not hard, about 12 to 18 minutes, depending on number of servings being baked.
- 2) COOKED IN THE SHELL - Place eggs in single layer in a saucepan and add enough water to come at least 1 inch above eggs. Cover and quickly bring just to boiling. Turn off heat. If necessary, remove the pan from the burner to prevent further boiling. Let the eggs stand, covered, in the hot water, the proper amount of time.
- 3) HARD-COOKED – Boil the eggs in water for about 15 minutes (for large eggs). Adjust the time up or down by about 3 minutes for each size larger or smaller. To help prevent a dark surface on the yolks, immediately run cold water over the eggs or place them in ice water until completely cooled.
- 4) SOFT-COOKED – Boil the eggs for about 4 to 5 minutes depending on desired doneness. Immediately run cold water over the eggs or place them in ice water until cool enough to handle. To serve out of the shell, break the shell through the middle with a knife. With a teaspoon, scoop the egg out of each shell half into a serving dish.
- 5) FRIED – Egg cooked in a small amount of fat in a pan. In a 7- to 8-inch omelet pan or skillet over medium-high heat, heat 1 to 2 tablespoons butter until just hot enough to sizzle a drop of water. Break and slip 2 eggs into the pan. Immediately reduce the heat to low. Cook slowly until whites are completely set and yolks begin to thicken but are not hard, covering with lid, spooning butter over the eggs to baste them, or turning the eggs to cook both sides.
- 6) STEAM-BASTED VARIATION (a lower-fat version of fried eggs) Use just enough butter to grease a 7" to 8" omelet pan or skillet or substitute a light coating of vegetable pan spray and/or a nonstick pan. Over medium-high heat, heat the butter or the coated pan until just hot enough to sizzle a drop of water. Break and slip the eggs into the pan. Immediately reduce the heat to low. Cook until the edges turn white, about 1 minute. Add about 1 teaspoon water for each 2 eggs. (Decrease the proportion slightly for each additional egg being fried.) Cover the pan tightly to hold in steam. Cook until the whites are completely set and the yolks begin to thicken but are not hard.
- 7) POACHED (eggs cooked out of the shell in hot water, milk, broth or other liquid) In a saucepan or deep omelet pan, bring 1 to 3 inches of water or other liquid to boiling. Reduce the heat to keep the water gently simmering. Break cold eggs, one at a time, into a custard cup or saucer or break several into a bowl. Holding the dish

close to the water's surface, slip the eggs, 1 by 1, into the water. Cook until the whites are completely set and the yolks begin to thicken but are not hard, about 3 to 5 minutes. With a slotted spoon, lift out the eggs. Drain them in a spoon or on paper towels and trim any rough edges, if desired.

- 8) **SCRAMBLED** (yolks and whites beaten together before cooking in a greased pan). For each serving, beat together 2 eggs, 2 tablespoons milk and salt and pepper to taste until blended. In a 7" to 8" omelet pan or skillet over medium heat, heat 2 teaspoons butter until just hot enough to sizzle a drop of water. Pour in the egg mixture. As the mixture begins to set, gently draw an inverted pancake turner completely across the bottom and sides of the pan, forming large soft curds. Continue until the eggs are thickened and no visible liquid egg remains. Do not stir constantly.

### 2.11.3 Uses of Eggs

The eggs are used in various forms while preparing food. They are briefly discussed below:

- 1) **Binding** - A binder helps other ingredients bind together. Eggs are used to help bind together meatballs, meatloaf and flour mixtures. When eggs are heated they *coagulate*, this helps stick together the ingredients they are mixed with.
- 2) **Coating** - The eggs or egg batter help to give a coat to the food items and prevent them from disintegrating and gives them a protective coating. Many of the food items, such as fish fillets, cutlets etc, are dipped into the batter before crumbing and then fried. Eggs are also used for preparing pancake batters (eggs, flour and milk).
- 3) **Leavening** - By beating the egg whites a foam is made up of air bubbles, surrounded by a thin elastic film of egg white. This mixture, when added to products such as sponge cakes, meringues, soufflés etc increases the volume and the egg white film hardens.
- 4) **Emulsifying** – Eggs are the emulsifiers that give a smooth mayonnaise sauce. It is also used as an emulsifier in icecreams, cakes, cream puffs etc.
- 5) **Thickening** – Eggs help to improve the consistency of gravies, curries, sauces and soups. Egg liaisons used in soups and sauces help to thicken and improve the consistency. When used in custards, the heat coagulated the eggs and makes the custard firm.
- 6) **Decoration and Garnishing** – Slices, sieved or quarters of boiled eggs are used to decorate or garnish dishes such as: salads, briyanis, curries, vienna steaks etc.
- 7) **Clarifying** – *Consommés* are clarified with egg whites.

### CHECK YOUR PROGRESS

1. What is smokepoint?  
.....  
.....
2. True or False
  - (i) Fats are soluble in water.
  - (ii) The foundation ingredients must only be a liquid.
  - (iii) Insects come out when cauliflower is put into salted water.
  - (iv) Baking soda is biological leavening agent.
  - (v) Fats with high smokepoint are suitable for frying.
3. Fill in the blanks
  - (i) ..... is a flavoured liquid.
  - (ii) Spices and herbs have more ..... value.
  - (iii) Pickling is one of the form of .....
  - (iv) Thickening agents, when added to our aqueous mixture, increases its .....
  - (v) The flour-butter mixture is called .....
4. Name some of the biological leaveners.  
.....  
.....

### 2.12 LET US SUM UP

The knowledge of cooking materials is necessary to prepare good tasty colourful dishes. The knowledge helps to improve the quality and get standard end product.

Different raw materials are used in cooking to produce a complete dish. Each ingredient in a dish has a special part to play and knowledge of what each food does is necessary to understand cooking thoroughly. The raw materials are foundation ingredient, fats & oils, salt, raising agents, liquids, flavourings and seasonings, sweetenings, thickenings and eggs.

Every dish has a foundation ingredient on which the other ingredients are based. Fats consist of a wide group of compounds that are generally soluble in organic solvents and largely insoluble in water. Salt is an essential ingredient for both sweet and savoury dishes. Salt helps to bring out the flavour of other ingredients. A raising agent is a substance used in doughs and batters that causes a foaming action intended to lighten and soften the finished product.

Liquids are so important to cooking that the name of the cooking method used may be based on how the liquid is combined with the food, as in steaming, simmering, boiling, braising and blanching.

Flavouring and seasoning are the process of adding or improving flavor of food. Sweetenings It is the process of adding sweet to the dish.

Eggs are one of nature's most perfectly balanced foods, containing all the protein, vitamins (except vitamin C) and minerals essential for good health. Eggs can be an important part of an active person's diet. Eggs have been considered the standard against which all other protein foods are measured because their protein composition is so ideal. Eggs are considered a complete protein because they contain all eight essential amino acids, or the "building blocks" of protein.

### 2.13 LESSON END ACTIVITY

1. Visit a grocery shop and make a note of the popular brands of various Raising Agents and sweeteners.
2. Take 200 gms of wheat flour, divide into two portions. Make two doughs one using raising agent of your choice and the other without raising agent. After five hours note the differences in the two doughs before and after cooking.
3. Try any two methods of cooking eggs.

### 2.14 KEY WORDS

<b>Satiety</b>	The condition of being full or gratified beyond the point of satisfaction
<b>Margarine</b>	a spread made chiefly from vegetable oils and used as a substitute for butter
<b>Lard</b>	soft white semisolid fat obtained by rendering the fatty tissue of the hog
<b>Suet</b>	is the fat surrounding the kidneys and loin of an animal. It is used in stuffings, mincemeat and plum pudding.
<b>Saturated fat</b>	A fat, most often of animal origin, that is solid at room temperature and whose fatty acid chains cannot incorporate additional hydrogen atoms. An excess of these fats in the diet is thought to raise the cholesterol level in the bloodstream.
<b>Gluten</b>	The mixture of proteins, including gliadins, found in wheat grains, that are not soluble in water and that give wheat dough its elastic texture.
<b>Coagulation</b>	When eggs are heated the liquid inside thickens. This thickening of the protein is called coagulation.
<b>Consommé</b>	It is a type of stock.



### 2.15 QUESTIONS FOR DISCUSSION

1. What are the uses of fats and oils?
2. What are the uses of sugar?
3. What are raising agents?
4. Briefly explain the various thickening agents used.
5. Explain any five basic methods of cooking egg.

### CHECK YOUR PROGRESS - ANSWER

1. When fats or oils are heated, a temperature is reached at which visible fumes appear which is defined as smoke point.
2. (i) False  
(ii) False  
(iii) True  
(iv) False  
(v) True
3. (i) Stock  
(ii) medicine  
(iii) preserving  
(iv) viscosity  
(v) beurremanie
4. Water, milk, stock and fruit-juice are the most commonly used liquids in cooking.

### 2.16 REFERENCES

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# UNIT II





## LESSON 3

### PREPARATION OF FOOD

#### CONTENTS

3.0	Aims and Objectives
3.1	Introduction
3.2	Preparation of Ingredients
3.3	Combining and Mixing in the Preparation of Foods
3.4	Let us Sum Up
3.5	Lesson End Activity
3.6	Key Words
3.7	Questions for Discussion
3.8	References

#### 3.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Preparation of ingredients
- Combining and mixing in the preparation of foods

#### 3.1 INTRODUCTION

Food preparation has been a constant chore since the first human beings picked up cutting and mashing stones. In return, this effort to make food edible, preserve it, and transform its character has sustained an ever-increasing population. Many techniques, including grinding, sifting, drying, salting, fermenting, sealing and applying heat are extremely ancient. Few fundamentally new techniques have been introduced in the past two centuries, among them microwaving.

The processes of food preparation might be divided according to their primary science, whether physical (such as extracting nuts from their shells), chemical (adding salt or sugar), or biological (brewing beer). Perhaps more logically, they might be categorized according to their intended purpose. Some foods are toxic unless prepared properly. Others are scarcely edible until softened. Preparation can bring together nutritional variety. It can add intriguing flavors. Food preparation can also have negative impacts, especially on nutrients. Therefore care has to be taken throughout the process of cooking right from the preparation of ingredients to final serving.

Many techniques are used for food preparation before cooking and they are done according to the requirements of the various dishes. This helps to improve, appearance texture, palatability and flavour and foods combine readily. The techniques are divided into two:-

- 1) Preparation of ingredients
- 2) Combining and mixing in the preparation of foods

### 3.2 PREPARATION OF INGREDIENTS

Preparation of ingredients is popularly termed as *Mise-en-place*. *Mise-en-place* (pronounced *mizāplas*, is literally "set in place"), it is a French phrase defined by the Culinary Institute of America as "everything in place". It is used in kitchens to refer to the ingredients, such as cuts of meat, relishes, sauces, par-cooked items, spices, freshly chopped vegetables and other components that a cook requires for the menu items that they expect to prepare.

Recipes are reviewed, to check for necessary ingredients and equipment. Ingredients are measured out, washed, chopped and placed in individual bowls. Preparing the *mise en place* ahead of time allows the chef to cook without having to stop and assemble items, which is desirable in recipes with time constraints.

Solid foods which are to be mixed have to be reduced into sizes which will allow them to combine readily. A certain amount of preparation is thus mandatory.

#### **Washing:**

Washing is a form of cleansing food before preparation or eating. Washing is done to remove superficial dirt. Meat, fish, vegetables and fruits are washed in cold water before any preparation, i.e. peeling or cutting. If cut and soaked for a long period or washed after cutting, there is a great loss of water soluble vitamins and minerals. The more cut surfaces exposed the more nutrition is lost. The following are the points to be noted while washing fruits or vegetables:

- Remove and discard outer leaves.
- Rinse under clean, running water just before preparing or eating.
- Rub briskly by scrubbing with a clean brush or hands, to remove dirt and surface microorganisms.
- Don't use soap or detergent.
- After washing, dry with a clean cloth or paper towel. Moisture left on produce may promote survival and growth of microorganisms. Drying is critical if food won't be eaten or cooked right away
- Cut away bruised and damaged areas.

- Bacteria on the outside of fruits can be transferred to the inside when the fruit is peeled or cut. Wash fruits; such as cantaloupe and other melons; under running water.

### **Cutting:**

Cutting or chopping is reducing to small parts using a knife or scissors or chopping knife or a food chopper. Cutting into even sized pieces or cubes is called dicing. Cutting into very fine pieces with a knife is called shredding e.g. finger chips. Slicing is also cutting in thin long pieces by it is not as fine as shredding, e.g. bread slices.

### **Peeling and Scraping:**

Peeling is removing the outermost skin of fruits or vegetables manually or using a peeler, e.g. sweet limes, bananas, boiled potatoes. Spoilt, soiled and edible portions, skins of vegetables like potatoes, carrots etc. and fruits are removed by scraping.

### **Paring:**

Paring is removing the surface layer in circular motion by pressure of a knife-edge all round the object, e.g. paring an apple.

### **Grating:**

Grating is reducing a large piece of food to small particles or thin shreds by rubbing it against a coarse, serrated surface called a grater usually on a kitchen utensil. The food to be grated should be firm, which in the case of cheese can usually be accomplished by refrigeration. Grating food makes it easier to incorporate with other foods.

### **Mincing:**

Mincing is a method in which food ingredients are finely ground. The effect is to create a closely bonded mixture of ingredients and a soft or pasty texture. Flavoring ingredients with spices or condiments such as garlic, ginger, and fresh herbs may be minced to distribute flavor more evenly in a mixture. Additionally bruising of the tissue can release juices and essential oils to deliver flavors uniformly in a sauce. Meat is also minced to make meat balls, stuffings in meat puffs, etc.

### **Slicing:**

Slicing is cutting into thin pieces, but not as fine as shredding.

### **Shredding:**

Shredding is cutting into long narrow pieces by means of a shredder or knife, e.g. cabbage.

### **Slitting:**

Making a slit in the middle lengthwise, e.g. lady's fingers, green chillies, etc.

**Grinding:**

Grinding is reducing to small fragments or powder by crushing, as in grinding spices, or coffee in a flour mill or on a grinding stone.

**Mashing:**

Mashing is a method of breaking up of soft food usually after cooking or boiling with pressure, with a potato masher or with a fork.

**Pressing:**

Pressing is separating liquid portions from solids by weights or mechanical pressure, as in making cider from apples, paneer, screw pressing, etc.

**Puréeing:**

Puréeing is grinding, pressing, and/or straining vegetables or legumes to the consistency of a soft paste or thick liquid. Purées of specific foods are often known by specific names, e.g. mashed potatoes or apple sauce. Fruit juice concentrates are also made in the form of semi-solid puree, e.g. guava, tomato puree, etc.

**Sieving:**

Sieving separates wanted/desired elements from unwanted material using a tool such as a mesh or net. It also helps in enclosing air between powder particles and mixing ingredients evenly, like sieving of flour for cakes. It also ensures uniformity of particle size.

**Refining:**

Refining is freeing desired material from impurities, as in refining cane-sugar.

**Skimming:**

Skimming is removing a floating layer by passing a utensil under it (ladle) as in skimming cream from milk.

**Rendering:**

Rendering is separating fat from connective tissues by heat as in rendering lard (dripping).

**Filtration:**

Separating solids or sediments from liquids, through fine meshed materials, as in filtering fruit juices for jelly through a cloth bag or fine wire mesh strainer or filter press.

### **Flavouring:**

A bundle of herbs and vegetables *bouquet garni* to impart flavour to stock and sauces.

### **Julienning:**

Julienning is a method of food preparation in which the food item is cut into long thin strips. Common items to be julienned are carrots for carrots Julienne, potatoes for French fries, or celery for Céléris Remoulade. Julienne can also be applied to the preparation of meat or fish, Japanese *saseme* especially in stir fry techniques.

### **Sprouting:**

Sprouting is the practice of soaking, draining and then moistening seeds at regular intervals until they germinate, or sprout.

### **Flotation:**

Separating on the basis of difference in specific gravity as in the elimination of the over immature peas in a batch by use of brine of appropriate strength.

### **Evaporation or Reduction:**

Evaporation or reduction is removal of water, commonly accelerated by heating without lid.

### **Homogenization:**

Sub-dividing large drops into smaller ones by forcing them through a small aperture under great pressure as in homogenizing the fat in cream, homogenized milk etc.

### **Emulsification:**

Dispersing one liquid in another in which it is insoluble or unmiscible such as water and oil with the addition of an emulsifier; e.g. vegetable gums. If the dispersion is to be temporary, a stabilizer, which coats the droplets of the dispersed phase, must be incorporated, e.g. in mayonnaise.

## **3.3 COMBINING AND MIXING IN THE PREPARATION OF FOODS**

Food preparation often involves the combining and mixing of different food or food materials. Important effects of the methods of combining food or ingredients are those related to palatability.



Texture and flavour are often controlled to an important degree by the skill and method employed in combining component materials.

### **Beating:**

Beating is mixing materials briskly, lifting and dropping them with an appropriate tool. Whether done using an electric mixer or by hand with a fork, spoon, or whisk, to 'beat' is to vigorously mix, blend, or stir a mixture in a circular motion. This technique changes the consistency of the ingredient(s), from the smoothing, mixing and aerating the ingredients to incorporating air into egg whites or sweet cream. Rule of Thumb - 100 strokes by hand will equal about one minute with an electric mixer.

### **Blending:**

Blending is a technique where two or more ingredients are combined so they are smooth and equally distributed throughout the mixture. A spoon, fork, rubber spatula, whisk, electric mixer with paddle attachment, food processor, blender or even bare hands can be used for this technique. Blending differs from beating in that its sole purpose is to combine the ingredients, not to incorporate air into the mixture.

### **Cutting-in:**

Cutting-in is a technique used in pastry making (scones, biscuits) involving the mixing of a cold solid fat (butter, margarine, shortening) into dry ingredients (flour mixture) until the mixture is blended but still contains small flour-coated pieces of cold fat. This combining of the cold fat and dry ingredients must be done quickly and with a light hand so that the fat does not melt. For light and fluffy scones or biscuits, the fat should not become too soft or cut too fine. A pastry blender, two knives, fingers, food processor or an electric mixer with the paddle attachment can be used.

### **Creaming:**

Creaming is mixing or beating technique that combines ingredients to make a uniform mixture and also incorporates air into this mixture. Softening fat by friction with a spoon, usually followed by gradual incorporation of sugar as in cake-making. The butter should be at room temperature so it incorporates the sugar sufficiently to produce a smooth and creamy batter that is light and fluffy. A whisk, wooden spoon, or electric mixer with paddle attachment can be used.

### **Kneading** (pronounced (NEEDing):

Kneading technique used in both bread making and pastries to combine and work a dough or mixture into a smooth and pliable mass. In bread making, kneading the dough also develops the gluten strands in the flour so it adequately holds in the gases released by the leavener (yeast) to produce a bread with good volume and texture. This technique can be done by hand, using the press-fold-

turn action or using a food processor or electric mixer with the dough hook.

Preparation of Food

### **Whipping:**

Whipping is a mixing technique used to incorporate air into an ingredient or mixture (i.e. egg whites, heavy cream) to increase its volume and make it light and fluffy. This is done by vigorously beating in a circular motion using a wire whisk or electric mixer. Egg whites are often whipped and then added to cake batters to make them less dense so they have more volume when baked. Whipped heavy cream can be added to custards or sauces to make them lighter.

### **Whisking:**

Whisking is a technique to rapidly beat or whip as much air (volume) as possible into a mixture or one ingredient (usually heavy cream or egg whites). This is accomplished by using a wire whisk or electric mixer. A whisk is made of several wires that are looped together into a teardrop shape and attached to a wooden or stainless steel handle. They come in many different sizes and shapes with the wires of various amounts, thicknesses and flexibilities. Whisks can be used to whip, blend or stir ingredient(s).

### **Folding:**

Folding is a simple but crucial technique used when combining a light and airy ingredient into a heavier ingredient or mixture in such a way as each ingredient maintains its original volume. This technique must be done quickly but gently and stop 'folding' as soon as the ingredients are blended. Start by placing one quarter of the lighter mixture on top of the heavier mixture. With a rubber spatula cut down vertically through the two mixtures, sweep across the bottom, up the nearest side of the bowl, and over the top of the mixtures (go in clockwise direction). Rotate the bowl a quarter turn counter-clockwise and repeat the down-across-up-over motion. This technique is commonly used to incorporate flour into a sponge cake base and adding egg whites to a cake batter.

### **Marinating:**

Marinating is the process of soaking foods in a seasoned, often acidic and / or liquid before cooking. The 'marinade' can be acidic with ingredients such as vinegar, lemon juice, or wine, or savory with soy sauce, brine or other prepared sauces. Along with these liquids, a marinade often contains oils, herbs, and spices to further flavor the food items.

It is commonly used to flavor foods and to tenderize tougher cuts of meat or harder vegetables such as beetroot, eggplant and courgette. The process may last seconds or days. Different marinades are used in different cuisines. In Indian cuisine the marinade is usually prepared with yoghurt and spices.

### Sealing:

Sealing is the sauteing or pre-cooking roast, to develop colour and flavour.

### Stirring:

Stirring is mixing materials with an appropriate tool, such as a spoon by a circular motion in contact with the pan (as in stirring white sauce). Generally this is a gentle movement but changed to suit different dishes, as when used to prevent sticking or burning in halwas and toffees. If used too vigorously, it is likely to drive out any air or other gas previously enclosed as a raising agent.

## CHECK YOUR PROGRESS

### 1. Fill in the blanks

- (i) Cutting into even sized pieces or cubes is called .....
- (ii) ..... is removing the outermost skin of fruits or vegetables.
- (iii) ..... is reducing large piece of food to small particles or thin shreds.
- (iv) ..... is cutting of fruits and vegetables into long narrow pieces.
- (v) ..... is reducing to small fragments by crushing.
- (vi) ..... separates wanted components from unwanted materials using a tool such as mesh net.
- (vii) ..... is mixing of air with ingredients for softening.
- (viii) ..... is the process of soaking foods in a seasoned liquid before cooking.

### 2. True or False

- (i) Cutting into very fine pieces with a knife is called shredding.
- (ii) Use soap or detergent to wash fruits and vegetables.
- (iii) Mincing is a method in which food ingredients are finely divided.
- (iv) Apple sauce is made by puréeing apple.
- (v) Skimming is a method through which unwanted constituents are removed from milk by heating.
- (vi) Sprouting is the practice of soaking, draining followed by keeping seeds moist until the seeds germinate.
- (vii) Kneading is a technique used in pastry making.
- (viii) Marinade is used to flavour foods and to tenderize tougher cuts of meat or harder vegetables.

## 3.4 LET US SUM UP

Many techniques are used for food preparation before cooking and they are done according to the requirements of the

various dishes. This helps to improve, appearance texture, palatability and flavour and foods combine readily. The techniques are preparation of ingredients and combining and mixing in the preparation of foods.

Solid foods which are to be mixed have to be reduced into sizes which will allow them to combine readily. A certain amount of preparation is thus mandatory. The preparation methods include washing, cutting, peeling and scraping, paring, grating, mincing, slicing, shredding, slitting, grinding, mashing, pressing, pureeing, sieving, refining, skimming, rendering, filtration, flavouring, julienning, sprouting, flotation, evaporation or reduction, homogenization and emulsification are discussed briefly.

Food preparation often involves the combining and mixing of different food or food materials. The combining and mixing methods such as beating, blending, cut or cutting-in, creaming, kneading, whipping, whisking, folding, marinating, sealing and stirring are discussed briefly.

### 3.5 LESSON END ACTIVITY

- 1) Try cutting, peeling, slicing, grating and shredding vegetables of your choice.
- 2) Take two eggs in two different bowls. Try whisking in one bowl and whipping in the other. Note the differences in the egg consistency.

### 3.6 KEY WORDS

<b>Bruise</b>	to partially crush an ingredient in order to release its flavor. Bruising a garlic clove with the flat side of a knife crushes without cutting it.
<b>Brine</b>	A strong solution of water and salt used for pickling or preserving foods. A sweetener such as sugar or molasses is sometimes added to brine to make it taste salty and sweet at the same time.
<b>Aerating</b>	incorporates air to make ingredients (such as confectioners' sugar or flour) lighter and fluffy.
<b>Spatula</b>	A flattish, rather narrow kitchen utensil that comes in a variety of shapes and sizes. Depending on the material from which it's made (which includes wood, metal, rubber and plastic), spatulas can be used for a plethora of kitchen tasks.
<b>Bouquet Garni</b>	A bunch of herbs (the classic trio being parsley, thyme and bay leaf) that are either tied together or placed in a cheesecloth bag and used to flavor soups, stews and broths. This technique helps in the easy removal of the leaves used after extraction of flavours.

### 3.7 QUESTIONS FOR DISCUSSION

Food Production  
and Patisserie - I

- 1) What are the points that need to be noted while washing fruits or vegetables?
- 2) Explain:
  - (i) Grating
  - (ii) Mincing
  - (iii) Mashing
  - (iv) Juliennening
  - (v) Homogenisation
- 3) Give a brief description about kneading and marinating.
- 4) What is the difference between whipping and whisking?
- 5) Differentiate peeling and scraping.

### CHECK YOUR PROGRESS - ANSWER

1.
  - (i) dicing
  - (ii) Peeling.
  - (iii) Grating
  - (iv) Shredding
  - (v) Grinding
  - (vi) Sieving
  - (vii) Creaming
  - (viii) Marinating
2.
  - (i) True
  - (ii) False
  - (iii) True
  - (iv) True
  - (v) False
  - (vi) True
  - (vii) False
  - (viii) True

### 3.8 REFERENCES

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## LESSON 4

### METHODS OF COOKING FOOD

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- 4.0 Aims and Objectives
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- 4.10 Key Words
- 4.11 Questions for Discussion
- 4.12 References

#### 4.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Principles of cooking food
- Moist-heat methods
- Dry-heat methods
- Microwave cooking
- Solar cooking

## 4.1 INTRODUCTION

To ensure desired texture, taste, flavor and quality of cooked food, choosing correct method of cooking is very important. The characteristics desired in the finished product determine which method of cookery will have to be chosen for any given food. While correct preparation of ingredients and correct mixing are necessary, greater skill is needed in the actual cooking of the food.

## 4.2 THE PRINCIPLES OF COOKING FOOD

The cooking of food involves heating it in a variety of ways to make it more palatable. The heat to cook the food comes from a variety of sources, including electric elements or hotplates; gas flame from a stove or barbecue; the heat from a conventional oven; and heat generated by a microwave oven.

Heat is transferred to the food and cooking medium (the fat, water, stock or milk) by means of convection, conduction and radiation. It must be remembered that most foods are cooked by a combination of at least two of the processes of transferring heat, not just one. For example, a baked butter cake will be cooked by heat directly reflecting from the oven walls (radiation), heat circulating in the air of the oven (convection), and heat transferred from the cake pan to the cake mixture (conduction). The three methods of heat transference are:

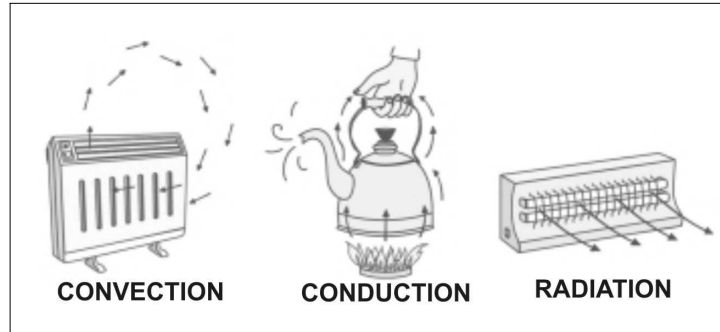


Figure 4.1 Principles of Cooking Food

### Convection:

When food is cooked through the convection process, the heat passes through another medium—either liquid or gas. When liquids or gases are heated, the heat is distributed throughout the cooking medium and food by convection currents. For example, in baking, the air in the oven gradually heats up until the heat is transferred to the product being baked. When food is boiled, the water (the cooking medium) is gradually heated by the process of convection. Once the water is heated, it transfers the heat to the food. The same principle applies to deep frying, except that oil is the cooking medium.

Cooking equipment that uses the process of convection to cook food includes deep fryers, stockpots, steamers, boilers, poachers, cooking pots and ovens. Methods of cooking by convection include poaching, boiling, stewing, braising, baking and roasting.

### **Conduction:**

Conduction is the process in which heat is transferred to the food by direct contact with the cooking vessel (e.g., pot, pan, barbecue, hotplate). The heat passes through a solid or from one solid to another. For food to be cooked by conduction, it must be in direct contact with a heated item. This process relies on the use of good conductors, which allow the heat to transfer through them to the food. Metals are generally good conductors of heat, which is why the cooking equipment in a commercial kitchen is mostly metallic.

Cooking equipment that uses the process of conduction to cook food includes bratt pans, barbecues, woks, crêpe pans, solid grill plates and stove hotplates. Methods of cooking by conduction include stir frying, shallow frying and sautéing.

### **Radiation:**

Radiation is the process of heat transference directly onto the food being cooked. The heat is transferred by electromagnetic waves, such as microwaves and infrared waves. These waves go directly to the food being cooked, and any object in the path of the rays will also become hot, such as a grill plate. When food is microwaved, the cooking process is due to the action of electromagnetic waves produced from the magnetron in the microwave oven. Infrared waves are produced from the grill. These waves cause the food, which is located close to the heat source, to first heat then cook the food.

Cooking equipment that uses the process of radiation to cook food includes microwaves, salamanders, grillers and toasters. Methods of cooking by radiation include grilling, toasting, baking and microwaving. Moist heat or dry heat can be used to cook food in this way. The decision of which cooking method to choose depends on the desired end result of the cooked product. For example, a boneless chicken breast fillet will taste and appear very different if it is poached in chicken stock, rather than being char-grilled, or crumbed and shallow fried.



### 4.3 METHODS OF COOKING FOOD

Different cooking methods are suited to different kinds of foods. For example some meats are high in connective tissue and will be tough unless the tissue is broken down slowly by moist heat. There are many other factors to consider when choosing cooking methods for meats, fish and vegetables such as the flavor and appearance imparted by browning, the flavor imparted by fats, and firmness or delicacy of the product. The basic cooking methods are explained in detail. Cooking methods are mainly classified as:

- (i) Moist heat methods and
- (ii) Dry heat methods.

The other cooking methods such as microwave cooking and solar cooking are also briefly explained.

### 4.4 MOIST- HEAT METHODS

Moist-heat methods of cooking use a liquid cooking medium, usually stock, water, milk or fruit juice. The liquid cooking medium transfers the heat to the food, and cooks the food by convection. Methods of cooking with moist heat include boiling, poaching, steaming, braising and stewing. In this method heat is conducted to the food product by water (including stock, sauces, etc.) or by steam. The following are the moist heat methods:

#### 4.4.1 Boiling

Boiling is cooking food in boiling water, or other water-based liquids such as stock or milk. The boiling point is defined as the temperature at which the vapor pressure of the substance equals the pressure above the substance. Increasing the pressure as in a pressure cooker raises the temperature of the contents above the open air boiling point.



Figure 4.1 Boiling of Vegetables

Adding a water soluble substance, such as salt or sugar also increases the boiling point. This is called boiling-point elevation. However, when these are used in small quantities to improve taste and palatability in small quantities, the effect is very small, and the

boiling point will be increased by an insignificant amount. On the other hand, high concentration of salt or ethylene glycol can cause significant freezing point depression. Due to variations in composition and pressure, the boiling point of water is almost never exceeds 212°F / 100°C, but rather close enough for cooking. No matter how high the burner is turned, the temperature of the liquid will go no higher. Boiling is generally used for certain vegetables and starches. The high temperatures toughen the proteins of meat, fish and eggs and the rapid bubbling breaks up delicate foods.

Foods suitable for boiling include: Fish, Vegetables, Farinaceous foods such as pasta, Eggs, Meats, Sauces, Stocks and soups. Boiling can be done in two ways: The food can be placed into already rapidly boiling water and left to cook. The heat can be turned down and the food can be simmered; or the food can also be placed into the pot, and cold water may be added to the pot. This may then be boiled until the food is satisfactorily cooked.

Water on the outside of a pot, i.e. a wet pot, actually increases the time it takes for the pot of water to boil. The pot will heat at a normal rate once all excess water on the outside of the pot evaporates.

#### **Advantages of Boiling:**

- (i) Older, tougher, cheaper cuts of meat and poultry can be made digestible.
- (ii) It is appropriate for large-scale cookery.
- (iii) Nutritious, well flavoured stock is produced.
- (iv) It is safe and simple.
- (v) Maximum color and nutritive value is retained when cooking green vegetables, provided boiling time is kept to the minimum.

#### **Disadvantages of Boiling:**

- (i) There is a loss of soluble vitamins in the water.
- (ii) Boiling water with the lid on wears out the pot.
- (iii) It can be a slow method.
- (iv) Foods may look unattractive.

#### **4.4.2 Simmering**

Simmering is a cooking technique in which foods are cooked in hot liquids kept at or just barely below the boiling point of water (at average sea level air pressure), 100°C (212°F). To keep a pot simmering, one brings it to a boil and then adjusts the heat downward until just before the formation of steam bubbles stops completely. Water normally begins to simmer at about 94°C or 200°F. Simmering ensures gentler treatment than boiling to prevent

food from toughening and/or breaking up. Simmering is usually a rapid and efficient method of cooking.

#### 4.4.3 Poaching

Poaching is the process of gently simmering food in liquid, generally water, stock or wine. Poaching is particularly suitable for fragile food, such as eggs, poultry, fish and fruit, which might easily fall apart or dry out. For this reason, it is important to keep the heat low and to keep the poaching time to a bare minimum, which will also preserve the flavour of the food.

The poaching liquid is called *court bouillon* and a classical *court bouillon* consists of: an acid (wine, lemon juice), aromatic (*bouquet garni*), poaching liquid, and *mirepoix*. The temperature of the liquid should be around 160-185°F (70-85°C). Always remember that to serve chicken safely, it has to have reached a temperature of 165°F (74°C) in the core.



Figure 4.2 Poaching of Chicken

Poached eggs are generally cooked in water, fish in white wine, poultry in stock and fruit in red wine. When poaching eggs a little vinegar and salt are added to liquid to help in quicker coagulation and thus prevent tissue disintegration.

#### Advantages of Poaching:

- (i) No special equipment is needed.
- (ii) Quick method of cooking and therefore saves fuel.
- (iii) Poached foods are easily digested since no fat is added.

#### Disadvantages of Poaching:

- (i) Poached foods may not appeal to everybody as they are bland in taste.
- (ii) Food can be scorched if water evaporates due to careless monitoring.
- (iii) Water soluble nutrients may be leached into the water.

#### 4.4.4 Blanching

Blanching is a process of food preparation wherein the food substance, usually a vegetable or fruit, is plunged into boiling water, removed after a brief, timed interval and finally plunged into iced water or placed under cold running water (shocked) to halt the continuing cooking process.



Figure 4.3 Blanching

There are two ways of blanching in water:

- Place the item in cold water, bring to a boil and simmer briefly, Cool the item by plunging into cold water. The idea is to dissolve out blood, salt, and impurities from certain meats and bones.
- Place the item in rapidly boiling water and return the water to the boil. Remove and cool in cold water. The purpose is to preserve the color and destroy harmful enzymes in vegetables, or to loosen skins of tomatoes, peaches and similar item for easier peeling.

Blanching can also be described as deep frying in oil at a lower temperature as with the initial cooking of chips. Blanching also weakens the structure of vegetables rendering them softer than fresh. This is beneficial as a pre-treatment for canning vegetables where the air in vegetables needs to be minimal.

#### Uses of Blanching:

- (i) Blanching loosens the skin on some fruits or nuts, such as onions, tomatoes, plums, peaches, or almonds.
- (ii) Blanching enhances the flavor of some vegetables, such as broccoli by releasing bitter acids stored in the cellular structure of the food.
- (iii) Blanching enhances the color of some (particularly green) vegetables by releasing gases trapped in the cellular material that obscure the greenness of the chlorophyll. Since blanching is done - and halted quickly, the heat does not have time to break down chlorophyll as well.

- (iv) Blanching kills off bacteria and enzymes present in foods, thus delaying spoilage. This is often done as a preparatory step for freezing and refrigerating vegetables.

#### 4.4.5 Steaming

Steaming is a method of cooking using steam. Food is cooked in the steam produced by a boiling liquid (rather than placing the food itself in the boiling liquid). Steaming relies on the steam produced being under pressure. The amount of pressure produced is determined by the type of equipment used.

It is a preferred cooking method for health conscious individuals because no cooking oil is needed, thus resulting in a lower fat content. Steaming also results in a more nutritious food than boiling because fewer nutrients are destroyed or leached away into the water (which is usually discarded). It is also easier to avoid burning food when steaming.

Advantages of Steaming are:

- Steaming is mostly used for vegetables. It cooks them rapidly without mixing and minimizes the dissolving away of nutrients occurs when vegetables are boiled.
- Steamed food is easily digested; steaming retains most of the nutrients and flavor. While steaming pour enough water and have the water boiling, if the water is evaporating add only, boiling water to replenish.

There are two different types of steaming: atmospheric steaming and high-pressure steaming, discussed in detail below.

##### 4.4.5.1 Atmospheric Steaming

With atmospheric steaming, steam may be produced by placing water in the bottom of a saucepan and bringing it to a rapid boil. Food is kept in cooking vessels placed above the boiling water. The steam from the boiling water heats the vessel, and thus the enclosed food.

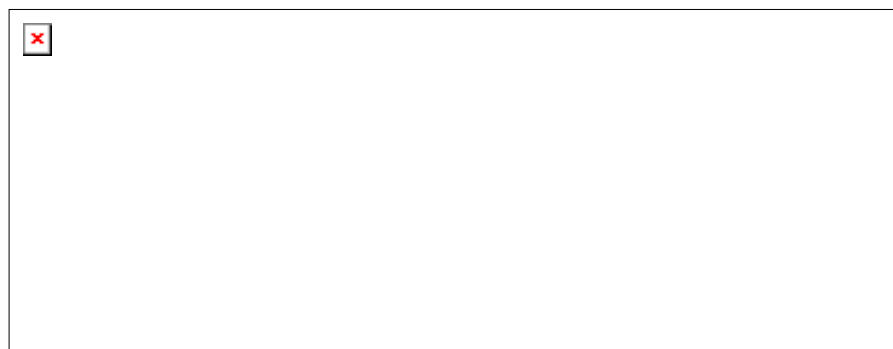


Figure 4.4 Steaming Utensils

Steaming works by first boiling water, causing it to evaporate into steam; the steam then carries heat to the food, thus cooking the food. Such cooking is most often done by placing the food into a steamer, which is typically a circular container made of metal or bamboo. The steamer usually has a lid that is placed on the top of the container during cooking, to allow the steam to cook the food.

Steam at normal pressure is 100°C it is same as boiling water. But it carries much more heat than boiling water and cooks very rapidly. Cooking times must be carefully controlled to avoid overcooking.

The following foods are more suitable for atmospheric steaming are vegetables, except green vegetables, which discolour to an olive-green colour; very tender cuts of meat, such as sirloin or fillet; most types of seafood, either whole or in pieces; poultry, whole or in smaller cuts; dried fruit (fresh fruits are not suitable, as they will deteriorate); puddings, such as sponge puddings or Christmas puddings; and dumplings.

#### 4.4.5.2 High-Pressure Steaming

Steaming can also be carried out in high-pressure steamers, such as pressure cookers. These steamers work on the principle that higher pressure will produce higher temperatures, causing the food to cook faster. In this method the temperature of boiling water can be raised above 100°C. Rice, dhal, meat, roots and tubers are usually pressure cooked.

Steam enters the cooking chamber and builds up pressure. A safety valve is used to control the amount of pressure that builds up. The highest pressure that the unit is allowed to go to is predetermined and preset.



Figure 4. High Pressure Cooker

Foods suitable for steaming are those that can withstand quite high temperatures, as the temperatures created by steam are higher than boiling point. These foods need to be able to withstand a deterioration of colour, flavour and texture. Steaming is a nutritional method of cooking. It is especially useful for foods that contain the water-soluble vitamins B and C, as a large proportion of these vitamins are retained by this process.

Foods suitable for high-pressure steaming include vegetables; tougher cuts of meat; offal such as tongue and oxtail; and poultry (broilers).

**Advantages of Pressure Cooking:**

- (i) Cooking time is less compared to other methods.
- (ii) Nutrient and flavour loss is minimised.
- (iii) Conserves fuel and time as different items can be cooked at the same time.
- (iv) Less chance for burning and scorching.
- (v) Constant attention is not necessary.

**Disadvantages of Pressure Cooking:**

- (i) The initial investment may not be affordable to everybody.
- (ii) Knowledge of the usage, care and maintenance of cooker is required to prevent accidents.
- (iii) Careful watch on the cooking time is required to prevent over cooking.

**4.4.6 Braising**

Braising (from the French “*braiser*”) is to cook covered in a small amount of liquid, usually after preliminary browning. The meat is usually browned first using a dry-heat method such as pan-frying. A desirable taste and flavor can be obtained to the product and the sauce.



Figure 4.5 Braised Cabbage

Braising also refers to cooking some vegetables such as cabbage at low temperature in a small amount of liquid, without first browning in fat, or with only a light preliminary sautéing.

Foods being braised are not completely covered by the cooking liquid. The top of the product is actually cooked by the steam held in the covered pot. Pot roasts, for example are cooked in liquid that covers the item by one third to two thirds. The exact



amount depends on how much sauce is needed for service. This method yields a flavorful, concentrated sauce.

In preparations with poultry and fish no liquid is added. This is still considered braising, since steam is trapped by the cover and the item cooks in its own moisture. Braising may be done on the cooking range or in the oven.

Familiar braised dishes include pot roast, beef stew, Swiss steak, chicken cacciatore, goulash, carbonade, braised tilapia and beef bourguignon, among others. Braising is also used extensively in the cuisines of Asia, particularly Chinese cuisine.

Braising in the oven has three major advantages:

- Uniform cooking. The heat strikes the braising pot on all sides not just the bottom.
- Less attention is required. Foods braise at a low, steady temperature without having to be checked constantly.
- Range space is free for other purposes.

## 4.5 DRY-HEAT METHODS

Dry-heat methods are those in which the heat is conducted without moisture that is by hot air, hot metal radiation or hot fat. This type of cooking happens under a broiler, on a grill, in an oven, or in a deep-fryer, wok, skillet, or sauté pan on the top stove. These methods serve to caramelize both natural and added sugars in food as it cooks, resulting in great flavour, texture and appearance. Generally foods prepared using dry-heat methods have a crusty surface and call for a minimum of additional liquid.

The dry heat methods are further divided into two categories:

- (i) Dry-heat without fat and
- (ii) Dry-heat with fat.

### 4.5.1 Dry-Heat Without Fat

#### 4.5.1.1 Roasting

Roasting is a cooking method that utilizes dry heat, whether an open flame, oven, or other heat source. Roasting usually causes caramelization of the surface of the food, which is considered a flavour enhancement. Meats and most root and bulb vegetables can be roasted. Any piece of meat, especially red meat that has been cooked in this fashion is called a roast. Also, meats and vegetables prepared in this way are described as "roast", e.g., roast chicken or roast squash. Some foods such as coffee and chocolate are always roasted.



Roasting originally meant turning meat or a bird on a spit in front of a fire. It is one of the oldest forms of cooking known.



Figure 4.6 Roasting in Middleages

Traditionally recognized roasting methods consist only of baking and cooking over or near an open fire. Grilling is normally not technically a roast, since grilled meat is usually seasoned with wet ingredients or marinated. Smoking differs from roasting because of the lower temperature and controlled smoke application.

There are four types of roasting: spit roasting, oven roasting, pot roasting and pan roasting.

#### **Pit Roasting:**

The food is brought in contact with direct flame. The food is braised with fat and is also turned regularly to ensure even cooking and browning e.g. barbecued meat.

#### **Oven Roasting:**

Cooking food in an oven with the aid of fat. The food is placed in a fairly hot oven for 5 to 10 minutes. Cooking at a moderate for a longer time temperature produces a better product than cooking in high temperature for shorter period. Meat, poultry and vegetables are cooked by this method.

For roasting the food may be placed on a rack, in a roasting pan or, to ensure even application of heat, may be rotated on a spit or rotisserie. During oven roasting hot air circulates around the meat, cooking all sides evenly. There are several theories for roasting meats correctly: low temperature cooking, high temperature cooking and a combination of both. During roasting, meats and vegetables

are usually basted on the surface with butter, lard or oil to reduce the loss of moisture by evaporation. Recently, plastic oven bags have become popular for roasts.

### **Pot Roasting:**

In thick heavy pan, enough fat is added and when fat is hot the meat joint is browned. It is then lifted out and 2 or 3 skewers are put into the pan, on which the joint is placed. The joint should touch the fat. The pan is covered tightly with a lid and cooked on a slow fire. The joint can be basted occasionally with fat. Meat joints, potatoes and other root vegetables can be cooked by this method.

### **Pan Roasting:**

Pan is heated and grains are added, occasionally stirring. Little fat, or sand is added to prevent burning. Roasting enhances the flavor. Corn is made into popcorn by pan roasting method. Coffee seeds are roasted before being powdered.

### **4.5.1.2 Baking**

Baking is the technique of prolonged cooking of food by dry heat acting by conduction, and not by radiation, normally in an oven, but also in hot ashes, or on hot stones. It is primarily used for the preparation of bread, cakes, pastries and pies, tarts, and quiches. Such items are sometimes referred to as "baked goods," and are sold at a bakery.

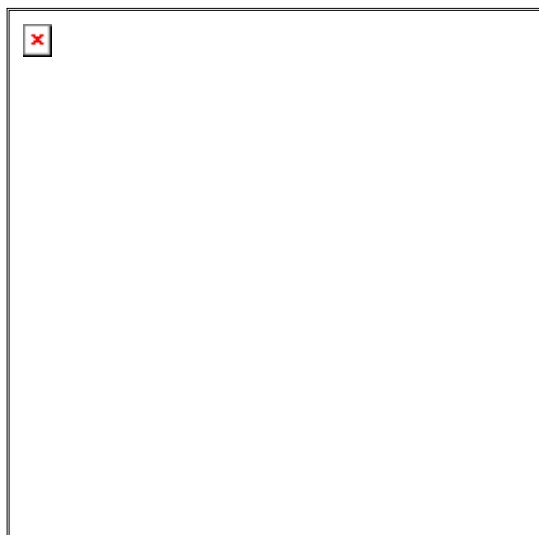


Figure 4.8 Baked Food Items

A person who prepares baked goods as a profession is called a baker. It is also used for the preparation of baked potatoes; baked apples; baked beans; some pasta dishes,

such as lasagne; and various other foods, such as the *pretzel*.

Many domestic ovens are provided with two heating elements: one for baking, using convection and conduction to heat the food; and one for broiling or grilling, heating mainly by radiation. Meat may be baked, but is more often roasted, a similar process, using higher temperatures and shorter cooking times.

The baking process does not add any fat to the product, and producers of snack products such as potato chips are also beginning to substitute the process of deep-frying by baking in order to reduce the fat content of their products.

#### **Advantages of Baking:**

- (i) Baking lends a unique baked flavour to foods.
- (ii) Foods become light and fluffy – cakes, custards, bread.
- (iii) Certain foods can be prepared only by this method – bread, cakes.
- (iv) Uniform and bulk cooking can be achieved. Eg. bun, bread.
- (v) Flavour and texture are improved.
- (vi) Variety of dishes can be made.

#### **Disadvantages of Baking:**

- (i) Special equipment like oven is required.
- (ii) Baking skills are necessary to obtain a product with ideal texture, flavour and colour characteristics.
- (iii) Careful monitoring needed to prevent scorching.

#### **4.5.1.3 Grilling**

Grilling is cooking by dry heat. The food is placed on a grid iron over the fire or on a grid placed in a tin under a gas or electric grill or between electrically heated grill bars.

**Grilling over the Heat** - Food is placed on greased grill bars and cooked on direct flame. The grill bars are brushed with oil to prevent food sticking and can be heated by charcoal, coke, gas or electricity. The bars should clear the article on both sides to give the distinctive flavor of grilling. Meat, poultry and fish can be prepared by this method.



Figure 4.9 Chicken Grilled over the Heat

**Grilling under the Heat** - Salamander, cooking on grill bars or on trays under direct heat. Steaks, chops etc. are cooked on the bars but fish, tomato, bacon, and mushroom are generally cooked on trays.



Figure 4.10 Electric Griller

**Grilling between heat** - Food is cooked between electrically heated grill bars.

**Infra-red grilling** - Cooking food by infra-red radiation. By this method cooking time is considerably reduced.



Figure 4.11 Infra-Red Grilling

#### 4.5.1.4 Broiling

Cooking by direct heat from a gas flame, electric wire or coal. Usually used for tender cuts of meat and the temperature is high enough to sear the surface.

Pan broiling is cooking food on a hot metal pan or on a stone on a grill with enough fat to prevent sticking. Excess fat accumulated while cooking is drained off.

Broiling is similar to grilling but uses a heat source above the food rather than below.

**Broiler** - Heat from above.



**Grill** - Heat from below.



Figure 4.12 Broiling and Grilling

#### 4.5.1.5 Gridding

It is done on a solid cooking surface called a griddle without any amount of fat. The temperature is adjustable and is much lower around 350°F / 177°C than on a grill. In addition to meats, items such as eggs and pancakes are cooked on a griddle.

Grooved griddles have a solid top with raised ridges. They are designed to cook like grills, but to create less smoke. Meats cooked on a grooved griddle do not have the charcoal grilled flavor imparted by smoke from burning fats.

#### 4.5.2 Dry-Heat Methods Using Fat

In the dry-heat methods food is mainly cooked by convection of heat through the frying medium. It is also cooked by conduction when the hot fat cooks the surface of the food.

##### 4.5.2.1 Sautéing

Sautéing is a method of cooking food that uses a small amount of fat in a shallow pan over relatively high heat. Sauter means "to jump" in French — the food is cooked until it jumps.

Food that is sautéed is usually cooked for a relatively short period of time over high heat, with the goal of browning the food while preserving its color, moisture and flavor. This is very common with more tender cuts of meat, e.g. tenderloin, pork chops, or filet mignon. Two important points to be considered while sautéing are:

- Preheat the pan before adding the food to be sautéed. The food must be seared quickly or it will begin to simmer in its own juice.
- Do not overcrowd the pan. Doing so lowers the temperature too much and again the food is seared but begins to simmer in its own juices.

Meats to be sautéed are dusted with flour to prevent sticking and to help achieve uniform colour.

The food is sautéed in a liquid such as wine or stock, often swirled in the pan to dissolve browned bits of food sticking to the bottom. This is called deglazing. This liquid becomes part of a sauce served with the sautéed items.



Figure 4.13 Sautéing of Onions

#### 4.5.2.2 Frying

Frying is a method of cooking wherein the food to be cooked is brought directly in contact with hot fat. Frying techniques vary in the amount of fat required, the cooking time, the type of cooking vessel required, and the manipulation of the food. Stir frying, pan frying, shallow frying, deep frying are all standard frying techniques.

##### **Stir Frying:**

In this frying method a traditionally round-bottom iron pan called a wok is heated to a high temperature. A small amount of cooking oil is then poured down the side of the wok followed by dry seasonings (including ginger and garlic), then at the first moment the seasonings can be smelled, meats are added and agitated. Once the meat is seared, vegetables along with liquid ingredients (for example often including premixed combinations of some of soy sauce, vinegar, wine, salt, sugar, and cornstarch) are added. The wok then may be covered for a moment so the water in the liquid ingredients can warm up the new ingredients as it steams off. To keep the meat juicy, usually a cook would take the seared meat out before vegetables are added, and put the meat back right before vegetables are done. In some dishes, or if the cooking conditions are inadequate, different components may be stir fried separately before being combined in the final dish.





Figure 4.14 Stir Frying

The food is stirred and tossed out very quickly using wooden or metal cooking utensils. Some chefs will lift the wok to the side to let the flame light the oil or add a dash of wine spirit to give the food extra flavor. Using this method, many dishes can be cooked extremely quickly (within a minute).

#### **Shallow Fat Frying:**

Only a little fat is used and the food is turned slowly on both sides to ensure that both sides of food are evenly cooked and browned. This method is generally applied to precooked foods or foods that require less time to work e.g. omelet, liver, fish etc.) or for food that contain fat in themselves e.g. bacon, sausages, etc. Fat absorption is greater when food is shallow fried than deep fried.



Figure 4.15 Shallow Fat Frying

### Deep Fat Frying:

The food is completely immersed in large quantity of hot fat, (350°F to 400°F). Fats and oils should not be heated to high temperatures (smoking point) as the fat decomposes at high temperatures. On the other hand if the fat is not hot enough the food beaks up and it absorbs extra fat thus making the product too oily for consumption.



Figure 4.16 Deep Fat Frying

Most of the foods that are to be deep fried requires coating before frying to keep the food in tact and also prevent fat absorption. Materials used as coating are egg, bread crumbs, bengal gram flour and bread crumbs, oatmeal or vermicelli, thinly rolled pastry etc. Sweets and savories are cooked by this method.

Food cooked by deep fat frying has a better appearance and evenly browned than shallow fat frying. While frying the following points should be considered:

- (i) The food should be made into suitable and of even sizes and shapes.
- (ii) The coating should be applied evenly, so as to keep the bread crumbs in tact. Bread crumbs if used should be smooth, evenly rolled and pressed.
- (iii) Food should be added at the correct temperature.
- (iv) Too much of food added at one time lowers the temperature and absorbs oil.
- (v) Fats thicken and become gummy or syrupy if heated several times. This condition is known as polymerization and unfit for further use.
- (vi) Cover the fats between frying periods when left in the pan and maintain at a temperature lower than 200°F and store in a refrigerator.
- (vii) Fat becomes dark if cooked at too high a temperature for too long a period since the loose bread crumbs and small particles of food get charred. Such fat can be strained and reused.





Figure 4.17 Deep Fryer

#### **Advantages of Deep Drying:**

- Very quick method of cooking.
- The calorific values of food is increased since fat is used as the cooking media.
- Frying lends a delicious flavour and attractive appearance to foods.
- Taste and texture are improved.

#### **Disadvantages of Deep Frying:**

- Deep frying produces large amounts of waste oil, which must be properly disposed.
- The food may become soggy due to too much oil absorption.
- Fried foods are not easily digested.
- Repeated use of heated oils will have ill effects on health. Deep fry shortenings contain trans-fat.
- Cooking oil is flammable, and there have occasionally been fires caused by the oil igniting due to too high temperature.

#### **Pan Frying:**

It is a form of frying characterized by the use of less cooking oil than deep frying; enough oil to, at most, cover the food to be cooked only half way. As a form of frying, pan frying relies on oil as the heat transfer medium and on correct temperature to retain the moisture in the food. The exposed topside allows, unlike deep frying, some moisture loss (which may or may not be desirable) and contact with the pan bottom creates greater browning on the contact surface (which may or may not be desirable.) Because of the partial coverage, the food must be flipped at least once to cook both sides. Generally, a shallower cooking vessel is used for pan frying than deep frying. Using a deep pan with a small amount of oil does reduce spatter but the increased moisture around the cooking food is generally detrimental to the preparation. A denser cooking vessel, the pan should feel heavy for its size, is necessarily better than a less dense pan since that mass will improve temperature regulation. An electric *skillet* can be used analogously to an electric deep

fryer and many of these devices have a thermostat to keep the liquid (in this case, oil) at the desired temperature.



Figure 4.18 Pan Frying

A popular entree that would be described as "pan fried" would be fish or seafood.

#### 4.5.2.3 Pressure Frying

Pressure frying is a variation on pressure cooking where meat and cooking oil are brought to high temperatures while pressure is held high enough to cook the food more quickly. This leaves the meat very hot and juicy. A receptacle used in pressure frying is known as a pressure fryer. Pressure frying is mostly done in industrial kitchens. Ordinary pressure cookers are not suitable for pressure frying. The process is most notable for its use in the fried chicken products.



Figure 4.17 Pan Frying

In a standard fryer, even though the fat may be at 350°F / 175°C, the temperature inside the food will not rise above 212°F / 100°C the boiling point of water. Just as in a pressure steamer, a pressure fryer raises this temperature and cooks the food more quickly without excessive surface browning. At the same time, the fat temperature can be lower, 325°F / 165°C or less. Pressure frying requires accurate time, since the product cannot be seen while it is cooking.

## 4.6 MICRO WAVE COOKING

Microwave cooking refers to the use of a specific tool rather than to a basic dry-heat or moist heat cooking methods. Both dry and moist heat methods may be employed with a microwave oven. Microwaving cooking method is unique. Depending on which specific techniques are followed, it may be a moist or a dry method of cookery. Generally, if food is cooked in the microwave using a lid, it is a moist method of cooking. If it is cooked in the microwave without a lid, it tends to be a dry method of cooking.

This equipment is used mostly for heating prepared foods and for thawing the raw or cooked items. However it can be used for primary cooking as well.



Figure 4.18 Microwave Oven

In microwave cooking, the radio waves penetrate the food and excite water and fat molecules pretty much evenly throughout the food. No heat has to migrate toward the interior by conduction. There is heat everywhere all at once because the molecules are all excited together.

Microwaves act in three different ways.

- **Absorption** - when the food is micro waved, the water molecules present in the food get stimulated and heated up and so the energy of the microwave is concentrated on cooking the food faster.
- **Transmission** - Microwaves are attached only to water molecules and so they ignore everything else except the food to be cooked.
- **Reflection** - Microwaves are absorbed by food and pass through materials like glass, china, wood, paper and plastic, but they reflect back on metal.

### Advantages of Microwave Cooking:

- (i) Food cooks evenly, quickly and efficiently in the microwave.
- (ii) Also the nutrients are preserved and the actual taste of the food is retained to a higher degree.

- (iii) Only a minimum amount of oil is required for cooking continental as well as traditional Indian dishes and so it seems desirable from the health point of view.
- (iv) Also shorter and controlled cooking time means that the food does not get burnt or over-cooked.
- (v) Food may be cooked and served in the same dish.
- (vi) Another major advantage is that food is cooked minus the smoke, grease and heat and so the kitchen remains neat and tidy always.
- (vii) Microwave has multifarious uses like de-frosting, re-heating, etc. of food.

#### **Disadvantages of Microwave Cooking:**

- (i) Baked products do not get a brown surface.
- (ii) Microwave cooking cannot be used for simmering, stewing or deep frying.
- (iii) Flavours of all ingredients do not blend well as the cooking time is too short.

### **4.7 SOLAR COOKING**

Solar cooking is a very simple technique that makes use of sunlight or solar energy which is a non-conventional source of energy. Solar cooker consists of a well insulated box which is painted black on the inside and covered with one or more transparent covers.



Figure 4.18 Solar Cooker

The purpose of these transparent covers is to trap heat inside the solar cooker. These covers allow the radiation from the sun to come inside the box but do not allow the heat from the hot black absorbing plate to come out of the box. Because of this, temperature upto 140°C can be obtained which is adequate for cooking.

### Advantages of Solar Cooking:

- (i) Simple technique – requires no special skill.
- (ii) Cost effective as natural sunlight is the form of energy.
- (iii) Original flavour of food is retained.
- (iv) There is no danger of scorching or burning.
- (v) Loss of nutrients is minimum as only little amounts of water is used in cooking.

### Disadvantages of Solar Cooking:

- (i) Special equipment is needed.
- (ii) Slow cooking process.
- (iii) Cannot be used in the absence of sunlight – rainy season, late evening and night.

## CHECK YOUR PROGRESS

### 1. Fill in the blanks

- i) The process of cooking food directly on hot fire is called .....
- ii) To serve chicken safely, it has to reach a temperature of .....
- iii) ..... carries much more heat than boiling water and cooks food very rapidly.
- iv) A person who prepares baked goods as a profession is called a .....
- v) ..... is cooking by dry heat.

### 2. Name three food items which are cooked by deep frying method.

### 3. Tick (✓) the correct answer

- i) It is best to boil food in a
  - a) flat pan
  - b) deep pan
  - c) lot of water
  - d) pressure cooker
- ii) If you throw away the water in which food has been boiled, the food loses
  - a) colour
  - b) taste
  - c) nutrients
  - d) flavour

### 4. True or False

- i) Sugar decreases the boiling point of water.
- ii) There is a loss of water soluble vitamins when it is boiled.
- iii) Water begins to simmer at about 100°C.
- iv) Blanching destroys enzymes in vegetables.
- v) Oil is not required for preparation of food using steam.

**4.8 LET US SUM UP**

Cooking food is an important step in making the raw food consumable and in meeting the nutritional needs of the family. Food has to be pleasing in appearance and taste in order to be consumed. The characteristics desired in the finished product determine which method of cookery will have to be chosen for any given food. While correct preparation of ingredients and correct mixing are necessary, greater skill is needed in the actual cooking of the food. The basic cooking methods such as moist-heat method, dry-heat method, microwave cooking and solar cooking are discussed in detail.

Moist-heat methods are those in which the heat is conducted to the food product by water (including stock, sauces, etc.) or by steam. Dry-heat methods are those in which the heat is conducted without moisture that is by hot air, hot metal radiation or hot fat. These methods serve to caramelize both natural and added sugars in food as it cooks, resulting in better flavour, texture and appearance.

Microwaves are electromagnetic waves of radiant energy with wave lengths in the range of  $250 \times 10^6$  to  $7.5 \times 10^9$  Angstroms. The most commonly used type of microwave generator is an electronic device called a magnetron which generates radiant energy of high frequency. Both dry and moist heat methods may be employed with a microwave oven. This equipment is used mostly for heating prepared foods and for thawing the raw or cooked items. However it can be used for primary cooking as well. Solar cooking is a very simple technique that makes use of sunlight or solar energy which is a non-conventional source of energy.

**4.9 LESSON END ACTIVITY**

- 1) Observe dal, rice, potato curry and brinjal before and after they have been cooked. Record your observations in the table given below.

Food	Before Cooking		After Cooking	
	Colour	Flavour	Texture	Flavour
Dal Palak Potato curry Brinjal				

- 2) Explain why different foods are suitable for the two different types of steaming.

#### 4.10 KEY WORDS

- Skillet** this is long-handled frying pan. Usually round pan has low, gently sloping sides so steam doesn't collect within the pan.
- Chlorophyll** Any of a group of green pigments that are found in the chloroplasts of plants and in other photosynthetic organisms
- Deglaze** To dissolve the remaining bits of sautéed or roasted food in (a pan or pot) by adding a liquid and heating.
- Boiling Point** The temperature at which a liquid boils at a fixed pressure, especially under standard atmospheric conditions.
- Caramelize** To heat sugar until it liquefies and becomes a clear syrup ranging in color from golden to dark brown.
- Rotisserie** A cooking device equipped with a rotating spit on which meat or other food is roasted.

#### 4.11 QUESTIONS FOR DISCUSSION

- 1) Compare the various moist heat methods of cooking.
- 2) Differentiate between deep frying and shallow frying.
- 3) Differentiate between baking and roasting.
- 4) Give a brief account about the principles, merits and demerits of microwave cooking.
- 5) Discuss the dry heat methods of cooking?

#### CHECK YOUR PROGRESS - ANSWER

1. i) roasting                      iv) baker  
ii) 165°F / 74°C                v) Grilling  
iii) Steam
2. Meat, Poultry and Vegetables
3. i) deep pan            ii) nutrients
4. i) False                      iv) True  
ii) True                        v) True  
iii) False

#### 4.12 REFERENCES

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# LESSON 5

## STOCK

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### 5.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Stock categories, types and uses



- Stock - basic preparation method & preparation of stocks

## 5.1 INTRODUCTION

"Stock to a cook is voice to a singer" - Anon.

One of the first lessons of any cooking course is learning how to make stocks. Stocks form the basis of most sauces and soups. Stock is a broth liquid containing the juices of meat, bones or vegetables that have been extracted by long, slow cooking. Stocks are the foundation for many soup recipes, and are a wonderful way to use leftover meats and vegetables.

Flavor, body and clarity are the characteristics of a good stock and of the three; flavor is the most important. To get a good flavor a high proportion of ingredients to water is used. The most flavorful stock is achieved by just covering the bones, shell, or vegetables with water. Chicken and Vegetable stocks are the easiest to prepare and are the mildest in flavor and have become one of the most popular stocks to use in just about anything including fish soup and beef stew.

Cooking times for stocks varies. Once all the flavors and goodness have been extracted from the meat bones and vegetables the stock must be strained. In a stock meat adds flavor whilst the bones add body. Bones from joints such as the knuckles or shoulder contain gelatin, which gives a stock body and a rich smooth texture.

Today, ready-made stock and stock cubes consisting of dried, compressed stock ingredients are readily available. These are commonly known as bouillon cubes (or oxo cubes, after a common brand of stock cube sold in Britain) or cooking base.

## 5.2 STOCK

A stock is a flavorful liquid made by gently simmering bones or vegetables in a liquid to extract their flavor, aroma, color, body, and nutritive value. When bones, vegetables, flavorings, and aromatic ingredients are combined in the proper ratio and simmered for an adequate amount of time, the stock develops a characteristic that is peculiar to a stock type.



Figure 5.1 Stock

Stock is used as the foundation for soups, stews and sauces. They are not served "as is", however. Stock is prepared by simmering various ingredients in water, including some or all of the following components:

### 5.2.1 Components of Stock

**Major Flavoring Ingredients** - The major flavoring ingredients are usually bones and trimmings for meat or fish stocks. Vegetables are used for vegetable essences and *court bouillon*. The bones may be used fresh or frozen.

**Bones** - Bone, Veal, beef, and chicken bones are most commonly used. The flavour of the stock comes from the cartilage and connective tissue in the bones. Connective tissue has collagen in it, which gets converted into gelatin that thickens the liquid. Stock made from bones needs to be simmered for longer than stock made from meat (often referred to as broth). Bones should be cut into 3-inch lengths for quicker and more thorough extraction of flavor, gelatin, and nutritive value. Most bones may be purchased pre-cut into proper length. Chicken and fish bones can be cut with a heavy knife or cleaver.

**Vegetables** - Vegetables for a vegetable stock or *court bouillon* should be prepared according to type. Mushrooms should be trimmed and wiped to remove dirt. Celery should be trimmed and rinsed and the tomatoes should be peeled and seeded.

**Liquid** - Water is the most frequently used liquid for making stock. Remouillage is the best choice for the most richly flavored stock. Wine may also be used. The liquid should be cold when combined with the bones and vegetables.

**Mirepoix** - It is a combination of onions, carrots, celery, and sometimes other vegetables. Often the less desirable parts of the vegetables (such as carrot skins and celery ends) are used since they will not be eaten.

**White mirepoix** - It replaces carrots with parsnips, additional onions and leeks, and occasionally includes chopped mushrooms or mushroom trimmings. It is used for pale or white stocks, sauces and fish fumet.

**Matignon** - It is edible mirepoix, intended to be served as part of the finished dish. The vegetables are peeled and cut into uniform dice. Diced ham is also used to enhance flavor. The ratio in the matignon is two parts carrot, one part celery, one part leek, one part onion, one part mushroom and various herbs and spices.

**Herbs and spices** - The herbs and spices used depend on availability and local traditions. In classical cuisine, the use of a bouquet garni (or bundle of herbs) consisting of parsley, bay leaves, a sprig of thyme and possibly other herbs, is

common. This is often wrapped in a cheesecloth "bag" and tied with string to make it easier to remove it once the stock is cooked.

A stock should taste definite enough to allow for ready identification but not strong enough to compete with the other ingredients used in a finished dish. Fish stock, chicken stock, and brown stock tend to have more assertive flavors. A white veal stock is considered "neutral" in flavor and can be used as a "universal" stock.

## 5.3 CATEGORIES AND TYPES OF STOCKS

### 5.3.1 White Stock

It is made from the meaty bones and trim from veal, beef, poultry, some types of game, and fish. The bones are frequently blanched in order to remove any impurities that might cloud or discolor the finished stock. Ordinary white stock is classically prepared from veal meat and bones, with the addition of poultry carcasses.

A white beef stock (sometimes referred to as a "neutral stock") is often prepared by first simmering the stock at higher temperature than would be used for most stocks for several minutes. The aim is to produce a stock with a nearly neutral flavor. It is often flavored for use in vegetable soups or bean dishes. White beef stock can contribute a significant body to these dishes, while still allowing the flavor of the major ingredient to predominate.

### 5.3.2 Brown Stock

Brown Stock is one of the most commonly called-for stocks in the classic and contemporary repertoire of any kitchen is likely to be brown veal stock (*fond de veau brun*). Brown stocks are prepared by first cooking meaty bones and meat trim to a deep brown color, as well as the mirepoix and a tomato product, before they are simmered. This changes both the flavor and color of the finished stock. Brown stocks are especially valuable in sauce cookery, as they are used as the foundation for brown sauce, demi-glace and pan gravies.

### 5.3.3 Remouillage

*Remouillage* the word translates as a "rewetting", which is a good way to think of the way that remouillage is made. Bones used to prepare a "primary stock" are reserved after the first stock is strained away from the bones. The bones are then covered with water, and a "secondary stock" is prepared. Some chefs argue that, if the first stock was made properly and simmered for the correct amount of time, there will be little if anything left in the bones to provide either flavor or body in the remouillage. Others feel that this second generation of stock can be used as the basis for other broths or as the cooking liquid for braises and stews. The food being prepared will provide the majority of the flavor in the finished sauce,

and a first-rate stock can be reserved for use in dishes where its role is more significant.

#### **5.3.4 Broth (or *Bouillon*)**

Broth shares many similarities with stocks. They are prepared in essentially the same fashion. Meaty bones (or in some cases, the entire cut of meat, bird or fish) are simmered in water (or remouillage or a prepared stock) along with a variety of vegetables and other aromatic ingredients. Many meatless dishes are prepared with a vegetable broth. Some chefs may refer to this preparation as a vegetable stock. Those stocks made from meat or fish bones will reach a state of clarity and body through the extraction of proteins found in bones and meat. Vegetable broths vary greatly in the degree of body and clarity that they may achieve.

#### **5.3.5 Fumet (or Essence)**

The most common fumet is one prepared by sweating fish bones along with vegetables such as leeks, mushrooms and celery, then simmering these ingredients in water, perhaps with the addition of a dry white wine. The end result is generally not as clear as a stock, but it is highly flavored. Fumets and essences can be prepared from such ingredients as wild mushrooms, tomato, celery or celery root, ginger and so forth. These essences, nothing more than highly flavored infusions made from especially aromatic ingredients, can be used to introduce flavor to other preparations, such as *consommés* or broths and a variety of "small sauces".

#### **5.3.6 *Estouffade***

*Estouffade* is the classic formula set down by Escoffier is virtually identical to what was then known as a brown stock. There are some differences to note, however. *Estouffade* is prepared by simmering together browned meaty veal bones, a piece of fresh or cured pork, and the requisite vegetables and other aromatics. Contemporary kitchens tend to prepare a brown stock that does not include pork. Today, *estouffade* is less widely used as a basic preparation, although it is still regarded as a classic preparation.

#### **5.3.7 Court Bouillon**

*Court Bouillon*, a "short broth," is often prepared as the cooking liquid for fish or vegetables. The basic components of a court bouillon include aromatic vegetables and herbs, an acid such as vinegar, wine or lemon juice, and water.

#### **5.3.8 Chicken Stock**

Chicken stock should be cooked for 4–5 hours. Veal stock should be cooked anywhere from 8 hours to overnight.

#### **5.3.9 Jus**

Jus is a rich, lightly reduced stock used as a sauce for roasted meats. Many of these are started by deglazing the roasting pan, then reducing to achieve the rich flavour desired.

### 5.3.10 Fish Stock

Fish stock is made with fish bones and finely chopped *mirepoix*. Fish stock should be cooked for 30–45 minutes—cooking any longer spoils the flavour. Concentrated fish stock is called "fish fumet". In Japanese cooking, a fish and kelp stock called *dashi* is made by briefly (3–5 minutes) cooking skipjack tuna (bonito) flakes called *katsuobushi* in nearly boiling water.

### 5.3.11 Prawn Stock

Prawn stock is made from boiling prawn shells. It is used in Southeast Asian dishes such as *laksa*.

### 5.3.12 Master Stock

Master stock is a special Chinese stock used primarily for poaching meats, flavoured with soy sauce, sugar, ginger, garlic and other aromatics.

### 5.3.13 Glace Viande

*Glace viande* is stock made from bones, usually from veal, that is highly concentrated by reduction.

## 5.4 USES OF STOCK

The three major uses of stocks are:

- as base for sauces and soups
- as base for stews and braises
- as a cooking medium for vegetables and grains.

## 5.5 PREPARING THE BONES

### 1. Preparing the Bones

The bones have to be the right size for a particular stock and be blanched or sweated depending upon the kind of stock that is being made.

### 2. Blanching the Bones

Frozen bones for white stocks are generally blanched to remove any impurities that might cloud the finished stock

- (i) Place the bones in a stockpot
- (ii) Cover them with cold water
- (iii) Bring the water to a slow boil. Skim the surface as necessary.

- (iv) Once a full boil has been reached, drain the bones through a sieve or allow the water to drain away through a spigot. Disregard the water.
- (v) Rinse the bones thoroughly to remove any debris or scum.
- (vi) Follow the remaining recipe.

### 3. Browning the Bones and Mirepoix

The bones may be browned in a rondeau on the stovetop when working with small amounts. A large quantity of bones may be more efficiently browned in the oven, which promotes more even browning with less chance of scorching.

- (i) Prepare the *mirepoix* and reserve.
- (ii) Preheat oven to 400°F.
- (iii) Rinse the bones and dry them well.
- (iv) Place a thin layer of oil in a pan, and place over direct heat or in the oven to Preheat.
- (v) Add the bones in a single layer. Cook until evenly browned, stirring or turning occasionally.
- (vi) Transfer the bones to the stockpot and continue with the next step.
- (vii) Place the *mirepoix* in the pan used for the bones. Cook until evenly browned. Stir occasionally. Add tomato product after the *mirepoix* has browned. Allow the tomato product to brown. Reserve the browned *mirepoix* and add to the stock during the last hour of cooking time.
- (viii) Deglaze the pan with water and add to stock.

### 4. Sweating Bones or Shells

Bones or shell are used in fumets. The proteins present in fish bones and shellfish can take on an unacceptable flavor if allowed to cook too long. Sweating is a procedure that starts flavor release quickly. The stock can be cooked in less than 45 minutes, with full extraction of body and flavor.

- (i) Heat a small amount of oil or clarified butter in a rondeau.
- (ii) Add the bones or shells and *mirepoix*.
- (iii) Cook over moderate heat, stirring occasionally, until the flesh on the bones turns opaque, or the shells have a bright color, and the moisture is released from the *mirepoix*.

## 5.6 STOCK - BASIC PREPARATION METHOD

Although the ingredients may vary, the basic preparation for making stock is the same. Once the major flavor ingredients have undergone any preliminary steps such as blanching, sweating, or browning, all stocks, essences, fumets, and *court bouillons* are prepared the same way.

- (i) Combine the major flavoring ingredients with cold liquids and bring to a simmer. The stock will throw scum to the surface as it begins to cook. This should be skimmed away as necessary throughout the simmering time to develop a clear stock with good flavor.
- (ii) Add the *mirepoix* and aromatics at the appropriate point.
  - a. Add them at the start of cooking time for stocks, fumets, essences, and *court bouillons* simmered for less than an hour.
  - b. Add them for the last hour of cooking time for stocks simmered for less than 1 hour.
- (iii) Simmer for appropriate time, for developing a good flavor, aroma, color, and body.
- (iv) Drain the stock through a sieve or colander into an appropriate container for cooling. A stock's clarity is better preserved if the major flavoring ingredients and *mirepoix* are disturbed as little as possible. If the pot does not have a spigot, ladle the stock from the pot rather than pouring it through a sieve. This is much safer because it is less likely to spill or splash hot liquid. Disregard the bones and aromatics.
- (v) Cool the stock in a cold water bath. Stirring from time to time helps the stock cool more rapidly.
- (vi) Store the stock in containers that are easy to handle to avoid injury from weight. Remove any fat from the surface after the stock has cooled. The fat will harden and form a protective seal. When the stock is to be used, the fat seal can easily be lifted away and discarded.

## 5.7 PREPARATION OF STOCK COMPONENTS

The preparations of some important stock components are given below:

### 5.7.1 Preparation of *Mirepoix*

<b><i>Mirepoix</i></b>	
Yield: 2 cups	
Onions, peeled and chopped	1 cup
Carrots, trimmed and chopped	½ cup
Celery, trimmed and chopped	½ cup



Cut the vegetables into an appropriate size based on the cooking time of the dish

### 5.7.2 Preparation of *White Mirepoix*

<b>White Mirepoix</b>	
Yield: approx. 2 cups	
Onions, peeled and chopped	½ cup
White portion of leeks, trimmed and chopped	½ cup
Parsnips, trimmed and chopped	½ cup
Celery, trimmed and chopped	½ cup
Mushroom trimmings	¼ cup
Cut the vegetables into an appropriate size based on the cooking time of the dish.	

### 5.7.3 Preparation of *Matignon*

<b>Matignon</b>	
Yield: 2 cups	
Onions, peeled and diced small	½ cup
Carrot, trimmed, peeled and diced small	½ cup
Celery, trimmed, peeled and diced small	½ cup
Mushroom, diced small	¼ cup
Bacon or ham, diced small or minced	¼ cup
Cut all the vegetables and the bacon or ham into a neat, small dice and combine. Sweat in whole butter.	

### 5.7.4 Preparation of *Sachet d'epices*

<b>Sachet d'epices</b>	
Yield: ¼ cup	
Parsley stems, chopped	3 or 4
Thyme leaves	½ teaspoon
Bay leaf	1
Cracked black peppercorns	½ teaspoon
Garlic clove crushed	1 glove
The above ingredients are placed into a 4" square of cheesecloth and tied into a sack.	



## 5.8 PREPARATION OF STOCKS

### 5.8.1 Preparation of Chicken Stock

Chicken Stock	
Yield: 4 ltrs	
Chicken bones, cut into 3-inch lengths	3 kg
Cold water or <i>remouillage</i>	6 ltr
<i>Mirepoix</i>	2 cup
Standard <i>sachet d'epices</i>	1
<ol style="list-style-type: none"> <li>1. Rinse the bones; blanch them if they are frozen.</li> <li>2. Combine the bones and water.</li> <li>3. Bring them slowly to a boil.</li> <li>4. Skim the surface, as necessary to remove scum and dirt.</li> <li>5. Simmer the stock for 5 hours.</li> <li>6. Add mirepoix and sachet d' epices. Simmer additional 1 to 2 hours.</li> <li>7. Strain and cool.</li> </ol>	

### 5.8.2 Preparation of Fish Stock

Fish Stock	
Yield: 5 ltrs	
Fish bones and trimmings of Beekti, surmai	2 kg
Cold water	5¼ ltr
Finely sliced onions	250 gms
Bay leaf	1 no
Peppercorns	8 nos
Parsley stalks	20 gms
White mushroom trimmings	15 gms
Juice of lemon	1 lime
Butter	75 gms
<ol style="list-style-type: none"> <li>1. Place the aromatics in the bottom of a buttered saucepan on top of the blanched shredded onions.</li> <li>2. Add the cleaned and cut fish bones and trimmings.</li> <li>3. Add the lemon juice and sweat the bones etc.</li> <li>4. Moisten with water, bring to the boil, skim, allow to simmer for 20 minutes (maximum)</li> <li>5. Strain through a muslin, reboil and cool or use as required.</li> </ol>	
<p><u>Note:</u> 20 minutes will extract all the flavours from the bones, excess cooking will make the stock bitter and cause it to deteriorate. Care must be taken over the simmering as a fish stock, will</p>	

“cloud” much more quickly than a meat stock.

## 5.9 EVALUATING QUALITY OF STOCK

A good stock is evaluated by flavor, color, aroma, and clarity.

**Flavor** - If the correct procedure and ratio of bones, mirepoix, and aromatics to liquids has been followed, the flavor should be well balanced, rich, and full-bodied.

**Color** - White stocks and fish fumet should have a very light color that turns translucent. Brown stocks are a deep amber or brown because of the roasting process.

**Aroma** - The aroma should be appealing but not over pungent. When stock is reboiled it should be tested for sour taste and smell.

**Clarity** - Most stock, with the exception of vegetable essences and fish fumet, should be almost crystal clear when hot. This is maintained by proper simmering. Never allow the stock to boil continuously, and also skim the stock during the cooking process. Skimming removes the impurities that are trapped by the coagulated albumen that rises to the top during the cooking process.

## CHECK YOUR PROGRESS

1. True or False
  - i) White stock is obtained by not allowing the bones to brown.
  - ii) Brown stock is prepared from bones not allowed to brown.
  - iii) Chicken and fish stocks are very different in preparation.
  - iv) Flavour, body and clarity are the important characteristics of good stock.
  - v) Of the above mentioned three, flavour is most important.

## 5.10 LET US SUM UP

A stock is a flavorful liquid made by gently simmering bones or vegetables in a liquid to extract their flavor, aroma, color, body, and nutritive value. Stocks are the foundation for many soup recipes, and are a wonderful, efficient and economic way to use leftover meats and vegetables.

Flavor, body and clarity are the characteristics of a good stock and of the three; flavor is the most important. Cooking times for stocks varies. Once all the flavors and goodness have been extracted from the meat bones and vegetables the stock must be strained. Although the ingredients may vary, the basic preparation for making various stocks is the same. Once the major flavor

ingredients have undergone any preliminary steps such as blanching, sweating, or browning, all stocks, essences, fumets, and *court bouillons* are prepared the same way

Stocks are used as base for sauces and soups, as base for stews and braises, and as a cooking medium for vegetables and grains. A good stock is evaluated by flavor, color, aroma, and clarity.

### 5.11 LESSON END ACTIVITY

1. Prepare various types of stock and record:
  - a) Differences in appearance
  - b) Differences in taste and flavour

### 5.12 KEY WORDS

<b>Knuckle</b>	A cut of meat centering on the carpal or tarsal joint, as of a pig.
<b>Essence</b>	An extract that has the fundamental properties of a substance in concentrated form.
<b>Cartilage</b>	A tough, elastic, fibrous connective tissue found in various parts of the body, such as the joints, outer ear, and larynx.
<b>Spigot</b>	A wooden faucet placed in the bunghole of a cask.
<b>Stockpot</b>	A pot used for preparing soup stock.

### 5.13 QUESTIONS FOR DISCUSSION

1. What are the different types of stock?
2. What is the role of stock in food preparation?
3. What are the components that give body to stocks?
4. What skimming is necessary in stock preparation?
5. What is meant by neutral stock / universal stock?

### CHECK YOUR PROGRESS - ANSWER

1. 

i) True	iv) True
ii) False	v) True
iii) False	

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# LESSON 6

## SAUCES

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### 6.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate the appropriate skills, and show an understanding of the following:

- Sauces and their importance
- Thickening agents used in sauces
- Mother sauces & preparation methods

### 6.1 INTRODUCTION

“Sauce is to culinary art, what grammar is to language”  
- Grimande De La Royere

The word "sauce" is a French word that means a relish to make our food more appetizing. Sauces are liquid or semi-liquid foods devised to make other foods look, smell, and taste better, and

hence be more easily digested and more beneficial. Because of the lack of refrigeration in the early days of cooking, meat, poultry, fish, and seafood didn't last long. Sauces and gravies were used to mask the flavor of tainted foods. Sauces are one of the fundamentals of cooking.

Sauces may be prepared. Sauces, such as soy sauce, which are usually bought, not made, by the cook; or cooked sauces, such as Béchamel sauce, which are generally made just before serving. Sauces for salads are called salad dressing. Another variation is the pan sauce; this is made by adding an aromatic (such as chopped shallot) to a pan that has previously cooked meat, which has left hardened juices (called the fond) in the pan.

A person who specializes in making sauces is often referred to as a "saucier", a French term borrowed for its situational usefulness. Sauces are an essential element in cuisines all over the world. Some famous sauciers include Julia Child, Benjamin Christie, Bobby Flay, Yutake Ishinabe, and François Pierre La Varenne.

## 6.2 SAUCES

Sauce is a thickened liquid that is flavored or seasoned to enhance the flavor of the food that it is to accompany. The sauce can be sweet, sour, spicy, or savory and may be added to the food to become part of a main dish or used as an accompaniment to the food being prepared. Sauces add a variety of features to foods, such as complimenting or enhancing flavors, succulence, attractive appearance, and additional texture.

### 6.2.1 Importance of Sauces

- (i) A sauce enhances flavour.
- (ii) Sauce like white sauce adds creaminess to firm and dry food thus giving moistness the food.
- (iii) Sauces like mint sauce, apple sauce with roast pork help in digestion.
- (iv) Sauce add colour to the food.
- (v) Sauce served as an accompaniment, sometimes gives a contrast taste to another food.
- (vi) Sauce enhances the nutritional value of the dish.
- (vii) Sauce gives tartness and contrasts or balances a bland food. Example: Devil sauce served with eggs gives appealing tartness.
- (viii) Sauce makes food more palatable.

## 6.3 THICKENING AGENTS USED IN SAUCES

Sauces, unless they're jus type sauces, shouldn't be thin and watery. There are many ways to thicken a sauce. The following are the few sauce-thickening agents:

**Cornstarch** - Cornstarch is actually flour. It is the endosperm of corn kernels that has been dried and ground, much the same way that wheat flour is made (in England cornstarch is actually called cornflour). Like other flours, cornstarch makes a good thickening agent. It is frequently used in Asian cooking and a clear sheen is typical of sauces thickened with cornstarch.

**Flour and making a roux** - Used as a thickening agent for sauces, the traditional roux is equal amounts of flour and a fat (usually butter) cooked together. The length of time that the flour is cooked depends on the color of the sauce being made. Cooked for a short time, the roux has little color and is used for white sauces. As cooked longer, the flour browns and results in a darker sauce.

**Eggs yolks and cream** – Yolks or cream are added as a finishing agent at the end of cooking. The product is never boiled, when liaison is added, or it would curdle. The liaison is added to thicken delicate cream or velout sauces or cream soups.

#### 6.4 MOTHER SAUCES

Mother sauces are also called *Grand Sauces*. These are the five most basic sauces that every cook should master. Antonin Careme, founding father of French "grande cuisine," came up with the methodology in the early 1800's by which hundreds of sauces would be categorized under five Mother Sauces, and there are infinite possibilities for variations, since the sauces are all based on a few basic formulas. The five Mother Sauces are:

- **Béchamel** - sauces that are made with milk and pale roux. Common sauces in this group include Crème, Mornay and Soubise.
- **Brown (demi-glace) or Espagnole** - sauces that are brown stock-based, such as brown sauces. Common sauces in this group include bordelaise, chasseur, chateaubriand, diable, diane, estragon, lyonnaise, *madère*, madeira, and zingara.
- **Velouté** - sauces that are made with white stock and roux. Common sauces in this group include allemande, ravigote, *suprême*, and white bordelaise.
- **Red or Tomato Sauces** - tomato based sauces. Common sauces in this category include spaghetti sauce, marinara and a wide variety of tomato sauces.
- **Emulsions** - sauces that are emulsified such as *hollandaise* or *mayonnaise*.

#### 6.5 BÉCHAMEL SAUCE

*Béchamel* sauce (pronounced (bay-shah-mel) also known as white sauce is usually made today by whisking scalded milk gradually into a white flour- butter roux, though it can also be made

by whisking a kneaded flour-butter *beurre manié* into scalded milk. The thickness of the final sauce depends on the proportions of milk and flour. Sauce *béchamel* is one of the very few French sauces that is easy to prepare but is flavorful and delicate enough to serve on its own or as the basis for some fifty more complex sauces. This sauce, is widely used with vegetables, eggs, fish, poultry, hot hors d'oeuvres and dishes that are finished under the grill.

*Béchamel* sauce is the base for a number of other classic sauces including: Mornay sauce (cheese); Nantua sauce (shrimp, butter and cream); *Crème* sauce (heavy cream); Mustard sauce (prepared mustard); Soubise sauce (finely diced onions that have been sweated in butter); Cheddar cheese sauce (cheddar cheese, dry mustard, Worcestershire sauce)

### 6.5.1 Preparation of *Béchamel* Sauce

*Béchamel* sauce can be prepared in two ways. The first recipe that follows is considered traditional and takes more than an hour to prepare. The second is a quick method and will take only about 5 minutes. Some people prefer the first method. Others say that it is impossible to tell the difference between the two. Cooks can try both methods at least once before deciding on which method best suits their needs.

<b><i>Béchamel</i> Sauce - Traditional Method</b>	
Clarified butter	5 Tbsp.
Very lean veal, cut in small dice	50 gms
Flour	5 Tbsp.
Milk, brought to a boil before using	3 cups
Onion, chopped	2 Tbsp.
Thyme	1 small sprig
Bay leaf	1
Nutmeg	1 pinch
Salt and White pepper to taste	
<ol style="list-style-type: none"> <li>1. In a small skillet melt 1 Tbsp. of the butter and in this cook the veal gently without allowing it to brown.</li> <li>2. In a saucepan melt the remaining butter and to this add the flour and cook together over a low flame, stirring constantly with a wooden spoon for 5 minutes.</li> <li>3. To this mixture (which is known as a "roux"), add the boiling milk, mix well, add the veal and remaining ingredients and simmer very gently for 45 minutes to 1 hour. Strain through a cloth.</li> <li>4. If not using the sauce immediately, float a thin film of milk or melted butter on the top of the sauce and set aside uncovered or keep it hot by placing it in the top pot of a double boiler over hot but not boiling water.</li> </ol>	



## 6.6 BROWN (DEMI-GLACE) OR *ESPAGNOLE* SAUCE

The basic method of making *espagnole* is to prepare a very dark brown roux, to which are added several gallons of veal stock or water, along with 20–30 lb (9–14 kg) of browned bones, pieces of beef, many pounds of vegetables, and various seasonings. This blend is allowed to slowly reduce while being frequently skimmed. The classical recipe calls for additional veal stock to be added as the liquid gradually reduces but today water is generally used instead. Tomato sauce is added towards the end of the process, and the sauce is further reduced.

*Espagnole* has a strong taste and is rarely used directly on food. As a mother sauce, however, it then serves as the starting point for many derivative sauces. A typical *espagnole* recipe takes many hours or even several days to make, and produces four to five quarts of sauce. In most derivative recipes, however, one cup of *espagnole* is more than enough, so that the basic recipe will yield enough sauce for 16 to 20 meals. Frozen in small quantities, *espagnole* will keep practically indefinitely.

### 6.6.1 Preparation of *Espagnole*

<b><i>Espagnole</i></b>	
Yield: 1 ltr	
Fat	30 gms
Flour	70 gms
Tomato puree	30 gms
Brown stock	1¼ gms
Mirepoix	1 cup
Fresh pork rind finely chopped	3 gms
Parsley, Celery and Bay Leaf	
Cut the vegetables into an appropriate size based on the cooking time of the dish	

## 6.7 VELOUTÉ SAUCE

*Velouté* or blond sauce is basically a *bechamel* sauce made with stock instead of milk. In preparing a *velouté* sauce, a light stock (one in which the bones used have not been roasted), such as chicken, veal or fish stock, is thickened with a blond roux.

Thus the ingredients of a *velouté* are butter and flour to form the roux, a light chicken, veal, or fish stock, salt and pepper for seasoning. Commonly the sauce produced will be referred to by the type of stock used e.g. chicken *velouté*.

It is often served on poultry or seafood dishes, and is used as the base for other sauces. Sauces derived from a *velouté* sauce include allemande sauce (by adding lemon juice, egg yolks, and

cream), *suprême* sauce (by adding mushrooms and cream to a chicken *velouté*) and berycy sauce (by adding shallots and white wine to a fish *velouté*).

### 6.7.1 Preparation of Velouté Sauce

<b>Velouté Sauce</b>	
Yield: 1 $\frac{3}{4}$ cup	
White stock (veal, chicken, or fish)	1½ cup
Unsalted butter	2 tbsp
Flour	3 tbsp
Salt & Pepper, to taste	
<ol style="list-style-type: none"> <li>1. In a medium sized saucepan melt the butter.</li> <li>2. Remove the pan from the stove and quickly stir in the flour.</li> <li>3. Return the pan to the heat and cook the paste mixture, stirring frequently until it turns pale and straw-like in colour. This should take several minutes.</li> <li>4. Take the pan off the heat again and whisk or stir in half of the stock. Make sure that the paste has dissolved and a liquid has formed without any lumps.</li> <li>5. Return the pan to the heat and stir in the remaining stock. Bring the liquid to a gentle simmer.</li> <li>6. Reduce the heat but continue to simmer the sauce for about 25 minutes, stirring from time to time and skimming off any skin that forms on the top.</li> <li>7. Once the sauce has reached the desired consistency, season with salt and pepper and strain the sauce through a sieve.</li> </ol>	

## 6.8 TOMATO SAUCE

A tomato sauce is any of a very large number of sauces made primarily out of tomatoes, usually to be served as part of a dish (rather than as a condiment). Tomato sauces are common for meat and vegetables, but they are perhaps best known as sauces for pasta dishes.

Tomatoes have a rich flavor, a low liquid content, very soft flesh which breaks down easily, and the right composition to thicken up into a sauce when they are cooked (without the need of thickeners like roux). All of these make them ideal for simple and appealing sauces.

The simplest tomato sauces consist just of chopped tomato flesh (with the skins and seeds optionally removed), cooked in a little olive oil and simmered until it loses its raw flavour, and seasoned with salt.

Water (or another, more flavorful liquid such as stock or wine) is often added to keep it from drying out too much. Onion and garlic are almost always sweated or sauteed at the beginning before the tomato is added. Other seasonings typically include basil, oregano, parsley, and possibly some spicy red pepper or black pepper. Ground or chopped meat is also common.

Sauces derived from tomato sauce are: Bretonne; Tomated Chaudfroid; Portugaise; Italienne; Barbecue; Green tomato sauce; Salsa; Puttanesca; Tomato gravy.

### 6.8.1 Preparation of Tomato Sauce

<b>Tomato Sauce</b>	
Yield: 1 cup	
Fresh tomatoes	1 kg
Olive oil	1 tbsp
Onion peeled and chopped	1
Garlic cloves peeled and crushed	3
Brown sugar	
Salt and freshly milled black pepper	
<ol style="list-style-type: none"> <li>1. Put the tomatoes in a big bowl. Pour boiling water over the tomatoes until every one is submerged. After a few minutes drain the tomatoes and hold them under running cold water. Slip their skins off.</li> <li>2. Heat the oil in a medium saucepan, then add the onion and garlic and let them gently cook for 5-6 minutes, until they are softened and golden. Now add the tomatoes. Simmer the tomatoes on a very low heat, without a lid for 1½ hours or until all the liquid had evaporated and the tomatoes are reduced to a thick, jam-like consistency, stirring now and then.</li> <li>3. Add salt and pepper to taste.</li> <li>4. If the sauce is extremely acidic add brown sugar in teaspoon increments.</li> </ol>	

## 6.9 EMULSIONS

Emulsion is a mixture of two liquids that normally can't be combined. Combining oil and water is the classic example. Emulsifying is done by slowly adding one ingredient to another while simultaneously mixing rapidly. This disperses and suspends tiny droplets of one liquid through another.

However, the two liquids would quickly separate again if an emulsifier were not added. Emulsifiers are liaisons between the two liquids and serve to stabilize the mixture. Eggs and gelatin are

among the foods that contain emulsifiers. In mayonnaise, the emulsifier is egg yolk, which contains lecithin, a fat emulsifier. Emulsion sauces are hollandaise and mayonnaise.

### 6.9.1 Hollandaise Sauce

Hollandaise Sauce (pronounced HOL-uhn-dayz). This is an emulsion of butter and lemon juice using egg yolks as the emulsifying agent, usually seasoned with salt and a little black pepper or cayenne pepper. It is served hot with vegetables, fish, and eggs (like egg benedict). It will be a pale lemon color, opaque, but with a luster not appearing oily. The basic sauce and its variations should have a buttery-smooth texture, almost frothy, and an aroma of good butter.

Hollandaise requires some skill and knowledge to prepare; care must also be taken to store it properly after preparation. Properly made, the sauce should be smooth and creamy. The flavor should be rich and buttery, with a mild tang added by the lemon juice and seasonings. It must be made and served warm, not hot. If the ingredients are emulsified improperly by over-or under-heating them they will separate, resulting in the sauce "breaking" from the emulsion and the yolks coagulating from excessive heat. The sauce may be portioned and frozen for future use. When ready to use, let it come to room temperature; some stirring may be required.

The following list is a non-exhaustive listing of minor-sauces created by adding ingredients to Hollandaise Sauce (as a 'mother sauce'): Sauce Mousseline; Sauce Béarnaise; Sauce Maltaise; Sauce Divine; Sauce Noisette; Sauce Bavaoise; Sauce Colbert.

#### 6.9.1.1 Preperation of *Hollandaise* Sauce

<b><i>Hollandaise</i> Sauce</b>	
Yield: 1 cup	
White-wine vinegar	2 tbsp
Cold water	2 tbsp
Salt	¼ tsp
White pepper to taste	
Egg yolks	3
Unsalted butter, cut into tbsp. pieces	1 cup
Softened fresh lemon juice	2 tbsp
Cayenne	¾ tsp

1. Boil vinegar, 2 tablespoons water, salt, and white pepper in a 1½-quart heavy saucepan until reduced to about 2 tablespoons. Remove from heat and stir in remaining tablespoon water.
2. Whisk in yolks, then cook over very low heat, whisking constantly, until thickened (be careful not to scramble yolks), about 1 minute. Whisk in butter 1 piece at a time, lifting pan occasionally to cool sauce and adding each piece before previous one is completely melted.
3. Remove from heat and whisk in lemon juice, cayenne, and salt to taste.

### 6.9.2 *Mayonnaise*

*Mayonnaise* (often abbreviated mayo) is a thick condiment, whitish-yellow in color. *Mayonnaise* is a basic cold sauce. It is used as a salad dressing and as an accompaniment.

*Mayonnaise* is made by combining lemon juice or vinegar with egg yolks. Eggs (containing the emulsifier lecithin) bind the ingredients together and prevent separation. Then, oil is added drop by drop as the mixture is rapidly whisked. Adding oil too quickly (or insufficient, rapid whisking) will keep the two liquids from combining (emulsifying). But, as the sauce begins to thicken, oil can be added more rapidly. Seasonings are whisked in after all of the oil has been added. Worldwide, mayonnaise is most commonly served in a sandwich, or with salad such as potato salad or canned tuna ("tuna mayo" or tuna salad). Numerous other sauces can be created from it by adding additional seasonings.

*Mayonnaise* is the base for many other chilled sauces and salad dressings. For example:

- Aioli is olive-oil *mayonnaise* combined with garlic.
- Rouille is aioli with added red pepper or paprika.
- Tartar sauce is *mayonnaise* spiced with pickled cucumbers and onion. Capers, olives, and crushed hardboiled eggs are sometimes included. A simpler recipe calls for sweet pickle relish and more lemon juice.
- Fry sauce is a mixture of *mayonnaise*, ketchup or another red sauce.
- Mayonesa is a lime-flavored *mayonnaise*, usually found in Mexican or Spanish grocers in North America.
- Ranch dressing is made of buttermilk or sour cream, *mayonnaise*, and minced green onion, along with other seasonings.
- Honey Mustard is made primarily of *mayonnaise* and includes lemon juice, mustard, and brown sugar.

### 6.9.2.1 Preparation of *Mayonnaise*

<b><i>Mayonnaise</i></b>	
Egg yolks	2
Vegetable or olive oil	340 ml
Lemon juice or white wine vinegar	1 tbsp.
Dijon mustard	1-2 tsp
Salt and pepper	

1. In a large mixing bowl whisk together the egg yolks with a pinch of salt.
2. Add one drop of oil to the egg yolks and whisk together with an electric whisk.
3. Continue to add one drop of oil at a time, whisking continuously until the mixture begins to blend together and thicken. The process is to add one drop of oil and then blend it in before adding the next drop. This will take several minutes.
4. After a quarter of the oil has been blended, add the lemon juice or vinegar and beat into the mixture.
5. Continue to whisk in the remaining oil, which you should be able to add a lot quicker by now, in a thin stream.
6. Once all the oil has been beaten in, add the mustard to give extra taste and season with salt and pepper.
7. If the mayonnaise is too thick, you can whisk in a few teaspoons of boiling water.
8. Chill the mayonnaise in the refrigerator before serving.

### CHECK YOUR PROGRESS

1. Fill in the blanks
  - i) Sauces used for salads are called .....
  - ii) Fond is ..... sticking to sauce pan used in the preparation of stock.
  - iii) *Velouté* prepared by the use of chicken stock is called .....
  - iv) Emulsion is a suspension to two normally non-miscible liquids such as ..... and .....
2. What are the thickening agents used in sauce making?
3. What sauces do to food?

## 6.10 LET US SUM UP

Sauce is liquid or sometimes semi-solid food served on or used in preparing other foods. Sauces are not consumed by themselves; they add flavor, moisture, and visual appeal to another dish. Sauce is a French word taken from the Latin *salsus*, meaning salted. Sauces need a liquid component, but with dishes such as pasta can contain more solid elements than liquid.

Initially perfected by the French, all sauces are now universally categorized into one of 5 groups of sauces serving as a base or foundation for other sauces and referred to as the Grand or Mother Sauces.

The five mother sauces are: **Béchamel** sauces that are made with milk and pale roux. Common sauces in this group include *crème*, mornay and soubise. **Brown (demi-glace) or Espagnole** - sauces that are brown stock-based, such as brown sauces. Common sauces in this group include bordelaise, chasseur, chateaubriand, diable, diane, estragon, lyonnaise, *madère*, madeira, moscovite, mushroom, piquante, porto, robert, romaine, tarragon, and zingara. **Velouté** - sauces that are made with white stock and roux. Common sauces in this group include allemande, ravigote, *suprême*, and white bordelaise. **Red or Tomato Sauces** - tomato based sauces. Common sauces in this category include spaghetti sauce, marinara and a wide variety of tomato sauces. **Emulsions** - sauces that are emulsified such as *hollandaise* or *mayonnaise*.

## 6.11 LESSON END ACTIVITY

1. Prepare the said mother sauces and record their characteristics.
2. Find out the quick preparation method of *Béchamel* sauces.

## 6.12 KEY WORDS

<b>Emulsifier</b>	any ingredient used to bind together normally nonmiscible substances, such as oil and water.
<b>Saucier</b>	is a position in the classical brigade style kitchen, who is responsible for all sautéed items and most sauces.
<b>Fond</b>	A French term used in culinary parlance for "stock". Crumb sticking to the pan used for cooking meat.

## 6.13 QUESTIONS FOR DISCUSSION

1. Define sauce.
2. What is meant by mother sauce?
3. List six major mother sauces.
4. What is meant by emulsifiers?
5. What is meant by fond? Where is it used?

### CHECK YOUR PROGRESS - ANSWER

1.
  - i) salad dressing
  - ii) brown crust
  - iii) Chicken *velouté*
  - iv) water, oil or fat
  
2.
  - a) Corn torch
  - b) Roux (flour and butter)
  - c) Egg yolk
  - d) Cream
  - e) Gelatin
  
3. Enhances taste of food, enhances flavour, add creaminess and moistures and tenderizes food (meat).

### 6.14 REFERENCES

- 1) Peterson James (1998), Sauces, John Wiley & Sons.
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# UNIT III





## LESSON 7

### HERBS, SPICES AND CONDIMENTS

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#### 7.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate the appropriate skills, and show an understanding of the following:

- Herbs and their varieties
- Uses of Herbs
- Spices and their varieties
- Uses of Spices
- Condiments, their varieties and uses

#### 7.1 INTRODUCTION

It is hard to imagine what cooking would be like without the unique flavors provided by herbs, spices, and the many seasonings available. For centuries they have been an integral part of many of the world's great cuisines. Today we take for granted black pepper and the other spices over which wars were once fought. At one time only kings and other wealthy people could afford such a delicacy as cinnamon. Today all supermarkets and most small grocery stores have well-stocked spice shelves offering a wonderful selection of herbs and spices.

The term "spices" is often used broadly to include all seasonings. Spices come from the bark, roots, leaves, stems, buds, seeds, or fruit of aromatic plants and trees which usually grow only in tropical countries. Pepper, allspice, cloves, nutmeg and mace, cinnamon, ginger, saffron, and turmeric are spices.

Herbs are a great way to spice up a meal. Herbs are soft, succulent plants which usually grow in the temperate zone. Until recently cooks have had to make do with very few fresh herbs, such as sage, parsley, and thyme. Nowadays you can also find fresh basil, coriander, mint, curry leaf, chervil, tarragon, rosemary, and dill. Since herbs are at their best when they are young and freshly picked, it is well worth growing.

Condiments add sparkle and flavor to a variety of dishes. Condiments are a simple, fun way to brighten flavors and add complexity to dishes.

## 7.2 HERBS


Herb is a plant that is valued for qualities such as medicinal properties, flavor, scent, or the like.






Herbs are flavoring agents due to the essential oils present and are used for enriching or altering the flavor or odor of foods. Different herbs have different uses. Also different parts of the plant are used. It might be leaves, seeds, fruits, buds, barks, or roots.






Herbs have a variety of uses including culinary, medicinal, or in some cases even spiritual usage. The green, leafy part of the plant is often used, but herbal medicine makes use of the roots, flowers, seeds, root bark, inner bark (cambium), berries and sometimes the pericarp or other portions. General usage differs between culinary herbs and medicinal herbs. A medicinal herb may be a shrub or other woody plant, whereas a culinary herb is a non-woody plant, typically using the succulent leaves. Any of the parts of the plant, as well as any edible fruits or vegetables, might be considered "herbs" in medicinal or spiritual use.







## 7.3 VARIETIES OF HERBS

Culinary herbs are basically distinguished from vegetables in that they are used in smaller amounts, and they also provide flavor, rather than substance, in food. A number of herbs are used in food throughout the world. Some of the popularly used herbs are listed below.

VARIETIES OF HERBS	
<b>Mint</b> Mint is used throughout the world to flavor everything from lamb to candy. It's also a great garnish and breath freshener. Spearmint is the variety of mint and it's the	

<p>best choice for savory dishes.</p>	
<p><b>Basil</b></p> <p>Basil is also known as Sweet Basil or Tulsi. Basil is most commonly recommended to be used fresh; in cooked recipes it is generally added at the last moment, as cooking quickly destroys the flavour. Basil is absolutely essential for Italian cooking.</p>	
<p><b>Cilantro or Coriander</b></p> <p>Cilantro or coriander not only has two common names, but two entirely different identities and uses. Cilantro, <i>Coriandrum sativum</i>, describes the first or vegetative stage of the plant's life cycle. After the plant flowers and develops seeds, it is referred to as coriander.</p> <p>Cilantro is the Spanish word for coriander leaves. It is also sometimes called Chinese or Mexican parsley. Technically, coriander refers to the entire plant. It is a member of the carrot family.</p> <p>Coriander is the dried seed of the cilantro. The seeds are round like tiny balls. They are used whole or ground as a flavoring for food and as a seasoning. The seeds are used in curries, curry powder, pickles, sausages, soups, stews, and ratatouille. The essential seed oil is used in various herbal remedies and dietary supplements, and to flavor gin, vermouth, liqueurs, tobacco and perfumery.</p>	  
<p><b>Chervil</b></p> <p>Chervil often referred to as the “gourmet or French parsley,” chervil tastes mildly of licorice combined with pepper imparting certain freshness to a dish. Fresh or dried, it is a bright green and quite delicate and should be added to a dish at the end of cooking. Chervil has a tendency to enhance the flavors of other herbs when used in combinations.</p>	

<p><b>Dill</b></p> <p>Fresh and dried dill leaves (sometimes called "dill weed" to distinguish it from dill seed) are used as herbs. The leaves and umbels of dill are a traditional favorite for pickling, but they can be used with a wide range of foods. Dill leaves provide a pleasantly strong seasoning when chopped into garden salads, cottage cheese, potato salads, meat or fish dishes, soups, stews, and sauces.</p>	
<p><b>Chives</b></p> <p>These slender, hollow shoots have a mild onion flavor. Many cooks use scissors to cut fresh chives, sprinkling them like confetti on potatoes, eggs, and salads. They lose much of their flavor when they're frozen or freeze-dried.</p>	
<p><b>Anise</b></p> <p>Anise is the dried ripe fruit of the herb <i>Pimpinella anisum</i>. Anise is used whole or crushed in cookies, cakes, breads, cheese, pickles, stews, fish, and shellfish. Roasting enhances the flavor.</p>	
<p><b>Fennel</b></p> <p>The leaves and stems can be used in much the same way as celery. Florence fennel bulbs are used in salads or as the main ingredient in a salad or lightly steamed as a vegetable accompaniment. Fennel seeds are the ingredient that gives Italian sausage its characteristic taste.</p>	
<p><b>Marjoram</b></p> <p>Marjoram is sweeter and milder than its close relative, oregano. It's often used to season meats and fish, and works best when its added near the end of the cooking period. Fresh is best, but frozen or dried marjoram are acceptable substitutes. It combines well with many other herbs and is used with thyme, tarragon, bay, and parsley to make a bouquet garnish.</p>	

<p><b>Oregano</b> (Pronounced: uh-REG-uh-no)</p> <p>Oregano is a popular herb in Mediterranean countries, where it's often used to season tomato sauces, meat dishes, and pizzas. Mexican oregano has a mintier taste than ordinary oregano.</p>	
<p><b>Bay leaves</b></p> <p>Bay leaves are used extensively in Mediterranean cuisines, lending a woody flavor to sauces, stews, and grilled meats. It's best to add whole leaves, then remove them before serving the dish.</p>	
<p><b>Hyssop</b> (pronounced: HISS-up)</p> <p>The leaves and small blue flowers of this plant are used as a garnish or to impart a mild, slightly bitter flavor to salads, soups, and liqueurs.</p>	
<p><b>Parsley</b></p> <p>Parsley is prized both for its looks and for its fresh, grassy flavor. There are two common varieties: the mild curly parsley and the more flavorful Italian parsley. Frozen parsley is a good substitute for fresh, but dried parsley adds only color.</p>	
<p><b>Rosemary</b></p> <p>The Italians are particularly fond of this pungent herb with its needle-like leaves. They often use it to flavor meats and tomato sauces. Rosemary stems, stripped of their leaves, can also be used as skewers for kabobs. Dried rosemary is an excellent substitute for fresh.</p>	
<p><b>Thyme</b> (pronounced: TIME)</p> <p>This herb is widely used in Mediterranean countries to flavor stews and meat sauces. It's often used in combination with other herbs, like rosemary, parsley, and oregano.</p>	

## 7.4 USES OF HERBS

The culinary uses of herbs are vast.

- 1) Palatability - The flavour and the colours make the dish more palatable.



- 2) Enhance flavour - Those wishing to retain flavor while reducing their intake of salt find herbs indispensable in their cooking.
- 3) Improve Appearance: The appearance of the food
- 4) Helps in digestion – Herbs aid in digestion.
- 5) Cost Effective – Herbs are relatively cheaper. They are affordable by all.
- 6) Nutritional Benefits - Everyone benefits nutritionally when herbs are part of a recipe. For example, parsley is the third most nutritious vegetable rich in vitamin A and chlorophyll which contributes to healthy red blood cells. All fresh herbs are a healthy addition to main courses, soups, salads, and side dishes.

## 7.5 PRESERVING FRESH HERBS

The faster the herbs dry, the more flavorful the resulting dried herb will be.

- **Conventional Oven:** Place clean dry herb sprigs on a foil-lined baking sheet. Bake at the lowest setting until herbs are dry and brittle. This should take about 12 hours. Strip leaves from stems & place in small airtight storage containers. Forced air drought oven are preferable over closed ovens.
- **Air Drying:** Tie small bunches of herbs with string and hang upside down by the stems in a dry warm open spot out of direct sunlight. Be sure air circulates freely around the bunches. Let dry till leaves are brittle. This usually takes a few days to a week, depending on the thickness of the leaves. Pick off the dried leaves & store in tightly covered containers in a cool, dry place about two weeks or till dry and brittle.
- **Microwave Drying:** Pick when the dew has just gone off. Put on paper towels on a plate in the microwave. Zap on high for a minute to start (at that point they appear "wet"). Stir them, zap again for another minute, move around again, and zap approximately 30 seconds more or until they are dry and crumbly. Rub between your hands to break up, pick out any twiggy parts and put in small jars or baggies.
- **Freezing Herbs:** Wrap in foil or plastic wrap. You can also chop clean herbs, place in ice cube trays & fill with water. When needed remove herb ice cubes and drop into hot cooking liquid. You can also wrap bunches of fresh herbs in foil or plastic wrap and freeze them for several weeks. You should expect some discoloration of frozen herbs. Mark the date on the container of your dried herbs. They can be kept for one year. Heat, moisture and light rob herbs of flavor. You can also make herb butters and herb vinegars.

**7.6 SPICES**





A spice is a dried seed, fruit, root, bark or vegetative substance used in nutritionally insignificant quantities as a food additive for the purpose of flavoring, and sometimes as a preservative by killing or preventing the growth of harmful bacteria.







Many of these substances are also used for other purposes, such as medicine, religious rituals, cosmetics, perfumery or eating as vegetables. For example, turmeric is also used as a preservative; licorice as a medicine; garlic as a vegetable and as medicine as well. In some cases they are referred to by different terms.






In the kitchen, spices are distinguished from herbs. Herbs are leafy, green plant parts used for flavoring purposes. Herbs, such as basil or oregano, may be used fresh, and are commonly chopped into smaller pieces. Spices, however, are dried and often ground or grated into a powder. Small seeds, such as fennel and mustard seeds, are used both whole and in powder form.

**7.7 VARIETIES OF SPICES**

The following are the different varieties of spices:

<b>VARIETIES OF HERBS</b>	
<p><b>Allspice</b></p> <p>Allspice comes from a single tree, but it tastes like a mixture of cinnamon, cloves, and nutmeg.</p>	
<p><b>Cardamom (Cardamon)</b></p> <p>Cardamom has a strong, unique taste, with an intensely aromatic fragrance. Black cardamom has a distinctly more astringent aroma, though not bitter, with coolness similar to mint, though with a different aroma. It is a common ingredient in Indian cooking, and is often used in baking in Nordic countries. It is one of the most expensive spices by weight, and only a small quantity is needed to impart the flavor.</p>	
<p><b>Cassia cinnamon</b></p> <p>With its warm, sweet flavor, cinnamon is one of the biggest workhorses on the spice shelf. Cooks often use it to flavor baked goods and drinks, but cinnamon also works wonders in stews, sauces and dishes like bryani or pulav.</p>	
<p><b>Clove</b></p> <p>Cloves are nail-shaped dried unopened flower</p>	

<p>buds that have a sweet, penetrating flavor. They can be ground and used to flavor baked goods or sauces, or left whole and poked into roasted hams or pork. Use cloves sparingly a little goes a long way. Used usually in combination with cinnamon</p>	
<p><b>Coriander seeds (pronounced: CORE-ee-an-dehr)</b></p> <p>Coriander seeds are a common ingredient in the cuisines of India, the Middle East, Latin America, and Southeast Asia. The popular herb cilantro comes from the same plant, but it's not a good substitute for the seeds. The commonest use of coriander seed is in curry powders, where it is the bulkiest constituent, often rough ground in India to give a crunchy texture. The seeds can be likewise used in stews and soups. They blend well with smoked meats and game and feature in traditional English black pudding recipes and Italian mortadella sausage.</p>	
<p><b>Cumin (Jeera)</b></p> <p>Cumin is a key ingredient in Southwestern chili recipes, but it's also widely used in Latin America, North Africa, and India. Freshly roasted and ground cumin seeds are far superior to packaged ground cumin.</p>	
<p><b>Dill seed</b></p> <p>Dill seed tastes like dill leaves, but it's much stronger. It's a common ingredient in pickles, dips, and potato salad.</p>	
<p><b>Fennel seed (pronounced: FEN-uhl)</b></p> <p>This is similar to anise seed, but sweeter and milder. It pairs well with fish, but Italians also like to add it to sauces, meat balls, and sausages. Both the seeds and the stalks from the plant are sometimes called fennel. If a recipe calls for a large amount, it probably intends for you to use the stalks.</p>	
<p><b>Mustard seeds</b></p> <p>Mustard seeds have a hot, pungent flavor. They're often ground and made into prepared mustard or added to stews and sauces to give them some zip. Indian cooks usually prefer the smaller and more pungent brown mustard</p>	

<p>seeds or black mustard seeds.</p>	
<p><b>Poppy seeds (<i>pronounced: POP-ee</i>)</b> These tiny, nutty seeds are typically used in baked goods, but some cuisines also use them in savory dishes. Europeans prefer black poppy seeds, while Indians prefer white, but the two kinds can be substituted for one another. Poppy seeds are high in fat.</p>	
<p><b>Sesame seed</b> These nutritious seeds have a mild, nutty flavor. They're commonly used in baked goods, Asian stir-fries, and Middle-Eastern candies</p>	
<p><b>Saffron</b> Saffron is the world's most expensive spice. It only takes a few threads to add saffron's distinct yellow color and earthy aroma to a family meal of paella or bouillabaisse. The threads should be red with orange tips. Threads lacking orange tips may be dyed. Holland and Kashmir are the major sources of saffron. Kashmir saffron is considered to be the best.</p>	
<p><b>Pepper</b> These come in different colors and potencies. Green peppercorns are packed in brine, vinegar, or salt soon after they're picked. They're mild and soft and can be eaten whole. Black pepper and white pepper are both dried, and sold either ground or as whole peppercorns. Black pepper has a stronger flavor and is far more popular than white; many cooks just use white pepper when they want to avoid having black specks in a light-colored sauce.</p>	

## 7.8 USES OF SPICES

- 1) Enhance flavour: Dishes would be inspid and bland if the spices were not added, because they give a good flavour and stimulate appetite.
- 2) Improve Appearance: Some of the spices give colour to the food and improve appearance of the dish. Turmeric, saffron,

coriander leaves, poppy seeds add colour to food which makes the dish attractive and appetising.

- 3) Improve palatability: The spices like coriander seeds, paprika, pepper enhances the taste of the food.
- 4) Act as preservative: Many foods are preserved for a longer time with the help of spices. Spices that have the preservative quality are turmeric, cloves, mustard and asfoetida. Pickling is one of the forms of preserving.
- 5) Used for medicinal purposes: Spices are used as a remedy for various health problems. Turmeric has antiseptic properties, Saunf helps in digestion.

## 7.9 CONDIMENTS

A condiment is a prepared edible substance or mixture, often preserved or fermented, that is added in variable quantities, most often at the table, to make food more suitable to the diner's taste. Some condiments are dry such as a mixture of herbs and seasonings or Parmesan cheese. However many are preserved sauces that have been put into a bottle, jar, or other container. For convenience, some condiments are provided in single-serving packets often with take-out foods. Many condiments are most likely not to be eaten on their own. Although sometimes considered a condiment, salt is more strictly a seasoning than a condiment, as it has not been prepared.

Condiments may be served on the side or as a garnish may be added as a topping to a hot dog. When served separately, the amount is usually at the diner's discretion. However condiments may be added prior to serving. For example a deli sandwich made with mayonnaise and mustard. Some condiments may also be used during cooking to add flavor or texture. For example barbecue sauce, teriyaki sauce and soy sauce all of which have flavors that can be enhanced by cooking them with foods.

## 7.10 VARIETIES OF CONDIMENTS

**Barbecue Sauce** (also abbreviated BBQ sauce):

It is a liquid flavoring sauce or condiment ranging from watery to quite thick. As the name implies, it was created as an accompaniment to barbecued foods. While it can be applied to any food, it usually tops meat after cooking or during barbecuing, grilling, or baking. Traditionally it has been a favored sauce for pork or beef ribs and chicken. On rarer occasions, it is used for dipping items like fries, as well as a replacement for tomato sauce in barbecue-style pizzas.

**Soy Sauce:**

Soy sauce is made from soybeans that have been fermented and salted. It's used throughout Asia, with different regions producing quite different variations. Japanese soy sauce (shoyu) is

sweeter and less salty than Chinese soy sauce. Chinese soy sauce is primarily made from soybeans, with relatively low amounts of other grains. There are two main varieties:

- Light or fresh soy sauce: A thin (as in non-viscous), opaque, dark brown soy sauce. It is the main soy sauce used for seasoning, since it is saltier, but it also adds flavour. Since it is lighter in color, it does not greatly affect the color of the dish.
- Dark/old soy: A darker and slightly thicker soy sauce that is aged longer and contains added molasses to give its distinctive appearance. This variety is mainly used during cooking since its flavour develops under heating.

### **Brown Sauce:**

Brown sauce (meat stock based) is a sauce based upon meat stock, found in French, Danish, Icelandic, Norwegian and Finnish cuisines. Steak sauce (more commonly known as brown sauce in many countries) is a spiced condiment containing fruits and vinegar.

### **Duck Sauce:**

Duck sauce is an orange-hued Chinese American condiment used in Chinese American cuisine as a dip for deep-fried dishes, such as spring rolls, egg rolls, noodles, and deep-fried chicken balls. Duck Sauce is almost certainly an American invention, as it is virtually unknown in authentic Chinese cuisine. It is made from sweet plums or other fruit such as peach or apricot, sugar, vinegar, ginger, and chili pepper. It is also commonly referred to as plum sauce.

### **Hoisin Sauce:**

Hoisin sauce, or Haixian Sauce also called suckling pig sauce, is a Chinese dipping sauce. Hoisin sauce is similar to the sweet noodle sauce made from fermented soybeans, but has the added ingredients of garlic, vinegar, and chili peppers. Additionally, it tastes less pungent than sweet noodle sauce. Mandarin-style Hoisin sauce ingredients include water, sugar, soybeans, white distilled vinegar, rice, salt, wheat flour, garlic, and red chili peppers, and several preservatives and coloring agents. Traditionally, Hoisin sauce is made using sweet potato.

### **Chinese Mustard:**

Mustard is most often used as a condiment on meat, especially cold meats. It is also used as an ingredient in mayonnaise and vinaigrette, in marinades and barbecue sauce. It can also be used as a base for salad dressing when combined with vinegar and/or olive oil. Mustard is a popular accompaniment to hot dogs and Bratwurst. Dry mustard, typically sold in tins, is used in cooking and can be mixed with water to become prepared mustard.

### **Tomato Paste:**



Tomato paste is a thick paste made from ripened tomatoes with skin and seeds removed. Depending on its manufacturing conditions, it can be used to make either ketchup or reconstituted tomato juice. Its most common culinary usage is as a pizza sauce base, but it is also used in small quantities to enrich the flavor of sauces, particularly tomato sauce. It is most commonly available in tin cans and squeeze tubes.

#### **Tomato puree:**

Tomato purée can be used in soups, stews, sauces, or any other dish where the tomato flavor is desired, but not the texture. It is often deprecated by professional chefs, who find it to have an overly cooked flavor compared to other forms of canned tomatoes.

#### **Mint Sauce:**

Mint sauce is a sauce made from finely chopped mint leaves, soaked in vinegar, and a small amount of sugar. Occasionally the juice from a squeezed lime is added. The sauce should have the consistency of double cream. In British and Irish cuisine it is traditionally used as an accompaniment to roast lamb or, in some areas, mushy peas. Mint sauce can sometimes be used in recipes in place of fresh mint, for instance it can be added to yoghurt to make a mint raita.

#### **Worcestershire Sauce:**

It is a widely used fermented liquid condiment. Worcestershire sauce is often an ingredient of Caesar Salad and can be used as steak sauce. Welsh rarebit is a combination of cheese, mustard, Worcestershire sauce, and other ingredients, frequently eaten with bread, toast or crackers. Marylanders often use this sauce in their famous crab cakes.

#### **Chutney (Chatni):**

Chutney is a term for a variety of sweet and spicy condiments, originally from the Indian subcontinent. Chutney, as a genre, is often similar to the salsa of Latin American cuisine, or European relish insofar as it usually involves a fresh, chopped primary vegetable / fruit with seasonings added, to be used as a condiment for another food. Chutney may be dry or wet; dry chutney is generally in the form of powder. In India, chutney is often made to be eaten fresh, using whatever suitable strongly flavoured ingredients are locally traditional or available at the time.

Many authentic types of chutney contain significant amounts of fresh green chili peppers; the other main ingredient can be any of a wide variety of fruits and vegetables. Most vegetable chutneys are prepared cold in a blender, while many fruit chutneys do require cooking. Popular chutneys include: Coconut chutney; Onion chutney; Tomato chutney; Coriander (Cilantro) and/or mint chutney (both are often called Hari chutney, where 'Hari' is Hindi for 'Green'); Tamarind chutney (Imli chutney); Mango chutney (made from unripe, green

mangos); Lime chutney (made from whole, unripe limes); Garlic chutney made from fresh garlic, coconut and groundnut; Green tomato chutney.

Herbs, Spices and  
Condiments

### 7.11 USES OF CONDIMENTS

- 1) Improve appearance: Condiments improves the appearance of the food. "We eat with our eyes, and choosing colorful condiments can enhance the nutritional value of a routine food." says a famous dietician.
- 2) Nutritious: Some condiments are rich in minerals, trace elements flavouring agents and essential oils.
- 3) Low-fat diet: Condiments can be the key to helping you stay on a low-fat diet.
- 4) Easy and quick to prepare food: Dark leafy greens and tomatoes added with condiments replace the mayo. Thus a quick lunch with a serving or more of vegetables and little excess fat can be served easily.
- 5) Adds flavour: Condiments added to foods enhance the flavor and today they are getting more compliments than ever. They used to be bit players in most meals, but as Americans seek ways to cut fat from their diets they're finding that condiments can add lots of flavor without the fat, if chosen properly.
- 6) Affordable: Condiments are an affordable indulgence. People tend to use them in small amounts. It can be kept in the refrigerator for a relatively long time. Affordable condiments are an affordable indulgence. People tend to use them in small amounts. It can be kept in refrigerator for a relatively long time.

### CHECK YOUR PROGRESS

1. Fill in the blanks
  - i) The flavour used the colours of herbs make the dish more .....
  - ii) Basil is also known as .....
  - iii) ..... is used as a breath freshner.
2. True or False
  - i) The term 'spices' is often used broadly to include seasonings.
  - ii) Herb is a plant that is valued for qualities such as medicinal properties, flavour, scent, etc.
  - iii) Coriander is the dried seed of the clove.
  - iv) Herbs help in digestion.
3. List out the methods of preserving fresh herbs.



## 7.12 LET US SUM UP

Herbs have a variety of uses including culinary, medicinal, or in some cases even spiritual usage. Herbs are flavoring agents used for enriching or altering the flavor or odor of foods. Different herbs have different uses. Also different parts of the plant are used. It might be leaves, seeds, fruits, buds, barks, or roots.

A spice is a dried seed, fruit, root, bark or vegetative substance used in nutritionally insignificant quantities as a food additive for the purpose of flavoring, and sometimes as a preservative by killing or preventing the growth of harmful bacteria.

Herbs and spices are used to improve appearance, enhance flavour, make the food more palatable, and used as preservatives.

A condiment is a prepared edible substance or mixture, often preserved or fermented, that is added in variable quantities, most often at the table, to make food more suitable to the diner's taste.

## 7.13 LESSON END ACTIVITY

- 1) Collect various herbs available locally. And preserve them in any of the methods explained in this lesson.
- 2) Visit a grocery shop and note the popular brands of various condiments available.

## 7.14 KEY WORDS

<b>Sprig</b>	A sprig is about a 4-inch long piece of stem with the leaves still attached.
<b>Pericarp</b>	is the botanical term for the tissue surrounding a seed that develops from the ovary wall of the flower.
<b>Umbels</b>	is a flower cluster having stalked flowers arranged singly along an elongated unbranched axis (umbellifer).
<b>Liqueurs</b>	any of various strongly flavored alcoholic beverages typically served in small quantities after dinner.

## 7.15 QUESTIONS FOR DISCUSSION

1. Give the brief description about the varieties of herbs.
2. What are the culinary uses of herbs?
3. Enumerate the uses of spices.
4. Discuss briefly about few varieties of condiments.
5. What are the uses of condiments?

## CHECK YOUR PROGRESS - ANSWER

1. i) palatable    ii) tulsi    iii) Mint
2. i) True    ii) True    iii) False    iv) True
3. (i) Convectional Oven drying    (iii) Microwave drying  
(ii) Air Drying    (iv) Freezing Herbs

Herbs, Spices and  
Condiments

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## LESSON 8

### SALAMI AND SAUSAGES

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8.0	Aims and Objectives
8.1	Introduction
8.2	Sausage
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#### 8.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Sausages
- Types of sausage
- Salami
- Salami ingredients and manufacturing process
- Varieties of salami

#### 8.1 INTRODUCTION

Sausage is a convenience food available in a great number of varieties and flavors. Sausages are an excellent source of high quality protein, containing all the essential amino acids in appropriate amounts necessary for growth, maintenance and repair of body tissue. Sausage also provides significant amounts of vitamins and minerals.

The word sausage originally comes from the Latin word *salsus*, which means salted or preserved. In the olden days people did not have refrigeration to preserve their meat and so making sausage was a way of overcoming this problem. Sausage making evolved as an effort to economize and preserve meat that could not be consumed fresh at slaughter. In sausage making, quality standards are maintained while using most parts of the animal carcass.

Sausage grew in popularity and brought fame and fortune to many sausage makers and to various cities. Basically people living in particular areas developed their own types of sausage and that sausage became associated with the area. For example Bologna originated in the town of Bologna in Northern Italy, Lyons sausage from Lyons in France and Berliner sausage from Berlin in Germany. Today more than 250 varieties are sold, and many of these can be traced back to the town and country of origin.

The contemporary role of sausage fits conveniently into our modern lifestyles as an elegant appetizer for entertaining as well as the main course in "quick-and-easy" meals. Furthermore, sausages are a relatively safe product to consume because of the added effects of salt, pH, cure, drying and cooking to preserve the product all of which eliminate harmful bacteria.

Salami is a cured sausage, fermented and air-dried. Salami may refer specifically to a class of salumi (the Italian tradition of cured meats), where an individual sausage or style of sausage (e.g. Genoa) would be referred to with the singular Italian form salame. Alternatively, in general English usage, salami may be singular or plural and refer to a generic style or to various specific regional styles from Italy or elsewhere, such as France or Germany. The name comes from the Latin/Italian root sal-, meaning 'salt'.

Historically, salami has been popular amongst Italian peasants due to being a meat product able to be stored at room temperature for periods of up to a year, supplementing a possibly meager or inconstant supply of fresh meat.

## 8.2 SAUSAGES

Sausage (pronounced SAW-sidge) is a prepared food product usually made from ground meat, animal fat, salt, and spices, and sometimes other ingredients such as herbs, and generally packed in a casing. Sausage making is a very old food preservation technique.

Traditionally casings have been made of animal intestines, though they are now often synthetic. Some sausages are cooked during processing, and the casing may be removed at that time. Sausages may be preserved by curing, drying in cool air, or smoking. The distinct flavor of some sausages is due to fermentation by *Lactobacillus* during curing.

There is no consensus if similar products not packed in casings, such as pâté, meatloaf, scrapple and head cheese should be considered sausage.

Besides being eaten on its own, sausage is also used as an ingredient in other foods.

### 8.3 TYPES OF SAUSAGE

Sausages are made from beef, veal, pork, lamb, poultry and wild game, or from any combination of these meats. Sausage making has become a unique blend of old procedures and new scientific, highly-mechanized processes. Traditionally, sausage was formed into a *symmetrical* shape, but it now can be found in a variety of shapes and sizes to meet consumers' needs. Many sausage products are vacuum packed, freshness dated and 100% edible.

Sausages can be classified in a variety of ways, but probably the most useful is by how they are processed. Processing methods give sausages easily recognizable characteristics.

#### 1. Cooked Sausage:

Made with fresh meats and then fully cooked. The sausage is either eaten immediately after cooking or must be refrigerated and is usually reheated before eating. Examples include Braunschweiger, Veal sausage and Liver sausage.

#### 2. Cooked Smoked Sausage:

Much the same as cooked sausage, but it is cooked and then smoked, or smoke-cooked. It can be eaten hot or cold, but is stored in the refrigerator. Examples include Wieners, Kielbasa and Bologna.

#### 3. Fresh Sausage:

Made from meats that have not been previously cured. This sausage must be refrigerated and thoroughly cooked before eating. Examples include Boerewors, Italian Pork sausage and Fresh Beef sausage.

#### 4. Fresh Smoked Sausage:

This is fresh sausage that is smoked. After smoking, the sausage can then be refrigerated and cooked thoroughly before eating. Examples include Mettwurst and Roumanian sausage.

#### 5. Dry Sausage:

Made from a selection of meats. These are the most complicated of all sausages to make, as the drying process has to be carefully controlled. Once produced this type of sausage can be readily eaten, and will keep for very long periods under refrigeration. Examples include Salami's and Summer sausage.

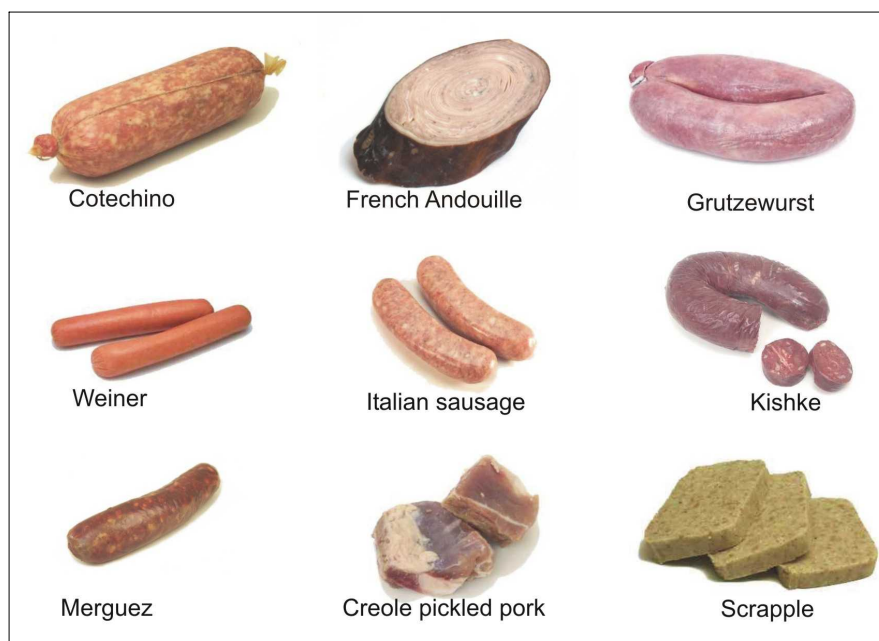


Figure 8.1 Sausages

## 8.4 SALAMI

Salami is a cured (fermented and air-dried) sausage of Italian tradition. The name comes from the Italian verb salare, meaning 'to salt.'

Historically, salami has been popular amongst Italian peasants due to being a meat product able to be stored at room temperature for periods of up to a year, supplementing a possibly meagre or inconstant supply of fresh meat.

### 8.4.1 Ingredients of Salami

A traditional salame is made from a mixture which may include the following:

- chopped beef, pork, donkey
- wine (not always)
- salt
- various herbs and spices.

Other types of salami, such as imported brands from Italy or Spain typically substitute herd meats, such as donkey or ox into the mixture, which is then left to cure separately, leaving a marbled effect. The raw meat mixture is usually allowed to ferment for a day and then the mixture is either stuffed in an edible natural or non-edible artificial casing or hung to cure. The casings are often treated with an edible mold (*Penicillium*) culture as well. The mold is desired as it imparts flavor and prevents spoilage during the curing process.

More modern (but still traditional) mixtures include additional ingredients to assist in the fermentation process. These ingredients

aim to take the guesswork out of traditional curing and can be found in many of the finest salami varieties in the world, although some producers eschew the nitrates and nitrites due to health concerns.

#### 8.4.2 Manufacturing Process

Though uncooked, salami are not raw; they have been prepared via curing. The term cotto salame refers to salami cooked or smoked before or after curing. This is done to impart a specific flavor but not to cook the meat. Before curing, a cotto salame is still considered raw and is not ready to be eaten. Most kinds of salami made from donkey or ox are considered "cotto".

Salami is cured in warm, humid conditions in order to encourage growth of the bacteria involved in the fermentation process. Sugar is added as a food source for the bacteria during the curing process, although it tends not to be added to horse meat due to the latter's naturally high levels of glycogen. Lactic acid is produced by the bacteria as a waste product, lowering the pH and coagulating and drying the meat. The acid produced by the bacteria makes the meat an inhospitable environment for other, dangerous bacteria and imparts the tangy flavor that separates salami from machine-dried pork. The flavor of salami relies just as much on how this bacterium is cultivated as it does on quality and variety of other ingredients. Originally, the bacteria were introduced into the meat mixture with wine, which contains other types of beneficial bacteria; now, starter cultures are used. The whole process takes about 36 weeks, although some age it more for additional taste and some can cut it down to about 24 weeks for a sweeter taste.



Figure 8.2 Curing Process of Salami

The curing process is determined by the climate of the curing environment and the size and style of casing. After fermentation, the sausage has to be dried. This changes the casings from being water-permeable to being reasonably airtight. A white covering of either mold or flour helps prevent the photo-oxidation of the meat and rancidity in the fat.



Under some conditions the nitrate probably comes from the breakdown of proteins. Salt, acidity, nitrate levels and dryness of the fully-cured salami combine to make the raw meat safe to consume.

## 8.5 VARIETIES OF SALAMI

Varieties of salami include:

- 1) **Beerwurst, Beer Salami** is a cooked sausage of German origin; beef and pork, chopped and blended; seasoning includes garlic; cooked at high temperatures; smoked. Packaged in slices or in bulk rolls for slicing.
- 2) **Calabrese Salami** is a dry sausage of Italian origin; usually made from all pork; seasoned with hot peppers.
- 3) **Cooked Salami** is made from fresh meats, which are cured, stuffed in casings, and then cooked in the smokehouse at high temperatures. May be air dried for a short time; softer texture than dry and semi-dry sausages. Cooked salamis are not dry sausage. They belong to the cooked sausage group and must be refrigerated.
- 4) **Cotto Salami** is cooked salami; contains whole peppercorns; may be smoked as well as cooked.
- 5) **Easter Nola** is a dry sausage of Italian origin; coarsely chopped pork; mildly seasoned; spices include black peppers and garlic.
- 6) **Genoa Salami** is a dry sausage of Italian origin; usually made from all pork but may contain a small portion of beef; moistened with wine or grape juice; seasoned with garlic; a cord is wrapped lengthwise and around the sausage at regular intervals.
- 7) **German Salami** is less highly flavored and more heavily smoked than Italian; contains garlic.
- 8) **Hungarian Salami** is less highly flavored and more heavily smoked than Italian salami; contains garlic.
- 9) **Italian Salami** includes many varieties named for towns and localities, e.g., Genoa, Milano, Sicilian; principally cured lean pork, coarsely chopped and some finely chopped lean beef; frequently moistened with red wine or grape juice; usually highly seasoned with garlic and various spices; air dried; chewy texture.
- 10) **Kosher Salami** is all beef cooked salami. The meat and the processing are under rabbinical supervision. Mustard, coriander and nutmeg added to regular seasonings.



### CHECK YOUR PROGRESS

1. What are the ingredients used in the sausage?
2. As a food, what is provided by sausages?
3. Fill in the blanks
  - i) Sausage is preserved by drying in .....
  - ii) Distinctive flavour and tanginess is due to .....
  - iii) Salami is usually ..... and .....
  - iv) Salami takes ..... to ..... weeks to air dry.
  - v) Basillus produces ..... acid which imparts distinctive flavour and controls ..... during curing.

### 8.6 LET US SUM UP

The word sausage originally comes from the Latin word *salsus*, which means salted or preserved. In the olden days people did not have refrigeration to preserve their meat and so making sausage was a way of overcoming this problem.

Salami is a cured (fermented and air-dried) sausage of Italian tradition. The name comes from the Italian verb *salare*, meaning 'to salt'.

A traditional salami is made from a mixture which may include the following; chopped beef, pork, donkey, wine (not always), salt and various herbs & spices.

### 8.7 LESSON END ACTIVITY

1. Try to taste and record the result of available sausages and salami in the market/pantry.

### 8.8 KEY WORDS

<b>Eschew</b>	To avoid; shun
<b>Tangy</b>	Having a taste characteristic of that produced by acids
<b>Coarsely</b>	Consisting of large particles; not fine in texture
<b>Rancidity</b>	The development of unpleasant flavours in oils and fats as a result of oxidation.

### 8.9 QUESTIONS FOR DISCUSSION

- 1) What prompted sausage making?
- 2) What is meant by Kosher salami?
- 3) How salami is classified?

### CHECK YOUR PROGRESS - ANSWER

1. Made from ground meat, animal fat, salt and spices. Meat may come from beef, veal or pork, individually or in combination.
2. Proteins, amino acids, vitamins and minerals.
3.
  - i) in the hot air
  - ii) Lactobasillus
  - iii) fermented, air-dried
  - iv) 24, 36
  - v) lactic, pathogens

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## LESSON 9

### CEREALS AND PULSES

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#### 9.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Cereals and their varieties
- Pulses and their varieties

#### 9.1 INTRODUCTION

Staple foods are those which are eaten regularly as part of the daily diet and nearly always include cereals and / or pulses. Rice, for example, is widely consumed in Asia, whereas beans, maize, cassava, potato, banana, etc. are more popular staple food in many African, Latin American and Caribbean countries.

The great variety of national dishes and dietary patterns that have sustained diverse populations throughout the world for centuries, clearly indicates that different combinations of food can lead to adequate nutritional status. These combinations may include foods from different groups like cereals, pulses, fruits and vegetables, milk and milk products, nuts and oilseeds, meat, fish and poultry etc. However, cereals, starch foods and pulses play a predominant role in diets of developing countries. Cereals and pulses are the cheapest sources of food energy and contribute a high percentage of calories and proteins in the diets of Indian population.

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.

Owing to low moisture content, cereals and pulses are relatively stable during storage and processing is not so much for preservation but rather to make them convenient to cook and eat and add variety to the diet.

Both cereals and pulses are nutritionally important since they usually provide the bulk of the diet and energy needs. They are also a relatively cheap sources of energy, protein, vitamins and minerals.

## 9.2 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.

### 9.3 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:







#### 9.3.1 Rice


Rice is the most important food crop in Asia. It can be cooked whole and served with stir-fries, sauces, and curries, or made into flour, wine, Japanese Saké cakes, vinegar, milk, flakes, noodles, paper, and tea.

Rice is classified mostly by the size of the grain. Long-grain rice is long and slender. The grains stay separate and fluffy after cooking, so this is the best choice if you want to serve rice as a side dish, or as a bed for sauces. Medium-grain rice is shorter and plumper, and works well in paella and risotto. Short-grain rice is almost round, with moist grains that stick together when cooked. It's the best choice for rice pudding and molded salads.

Other specialty varieties include Spanish rice for paella, glutinous rice for sushi and rice balls, and risotto rice for risotto. Most varieties are sold as either brown or white rice, depending upon how they are milled. Brown rice retains the bran that surrounds the *kernel*, making it chewier, nuttier, and richer in nutrients.

White rice lacks the bran and germ, but is more tender and delicate. It's less nutritious than brown rice, but you can partially compensate for that by getting enriched white rice. Brown rice takes about twice as long to cook as white rice. Converted rice is beige. It tastes a lot like white rice, but it has more nutrients. Instant rice is white rice that's been precooked and dehydrated when needed to serve, it can be rehydrated and served. It is convenient, but expensive and bland.

<b>Rice Varieties</b>	
<p><b>1 Basmati rice</b></p> <p>This aromatic, long-grain rice is grown in the foothills of the Himalayas and is especially popular in India. The cooked grains are dry and fluffy, so they make a nice bed for curries and sauces. Basmati is available as either white or brown rice.</p>	
<p><b>2 Instant rice (precooked rice)</b></p> <p>This is white rice that's been precooked and dehydrated so that it cooks quickly. It's relatively expensive and you sacrifice both flavor and texture. White instant rice cooks in about five minutes, brown in about ten.</p>	
<p><b>3 Jasmine rice (Thai basmati rice)</b></p> <p>Jasmine rice is long-grain rice produced in Thailand that's sometimes used as a cheap substitute for basmati rice. It has a subtle floral aroma. It's sold as both a brown and white rice.</p>	
<p><b>4 Bhutanese red rice</b></p> <p>This red short-grain rice is a staple in rural areas of Bhutan. It has a strong, nutty flavor and is best served with other assertive ingredients. It cooks much faster than brown rice.</p>	
<p><b>5 Black forbidden rice</b></p> <p>This has short grains which turn a beautiful indigo when cooked.</p>	
<p><b>6 Glutinous (Chinese sweet rice)</b></p> <p>Despite its name, this rice isn't sweet and it doesn't contain gluten. Instead, it's very sticky, short-grain rice that is widely used by Asians to make sushi and various desserts.</p>	

<b>7</b>	<p><b>Himalayan red rice</b></p> <p>This is a Himalayan version of our long-grain brown rice, only the bran is red, not brown</p>	
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### 9.3.2 Wheat

Wheat is a domesticated grass from the Levant that is cultivated worldwide. Globally, wheat is an important human food, its production being second only to maize among the cereal crops; rice ranks third. Wheat grain is a staple food used to make flour for leavened, flat and steamed breads; cookies, cakes, pasta, noodles and *couscous* and for fermentation to make beer, alcohol, vodka or biofuel.


Wheat is planted to a limited extent as a forage crop for livestock, and the straw can be used as fodder for livestock or as a construction material for roofing thatch.

Wheat's got a pleasant, nutty flavor and lots of nutrients, but it is prized most for being rich in gluten, the stuff that makes baked goods rise. Most wheat is ground into flour, but whole or cracked grains are used in pilafs and salads, and wheat flakes are made into hot cereals or granolas.

Wheat contains gluten which makes the dough rise. Wheat with low gluten is used for biscuits and high gluten content for breads. Wheat contains relatively more protein than rice. Wheat is also consumed as breakfast cereal with milk and sugar. The different varieties of wheat are discussed below:

<b>Wheat Varieties</b>		
<b>1</b>	<p><b>Wheat berries (hard wheat berries)</b></p> <p>These are wheat kernels that have been stripped only of their inedible outer <i>hulls</i>. They're nutritious, but they take hours to cook.</p>	
<b>2</b>	<p><b>Soft wheat berries (pastry berries)</b></p> <p>These are softer than hard wheat berries.</p>	
<b>3</b>	<p><b>Cracked wheat</b></p> <p>These are cracked whole wheat kernels. They cook faster than wheat berries, but not as fast as bulgur.</p>	







<b>4</b>	<p><b>Wheat flakes (rolled wheat)</b></p> <p>This is wheat that's been steamed, rolled, and flaked. Wheat flakes are often cooked as a hot cereal, or added raw to granola mixes.</p>	
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### 9.3.3 Corn

Corn is the only grain that's commonly eaten as a fresh vegetable. Native to the Americas, corn is a great source of vitamin A, fiber, and other nutrients.

Sweet corn is char-broiled or steamed and eaten with salted butter. Baby corn is used as a vegetable. Corn also contains lysine, an essential amino acid. There are some high lysine corn in cultivation. Corn is also an important source of edible oil called corn oil which is used world wide. Corn flour is also used as a thickening agent in food preparation. Corn chips is also a popular snack food.

<b>Corn Varieties</b>		
<b>1</b>	<p><b>Baby corn (Chinese baby corn)</b></p> <p>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.</p>	
<b>2</b>	<p><b>Popcorn</b></p> <p>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.</p>	
<b>3</b>	<p><b>Purple corn (Maiz morado)</b></p> <p>Peruvians use this to make beautiful purple drinks and puddings.</p>	
<b>4</b>	<p><b>Indian Corn</b></p> <p>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.</p>	








<b>5</b>	<p><b>Nixtamal (uncooked posole)</b></p> <p>This is made with dried corn that's been simmered in a solution of lime and water. This loosens the hulls from the corn kernels and makes the kernels softer and more nutritious. Mexican cooks grind nixtamal into masa, which they use to make tortillas, the Mexican version of chappatis.</p>	
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### 9.3.4 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.



<b>Oat Varieties</b>		
<b>1</b>	<p><b>Instant oats (instant oatmeal)</b></p> <p>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.</p>	
<b>2</b>	<p><b>Oat groats</b></p> <p>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.</p>	
<b>3</b>	<p><b>Quick oats</b></p> <p>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.</p>	



4	<p><b>Rolled oats (oatflakes)</b></p> <p>These are oat groats that are steamed, rolled, and flaked so that they cook quickly. They're often cooked as a breakfast cereal, added raw to granola or muesli mixes, or used to make oatmeal cookies. Regular rolled oats take about five minutes to cook.</p>	
5	<p><b>Steel-cut oats</b></p> <p>These are groats that have been chopped into small pieces. They're chewier than rolled oats and often preferred for hot oatmeal cereals and muesli.</p>	

### 9.3.5 Barley

Barley's been feeding humans for millennia, though it fell out of favor during the last one as people came to see it as low-brow peasant fare. It is most often used in soups and stews, where it serves as both a puffy grain and a thickener, but it also makes a nice side dish or salad. At most markets, you'll have to choose between two types of barley. Hulled barley is the most nutritious, since only the tough outer hulls are polished off. Pearl barley is polished some more, so that the outer bran layer is also scrubbed off. It is less nutritious, but more popular since it's not as chewy as hulled barley and it cooks faster.




Barley is also the most important ingredient in beer making universally. Malted barley is fermented to produce refreshing nutritive beer with hops. Both honey coloured clear liquid beer and a stronger black colour stout is prepared. Unfermented sweet barley malt is also a popular drink. Barlet water is also known to have diuretic properties.




Barley Varieties		
1	<p><b>Hulled barley (barley groats)</b></p> <p>This is the least processed form of barley, with just the outermost hull removed. While it's chewier and slower to cook than more processed forms of barley, it's rich in fiber.</p>	
2	<p><b>Pearl barley (pearled barley)</b></p> <p>This is the most common form of barley, but not the most nutritious. While hulled barley loses only the thick outer hull in the milling process, pearl barley is stripped of the nutritious bran layer as well, leaving just the "pearl" inside. Despite this, it's still fairly nutritious. It</p>	

	takes about an hour to cook.	
<b>3</b>	<p><b>Quick-cooking barley</b></p> <p>This is similar to pearl barley in taste and nutrients, but it only takes about 10 minutes to cook since it's been pre-steamed. It's often served either hot as a side dish or cold in a salad.</p>	
<b>4</b>	<p><b>Sprouting barley</b></p> <p>This is unrefined barley, used for making barley sprouts. Don't try to cook with it--it's got a very thick hull.</p>	

### 9.3.6 Other Cereals

Other Cereals that are important in some places, but that have little production globally include:

Other Cereals		
<b>1</b>	<p><b>Buckwheat</b></p> <p>Buckwheat is loaded with nutrients, especially protein, and it has a nutty, earthy flavor. It's most commonly ground into a dark, gritty flour and used to make everything from pancakes to soba noodles. Some Buckwheat varieties are Buckwheat grits, buckwheat groats, kasha.</p>	
<b>2</b>	<p><b>Rye</b></p> <p>Rye isn't as nutritious as other grains, but it's hardy enough to grow in very cold climates. This has made it a staple of Northern Europeans, who use it to make breads, crackers, and whiskey. It has a distinctive, hearty flavor that's best when combined with other assertive ingredients. Some rye varieties are rye berries, rye flakes etc.</p>	
<b>3</b>	<p><b>Triticale</b></p> <p>Triticale is a wheat-rye cross that's higher in protein than either of its parents. It has a pleasant enough wheat-like flavor, but it's prized mostly for its hardiness and ability to grow in poor soils.</p>	

<b>4</b>	<p><b>Black Quinoa</b></p> <p>Quinoa cooks quickly, has a mild flavor, and a slightly crunchy texture. Rinse off its bitter coating before using.</p>	
<b>5</b>	<p><b>Pearl Millet</b></p> <p>Unhulled millet is widely used as birdseed, but many health food stores carry hulled millet for human consumption. It's nutritious and gluten-free, and has a very mild flavor that can be improved by toasting the grains.</p>	
<b>6</b>	<p><b>Ragi</b></p> <p>It is a ting round seeded mustard like grain which is ground into a powder and used in the production of porridge. Ragi malt is also a popular high protein, high energy diet.</p>	

#### 9.4 PULSES

Pulses are annual leguminous crops yielding from one to 12 grains or seeds of variable size, shape and colour within a pod. They are used for both food and feed.

The term "pulses" is limited to crops harvested solely for dry grain, thereby excluding crops harvested green for food (green peas, green beans, etc.) which are classified as vegetable crops. Also excluded are those crops used mainly for oil extraction (e.g. soybean and groundnuts) and leguminous crops (e.g. seeds of clover and alfalfa) that are used exclusively for sowing purposes. Both clover and alfalfa are excellent forage crops for animal feeding.

Pulses contain carbohydrates, mainly starches (55-65 percent of the total weight); proteins, including essential amino acids (18 - 25 percent, much higher than cereals); and fat (1 - 4 percent). The remainder consists of water and inedible substances. Many also contain harmful alkaloids. Legume crops also fix atmospheric nitrogen and enrich the soil where grown.

#### 9.5 VARIETIES OF PULSES

Food and Agricultural Organization (FAO) of the United Nations recognizes 11 primary pulses. The pulses which are widely used are discussed below:






##### **9.5.1 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.

Dry beans will keep indefinitely if stored in a cool, dry place, but as time passes, their nutritive value and flavor degrade and cooking times lengthen. Dried beans are almost always cooked by boiling, often after having been soaked for several hours. While the soaking is not strictly necessary, it shortens cooking time and results in more evenly textured beans. In addition, discarding one or more batches of soaking water leaches out hard-to-digest complex sugars that can cause flatulence. There are several methods including overnight soaking, and the power soak method, which is to boil beans for three minutes, then set them aside for 2-4 hours, then drain and discard the water and proceed with cooking.

Common beans take longer to cook than most pulses: cooking times vary from one to four hours but are substantially reduced with pressure cooking. The traditional spice to use with beans is epazote, which is also said to aid digestion.

Dry beans may also be bought pre-cooked and canned as refried beans, or whole with water, salt, and sometimes sugar.

Dry Beans Varieties		
1	<p><b>Black bean</b></p> <p>These beans are a staple of Latin American and Carribbean cuisine, where they're used to make side dishes, soups, bean dips, and salads. They have a strong, earthy flavor, so they're often combined with assertive flavorings.</p>	
2	<p><b>White kidney bean (Fazolia bean)</b></p> <p>It is used in Italian dishes in minestrone soup or bean salads. It's prized for its smooth texture and nutty flavor.</p>	
3	<p><b>Fava bean (butter bean)</b></p> <p>These meaty, strongly flavored beans have been around for ages, and they work well in sides dishes, soups, or salads. The larger ones are the best.</p>	
4	<p><b>Flageolet (pronounced: flah-joh-LAY)</b></p> <p>The French make good use of this small, creamy bean, often serving it with lamb.</p>	
5	<p><b>Lablab bean</b></p> <p>These beans can be brown, reddish-brown, or cream colored, and they're easily identified by a white seed scar which runs along one edge. They have a pleasant nutty flavor, but they need to be soaked</p>	

	and peeled before cooking.	
<b>6</b>	<p><b>Mung bean (green gram)</b></p> <p>Whole mung beans are small and green, and they're often sprouted to make bean sprouts. The sprouts are crunchy and are used in salads or in snack foods.</p>	
<b>7</b>	<p><b>Rattlesnake Bean</b></p> <p>The rattlesnake bean gets its name from the way its bean pods twist and snake around the vines and poles. These beans are good for making chili, refried beans, soups, or casseroles.</p>	
<b>8</b>	<p><b>Red Kidney Bean (rajma)</b></p> <p>These attractive and versatile beans are often used in chili, refried beans, soups, and salads.</p>	

### 9.5.2 Dry Broad Beans

Broad beans are eaten while still young and tender, enabling harvesting to begin as early as the middle of spring for plants started under glass or over-wintered in a protected location, but even the main crop sown in early spring will be ready from mid to late summer. Horse beans, left to mature fully, are usually harvested in the late autumn.



Figure 9.1 Dry Broad Bean

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").

Broad beans are rich in tyramine, and thus should be avoided by those taking monoamine oxidase inhibitors. The different varieties of dry broad bean are: Horse bean, Broad bean and Field bean.

### 9.5.3 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. This crop is considered to be the best crop for the



purpose of nitrogen fixing of the soil as it converts nitrogen into nitrogen nodules in large numbers, making the soil fertile. Two types of dry pea are cultivated – dry green cotyledon and dry yellow cotyledon.



Figure 9.2 Dry Peas

Pea is one of the most popular food crops in the world as they are very nutritious and also an easy to grow crop. Peas are excellent source of proteins, carbohydrates and other vitamins. The most commonly used peas are Garden pea and Protein pea.

#### 9.5.4 Chickpea

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



Figure 9.3 Chickpea

Chickpeas are a helpful source of zinc, folate and protein. They are also very high in dietary fiber and hence a healthy source of carbohydrates for persons with insulin sensitivity or diabetes. Chickpeas are low in fat and most of this is polyunsaturated.

There are two main kinds of chickpea:

1. Desi, which has small, darker seeds and a rough coat, cultivated mostly in the Indian subcontinent, Ethiopia, Mexico and Iran.
2. Kabuli, which has lighter coloured, larger seeds and a smoother coat, mainly grown in Southern Europe, Northern Africa, Afghanistan and Chile. It was also

introduced during the 18th century to the Indian subcontinent)

### 9.5.5 Dry Cowpea

Dry cowpea also called black-eyed pea or blackeye bean or China bean or Southern pea is originally from China. These chewy peas were common fare on slave plantations. They're still popular in the South, where they're traditionally eaten on New Year's Day or combined with rice and sausage to make Hoppin' John. They don't need soaking and cook fairly quickly. If overcooked they get mushy.



Figure 9.4 Dry Cowpea

### 9.5.6 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 digestability of dried pigeon peas via the reduction of indigestible sugars that would otherwise remain in the cooked dried peas.

In India, split pigeon peas (toor dal) are one of the most popular pulses along with chickpeas (chana), urad and mung. It is also called 'tuvara parippu' in Kerala. In south India a popular dish sambhar is made with this. Dal is also made with pigeon peas.



Figure 9.5 Pigeon Pea

Pigeon peas are nutritionally important, as they contain high levels of protein and the important amino acids methionine, lysine, and tryptophan. In combination with cereals, pigeon peas make a well-balanced human food.




### 9.5.7 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 flavor, and they're best if cooked with assertive flavorings. A variety of lentils exist with colors that range from yellow to red-orange to green, brown and black. Red, white and yellow lentils are decorticated, i.e. they have their skins removed.

Lentils are used to prepare an inexpensive and nutritious soup all over Europe and North and South America, sometimes combined with some form of chicken or pork. They are frequently combined with rice, which has a similar cooking time. A lentil and rice dish is referred to in the Middle East as mujaddara or mejadra. Rice and lentils are also cooked together in khichdi, a popular Indian dish. A large percentage of Indians are vegetarian and lentils have long been part of the indigenous diet as a common source of protein. Usually, lentils are boiled to a stew-like consistency with vegetables and then seasoned with a mixture of spices to make many side dishes such as sambar, rasam and dal, which are usually served over rice and roti.

Apart from a high level of proteins, lentils also contain dietary fiber, vitamin B1, and minerals. Red (or pink) lentils contain a lower concentration of fiber than green lentils (11% rather than 31%). The different varieties of lentils are given below:

Lentil Varieties		
1	<p><b>Red lentil</b></p> <p>The most common type of red lentil is the Red Chief. It's a lovely salmon pink in its dried form, but it turns golden when cooked. These lentils cook faster than others. They're best in purées or soups.</p>	
2	<p><b>Toor dal (tuvar dal)</b></p> <p>Whole toor lentils are yellow with tan jackets, but they're usually sold skinned and split. They have a mild, nutty flavor, and they're often cooked as a side dish or ground into flour.</p>	
3	<p><b>Urad dal (black lentil)</b></p> <p>These lentil-like beans have black skins covering creamy white interiors. Whole urad dal derive their strong, earthy flavor from the black skins and are often used in curries. Split urad dal retain the skins and also have a strong flavor. Skinned and split urad dal are creamy white and somewhat bland.</p>	

4	<p><b>Skinned and split black lentils</b></p> <p>These are black lentils (or urad dal) that have been split and skinned. They're much milder than unskinned</p>	
5	<p><b>Urad dal (split black lentils)</b></p> <p>These are black lentils (or urad dal) that have been split but not skinned. They're not as mild as white lentils, which have been split and skinned.</p>	
6	<p><b>French green lentils</b></p> <p>These choice lentils were originally grown in the volcanic soils of Puy in France, but now they're also grown in North America and Italy. They're especially good in salads since they remain firm after cooking and have a rich flavor. They cook a bit slower than other lentils.</p>	

### 9.5.8 Bambara Groundnut

Bambara (also spelled Bambarra) groundnut has many common names such as Congo groundnut, Congo goober, Madagascar groundnut, earth pea, baffin pea, voandzou, nzama (Malawi), and underground bean. Bambara groundnuts are also popularly known as jugo beans. Jugo bean is indigenous to West Africa but is now grown widely as a crop in the tropical regions of Africa.



Figure 9.6 Bambara Groundnut

The Bambara groundnut ripens its pods underground, much as the peanut (also called a groundnut). They can be eaten fresh or boiled after drying. The pods are round, wrinkled, and over ½ inch long. Each contains one or two seeds that are round, smooth, and very hard when dried. The seeds may be cream, brown, red, mottled, or black-eyed.

### 9.5.9 Lupin

The yellow legume seeds of lupins, commonly called lupin beans, were quite popular with the Romans and they spread the

cultivation of them throughout the Roman Empire; hence common names like lupini in Romanese languages. Lupin beans are commonly sold in a salty solution in jars (like olives and pickles) and can be eaten with or without the skin. Lupins are also cultivated as forage and grain legumes.



Figure 9.7 Lupin

Newly bred variants of sweet lupins are grown extensively in Germany; they lack bitter taste and require no soaking in salt solution. The seeds are used for different foods from vegan sausages to lupin-tofu or baking-enhancing lupin flour. Given that lupin seeds have the full range of essential amino acids and that they, contrary to soy, can be grown in more temperate to cool climates, lupins are becoming increasingly recognized as a cash crop alternative to soy. Lupin milk is a milk substitute made from lupin protein.

### CHECK YOUR PROGRESS

1. Fill in the blanks
  - i) Based on grain size, rice is classified into ....., ....., and .....
  - ii) Glutinous rice is used for making .....
  - iii) Japanese rice wine is called .....
  - iv) Two examples of scented rice are ..... and .....
  - v) Globally, production of ..... is first followed by ..... and third is .....
  - vi) Wheatflour with high gluten content is used for ..... and low gluten content is used for .....
  - vii) Soluble fibre present in oat grain is considered to reduce ..... in blood
2. What component in the wheat makes the dough rise?
3. What is bulgar and in what form are used?
4. What is the water soluble legume like protein in oats?

### 9.6 LET US SUM UP

Cereal crops or grains come from grass family cultivated for their edible grains or fruit seeds. The word 'cereal' derives from 'Ceres', the name of the pre-Roman goddess of harvest and agriculture.

The term "pulses" is limited to crops harvested solely for dry grain, thereby excluding crops harvested green for food (green peas, green beans, etc.) which are classified as vegetable crops. Also excluded are those crops used mainly for oil extraction (e.g. soybean and groundnuts) and leguminous crops (e.g. seeds of clover and alfalfa) that are used exclusively for sowing purposes as forage crops as animal feeds.

Pulses contain carbohydrates, mainly starches (55 - 65 percent of the total weight); proteins, including essential amino acids (18 - 25 percent, and much higher than cereals); and fat (1 - 4 percent). The remainder consists of water and inedible substances. Food and Agricultural Organization (FAO) of the United Nations recognizes 11 primary pulses.

### 9.7 LESSON END ACTIVITY

1. Write in your mother tongue / regional language the name of the following cereals and pulses: Rice, Wheat, Corn, Millet, Urad dal, Moong dal, Tuvar dal

### 9.8 KEY WORDS

<b>Kernel</b>	A grain or seed of a cereal grass, enclosed in a husk.
<b>Couscous</b>	A pasta of North African origin made of crushed and steamed semolina.
<b>Hulls</b>	The dry outer covering of a fruit, seed, or nut; a husk.
<b>Flatulence</b>	The presence of excessive gas in the digestive tract.
<b>Cotyledon</b>	A leaf of the embryo of a seed plant, which upon germination either remains in the seed or emerges, enlarges, and becomes green.
<b>Decorticated</b>	To remove the bark, husk, or outer layer from; peel, shell.

### 9.9 QUESTIONS FOR DISCUSSION

1. Name a few speciality rices and indicate how they are used.
2. Distinguish between pulses and vegetable peas.
3. Name five cereals and indicate briefly how they are used.
4. Name three important tubers which are used as food.
5. Name three important cereals grown world wide as staple food.
6. Name two cereals which also produce edible oil.

### CHECK YOUR PROGRESS - ANSWER

1.
  - i) long grain, medium grain, short grain
  - ii) desserts
  - iii) Saké
  - iv) Scented Basumati, Jasmine Rice
  - v) maize, wheat, rice
  - vi) bread, biscuit
  - vii) cholesterol
2. Gluten
3. Bulgar wheat which is soaked and baked. Cracked into coarse, medium or fine and used as food or side dish.
4. Avanalin

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## LESSON 10

### YOGHURTS AND CREAMS

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#### 10.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Yohurts and its varieties
- Creams and type of cream
- Storage of creams

#### 10.1 INTRODUCTION

Fermentation is one of the oldest methods practiced by human beings for the transformation of milk into products with an extended shelf life. The exact origin(s) of the making of fermented milks is difficult to establish, but it could date from some 10 – 15 thousand years ago as the way of life of human beings changed from being food gatherers to food producers. This change also included in the domestication of crops and animals that the transition occurred at different times in different parts of the world. Archaeological evidence shows that some civilizations were all

advanced in agricultural and animal husbandry methods and in the production of fermented milks such as yoghurt.

Although there are no records available regarding the origin of yoghurt, the belief in its beneficial influence on human health and nutrition existed in many civilizations over a long period of time.

Cream is also a dairy product that is composed of the higher-butterfat layer skimmed from the top of milk before homogenization. In un-homogenized milk, over time, the lighter fat rises to the top. In the industrial production of cream this process is accelerated by using centrifuges called "separators". In many countries, cream is sold in several grades depending on total butterfat content. Cream can be dried to a powder for shipment to distant markets.

## 10.2 YOGHURT

**Yoghurt** or **yogurt** is a dairy product produced by bacterial fermentation of milk. Fermentation of the milk sugar (lactose) produces lactic acid, which acts on milk protein to give yoghurt its texture and its characteristic tang. Yoghurt can be made from sheep's, cows, goats or even Soya milk (called soy yogurt).

The word "yoghurt" comes from the Turkish *yo urt*. The word is derived from the adjective *yo un*, which means "dense" and "thick", or from the verb *yo urmak*, meaning "to knead". Originally, the verb may have meant "to make dense", which is how yoghurt is made.

Yoghurt is made by introducing specific bacteria strains into milk, which is subsequently fermented under controlled temperatures and environmental conditions (inside a bioreactor), especially in industrial production. The bacteria ingest natural milk sugars and release lactic acid as a waste product. The increased acidity causes milk proteins to tangle into a solid mass (curd in a process called denaturation). The increased acidity (pH=4–5) also prevents the proliferation of potentially pathogenic bacteria. Pasteurised products, which have no living bacteria, are called fermented milk (drink).

### **Nutritional Value:**

Natural whole milk yogurt has a similar nutritional value to whole boiled milk, being rich in protein and minerals, especially calcium and phosphorus. Low fat and fat free yogurts are made from skimmed milk powder; they have a slightly higher carbohydrate and protein content than whole milk yogurts. The bonus is that protein, calcium and phosphorus are more easily absorbed from yogurt than from milk as they are partially digested during the fermentation process.

Yogurt can be helpful in restoring the digestive tract to its normal condition after a course of antibiotics, which are liable to indiscriminately destroy all intestinal bacteria, both good and bad.



Yoghurt also has medical uses, in particular for a variety of gastrointestinal conditions and in preventing antibiotic-associated diarrhea.

### 10.3 VARIETIES OF YOGHURTS

There are different varieties of yoghurts. Some commonly used yoghurt are discussed below:

#### 10.3.1 Strained Yoghurt

Strained yoghurt is yoghurt which has been strained in a cloth or paper bag or filter, traditionally made of muslin, to remove the whey, giving a consistency between that of yoghurt and cheese, while preserving yoghurt's distinctive sour taste. It is a traditional food in the Middle East and South Asia, where it is often used in cooking, as it is high enough in fat not to curdle at higher temperatures. Like many yoghurts, strained yoghurt is often made from milk which has been enriched by boiling off some of the water content, or by adding extra butterfat and powdered milk.

Strained yoghurt is used in both savoury and sweet dishes, both cooked and raw. In the Middle East and South Asia, it is often used to enrich savoury sauces, as it does not curdle when cooked like unstrained yoghurt. It is used raw in savoury sauces and dips and in sweet desserts.

##### 10.3.1.1 Types of Strained Yoghurt

###### **Greek Strained Yoghurt:**

Greek yoghurt is traditionally made from ewe's milk; nowadays, cow's milk is often used, especially in industrial production. Strained yoghurt is used in Greek food mostly as a dessert, where honey, sour cherry syrup, spoon sweets, and the like are often served on top. A few savoury Greek dishes use strained yoghurt.

###### **Dahi:**

Dahi is yoghurt of the Indian subcontinent, known for its characteristic taste and consistency.

- A typical preparation, a dessert called shrikhand, is made with the yoghurt placed in a soft cloth with very fine holes, which is hung to drain for a few hours while all the water drains out. Sugar, saffron, cardamom, diced fruit and nuts may then be mixed in for taste.
- A special Indian preparation called raita involves adding grated cucumber or grated bottle gourd and spices. In South India, the preparation involves using tomato, cucumber, onion, spinach, radish or snakegourd with cashew nuts or poppy seeds ground along with coconut.

- In South India, it is common for people to eat rice mixed with plain yoghurt or buttermilk as the last course in a meal.
- Dahi chutney (curd, green chillies & onions) is an accompaniment of the popular Hyderabadi biryani.

### **Bulgarian Yoghurt:**

Bulgarian yoghurt commonly consumed plain, is popular for its taste, aroma, and quality. The qualities arise from the *Lactobacillus bulgaricus* and *Streptococcus thermophilus* culture strains used in Bulgaria. It is also used to prepare Bulgarian milk salad.

### **Levant:**

Strained yoghurt or labneh is popular in the Levant. Besides being used fresh, labneh is also dried then formed into balls, sometimes covered with herbs or spices, and stored in olive oil. Labneh is a popular mezze dish and sandwich ingredient. The flavour depends largely on the sort of milk used: labneh from cow's milk has a rather milder flavour.

### **10.3.2 Dadiah or Dadih**

Dadiah is a Traditional Minangkabau water buffalo yogurt which is fermented in bamboo container covered with banana leaf. Dadih is usually eaten for breakfast, mixed together with ampiang (traditional rice krispies) and coconut sugar. Dadih can also be eaten with hot rice and sambal.

### **10.3.3 Tarator**

Taratur or tartor is a cold soup (or a liquid salad), popular in the summer time in Albania and the Republic of Macedonia. It is made of yoghurt, cucumbers, garlic, walnuts, dill, vegetable oil, and water. It is best served chilled or even with ice. The cucumbers may, on very rare occasions, be replaced with lettuce or carrots.

### **10.3.4 Labneh Yoghurt**

Labneh yoghurt of Lebanon is a thickened yoghurt used for sandwiches. Olive oil, cucumber slices, olives, and various green herbs may be added. It can be thickened further and rolled into balls, preserved in olive oil, and fermented for a few more weeks. It is sometimes used with onions, meat, and nuts as a stuffing for a variety of Lebanese pies or Kebbeh balls.

### **10.3.5 Rahmjoghurt**

Rahmjoghurt is a creamy yoghurt with much higher milkfat content (10%) than most yoghurts offered in English-speaking countries, is available in Germany and other countries.

### 10.3.6 Caspian Sea Yoghurt

This yoghurt variety, called Matsoni, is started with *Lactococcus lactis*. It has a unique, viscous, honey-like texture. It is milder in taste than other varieties of yoghurts. Ideally, Caspian Sea yoghurt is made at home because it requires no special equipment nor unobtainable culture. It can be made at room temperature (20–30°C) in 10 to 15 hours.

### 10.3.7 Jameed

Jameed is yoghurt which is salted and dried to preserve it. It is popular in Palestine and Jordan.

## 10.4 CREAMS

Cream is the fat that rises to the top of whole milk. It has a smooth, satiny texture and is labeled according to its butterfat content (heavy to light).

Creams are usually labeled "pasteurized" or "ultra-pasteurized". Ultra pasteurized creams have a longer shelf life than pasteurized creams, but taste is affected (some say it has a cooked flavor). For superior taste, although it can be hard to find, buy 'pasteurized' not 'ultra pasteurized' cream.

### 10.4.1 Types of Cream

Cream is made by separating milk into fat-rich cream and almost fat-free (skimmed) milk. This is usually done by centrifugal force. There are many varieties of cream, categorized according to the amount of milk fat in it:

#### **Light Cream:**

Light cream also called coffee or table cream, can contain anywhere from 18 to 30 percent fat, but commonly contains 20 percent. It can not be whipped.

#### **Whipping Cream:**

Whipping cream contains 30 to 36 percent milk fat and sometimes stabilizers and emulsifiers. Whipping cream will double in volume when whipped. Good for fillings but does not hold up well for piping.

#### **Whipped Cream:**

Whipped cream in pressurized cans is a mixture of cream, sugar, stabilizers, emulsifiers and gas, such as nitrous oxide. It is expanded by the gas into a "puffy" form. Aerosol "dessert toppings," which are usually made with hydrogenated vegetable oils, have absolutely no cream in them (and doesn't taste like cream either).

### **Heavy Cream:**

Heavy cream also called heavy whipping cream, is whipping cream with a milk fat content of between 36 and 40 percent. Heavy cream is used for filling and decorating pastries. It's usually only available in specialty or gourmet markets.

### **Half-and-Half:**

Half and half is a mixture of equal parts milk and cream, and contains 10 to 12 percent milk fat, and can not be whipped. Mainly used in beverages.

### **Single Cream:**

Single cream has a 20% butterfat content and is used in both sweet and savory cooking.

### **Double (Rich) Cream:**

Double (rich) cream has a 48% butterfat content and can be whipped and is also used in pies and sauces.

### **Clotted Cream (Devonshire or Devon Cream):**

Clotted cream is a thick, rich, yellowish cream with a scalded or cooked flavor that is made by heating unpasteurized milk until a thick layer of cream sits on top. The milk is cooled and the layer of cream is skimmed off. Clotted cream has 55-60 percent fat content and is so thick it does not need whipping.

### **Crème Fraîche:**

*Crème* is pronounced 'krem fresh'. It is a thick and smooth heavy cream with a wonderfully rich and velvety texture. This matured cream has a nutty, slightly sour taste produced by culturing pasteurized cream with a special bacteria. The butterfat content varies (usually 30%), as there is no set standard so you will find every brand tastes a little differently. *Crème fraîche* is used in both sweet and savory dishes. Makes a wonderful topping for fresh berries, cobblers and puddings.

## **10.4.2 STORAGE OF CREAM**

- All creams, unless ultrapasteurized (briefly heated to 149°C / 300°F and then cooled), is highly perishable and should be kept in the coldest part of the refrigerator.
- Cream should be kept in the container in which it is delivered.
- Cream should be kept covered as it easily absorbs smells from other foods, such as onion and fish.
- Fresh cream should be ordered daily.

- Tinned cream should be stored in cool, dry ventilated rooms.
- Frozen cream should only be thawed as required and not refrozen.

### CHECK YOUR PROGRESS

1. What are the raw materials used in making yoghurt?
2. What is raita and how it is prepared?
3. How is cream prepared?

### 10.5 LET US SUM UP

**Yoghurt** or **yogurt** is a dairy product produced by bacterial fermentation of milk. Fermentation of the milk sugar ( lactose) produces lactic acid, which acts on milk protein to give yoghurt its texture and its characteristic tang. Yogurt can be made from sheep's, cows, goats or even Soya milk (called soy yogurt).

Natural whole milk yogurt has a similar nutritional value to whole boiled milk, being rich in protein and minerals, especially calcium and phosphorus.

Cream is also a dairy product that is composed of the higher-butterfat layer skimmed from the top of milk before homogenization. In un-homogenized milk, over time, the lighter fat rises to the top. In the industrial production of cream this process is accelerated by using centrifuges called "separators".

All cream, unless ultrapasteurized (briefly heated to 149°C / 300°F and then cooled), is highly perishable and should be kept in the coldest part of the refrigerator

### 10.6 LESSON END ACTIVITY

1. Prepare and note down the characters of few yoghurts and creams, taste them and record your observations.
2. Prepare raita and note down its taste.
3. Prepare a few dishes making use of yoghurt and cream.

### 10.7 KEY WORDS

**Homogenization** Emulsions usually consist of a suspension of globules of varying size. Homogenization reduces these globules to a smaller and more uniform size. In homogenized milk the smaller globules adsorb more of the protein, which acts as a stabilizer, and the cream does not rise to the top.

<b>Centrifuges</b>	A machine that exerts a force many thousand times that of gravity, by spinning. Commonly used to clarify liquids by settling the heavier solids in a few minutes, a process that might take several days under gravity. Liquids of different density can also be separated by centrifugation, e.g. cream from milk. When centrifuged heavier particles migrate towards the centre and the lighter particles move towards the periphery.
<b>Denaturation</b>	Biochemical process modifying a protein's natural configuration.
<b>Pathogenic</b>	Capable of causing disease.
<b>Diarrhea</b>	Excessive and frequent evacuation of watery feces, usually indicating gastrointestinal distress or disorder.
<b>Skim</b>	To remove the top layer from a liquid, such as cream from milk or foam and fat from stock, soups, sauces, etc.

#### 10.8 QUESTIONS FOR DISCUSSION

- 1) What is the difference between yoghurt and cream?
- 2) What are the different types of yoghurt in use?
- 3) Name the different types of creams in use.

#### CHECK YOUR PROGRESS - ANSWER

1. Yoghurt is made from cow's milk, sheep's milk, goat's milk and soyabean milk.
2. Yoghurt is mixed with cucumber, spinach, radish or snakeguard and tomato with cashew nuts or poppy seeds and ground along with milk.
3. Usually by centrifuging milk which produces fat rich cream and almost fat free skimmed milk.

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## LESSON 11

### VEGETABLES, FRUITS AND NUTS

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11.9	Let us Sum Up
11.10	Lesson End Activity
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#### 11.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Vegetables and their types
- Methods of cooking vegetables
- Fruits and their types

➤ Nuts and varieties of nuts

## 11.1 INTRODUCTION

"Eat your fruits and vegetables" is one of the tried and true recommendations for a healthy diet. Increasing consumption of fruit and vegetables can significantly reduce the risk of many chronic diseases.

Any herbaceous plant or plant part which is regularly eaten as food by humans would normally be considered to be a vegetable. Vegetables are very often eaten cooked. Some, such as potato, are never eaten raw, but many such as carrots, bell peppers and celery are quite commonly eaten either raw or cooked.

Vegetables are brimming and overflowing with fibre, and also a whole range of vitamins, anti-oxidants, minerals and many other protective ingredients, and are also low in calories.

Fruits are the matured ovaries of flowers, containing the seeds for the next generation of plants. Many plants cunningly make their fruits sweet, the better to attract animals like us to eat them and disperse the seeds. Fruits are often delicious enough to eat out of hand, but they can also be made into tarts, compotes, shakes, juices, preserves, liqueurs, and many other things.

A nut in cuisine is a much less restrictive but vital. Any large, oily kernel found within a shell and used in food may be regarded as a nut. Because nuts generally have high oil content, they are a highly prized food and energy source. A large number of seeds are edible and used in cooking, eaten raw, sprouted, or roasted or deep fried in oil for use as a snack food, or pressed for oil that is used in cookery.

## 11.2 VEGETABLES

The term "vegetable" generally refers to the succulent edible part of a plant. The definition is traditional rather than scientific. It is somewhat arbitrary and subjective, as it is determined by individual cultural customs of cooking and food preparation.

Mushrooms, though belonging to the biological kingdom Fungi, are also loosely considered as vegetables. In general, vegetables are regarded by cooks as being most suitable for savory or salted dishes, rather than sweet dishes, although there are many exceptions, such as pumpkin pie, etc.

Vegetables are a catch-all category that includes many of the edible parts of a plant, like stems, roots, flowers, and leaves. We don't usually consider the fruits of a plant to be vegetables, except for fruits that aren't very sweet. Tomatoes, squash, peppers, eggplants, and beans, for example, are all fruits, but we usually refer to them as vegetables.




Nuts, seeds, grains, herbs, and spices are not normally considered to be vegetables, even though they are all parts of plants.




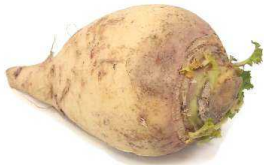



### 11.3 TYPES OF VEGETABLES

The market is flooded with different types of vegetables, each belonging to a distinctive vegetable group. Availability of vegetables also differ from season to season, as in what you can find in winter season, that won't be available during summers in the temperate countries. However, all types of vegetables may be available throughout the year in tropic and sub-tropic countries. There are some vegetables that can be eaten raw in the form of salad like tomato, cucumber etc. And as it is said, variety is the spice of life; so savor the taste of the distinctive types of veggies bestowed on us by nature. Here is a list of different kinds of vegetables:

#### 11.3.1 Root Vegetables


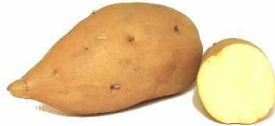

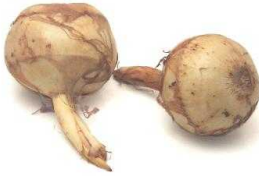

Root vegetables are rich in nutrients, low in fat and calories, inexpensive and usually available throughout the year. Beyond that, they have wildly varying characteristics. Radishes are pungent, carrots sweet, beets earthy. Others, like parsnips, turnips, and rutabagas, have more subtle flavors. Root vegetables will last awhile in your pantry, and even longer in your refrigerator.

ROOT VEGETABLES		
<b>1</b>	<p><b>Beetroots</b></p> <p>Beets have a distinctive earthy flavor that's enhanced by roasting, but they can also be steamed, microwaved, or boiled. Varieties include the familiar red beets, golden beets, white beets, and chioggia, candy cane beets and Baby beets.</p>	
<b>2</b>	<p><b>Black radish</b></p> <p>These large, pungent radishes have black peels and white interiors, they can be fashioned into attractive garnishes, or they can be cooked like turnips. They can also be served raw.</p>	
<b>3</b>	<p><b>Carrot</b></p> <p>Raw or cooked, carrots add sweetness and color to stews, soups, stir-fries, slaws, cakes, and crudité platters, plus they're a great source of carotenoids (Vitamin A).</p>	

<p><b>4</b></p>	<p><b>Daikon</b> (pronounced <b>DIE-kon</b>)</p> <p>Daikon is larger and milder than its relative, the red radish. The Japanese like to grate it and serve it with sushi or sashimi, pickle it, stir-fry it, or slice it into salads.</p>	
<p><b>5</b></p>	<p><b>Radish</b></p> <p>With their crisp texture and peppery flavor, raw radishes are great in salads and on crudité platters. They can also be cut into attractive garnishes. Select firm, fresh-looking radishes and store them in your refrigerator for no more than a week.</p>	
<p><b>6</b></p>	<p><b>Turnip</b></p> <p>Turnips can be roasted, boiled, steamed, or stir-fried.</p>	
<p><b>7</b></p>	<p><b>Rutabaga</b> (pronounced: <b>roo-tuh-BAY-guh</b>)</p> <p>Rutabagas look like turnips, only they're a bit larger and have a yellow complexion.</p>	
<p><b>8</b></p>	<p><b>Salsify</b> (pronounced: <b>SAL-suh-fee</b>)</p> <p>When cooked, salsify has the taste and texture of an artichoke heart. There are two types: white salsify and black salsify. After peeling salsify, put it into acidulated water right away to prevent it from turning brown. Canned salsify is a good substitute for fresh, but it's hard to find.</p>	
<p><b>9</b></p>	<p><b>Lotus root</b></p> <p>Slices of the lotus root have a beautiful pattern. The fresh version is available sporadically; if not, the canned version is almost as good. Rinse and drain before using using the contents in the can.</p>	
<p><b>10</b></p>	<p><b>Parsnip</b></p> <p>These are like carrots, except that they're cream-colored and never served raw. Northern Europeans like to add them to stews, but they can also be puréed or served as a side dish.</p>	






### 11.3.2 Tubers & Corms

Technically, tubers and corms are swollen underground stems of plants. It is easier to think of them as the "family of potato-like vegetables." They're used worldwide as a source of carbohydrates, often taking a back seat to more flavorful and colorful ingredients.

<b>TUBERS &amp; CORMS</b>	
<p><b>1 Potato</b></p> <p>Potatoes can be boiled, baked, fried, microwaved, steamed, or roasted, with or without their peels. They're often paired with butter, sour cream, or oil, but left to themselves they're quite low in calories and loaded with nutrients.</p>	
<p><b>2 Sweet potato</b></p> <p>Sweet potatoes are quite versatile, but they're most often baked, candied, or made into pies. It's best not to boil them, as they'll lose much of their flavor. They are usually sweet to taste.</p>	
<p><b>3 Topical yam</b></p> <p>These firm, white-fleshed yams are widely used in tropical countries. They're somewhat bland and dry, so they're often served with spicy sauces.</p>	
<p><b>4 Arrowroot</b></p> <p>The name arrowroot is more commonly associated with a thickener that's made from the plant. A fresh arrowroot tuber looks like a small onion, only without the layers. It should be peeled, and then it can be boiled or stir-fried.</p>	
<p><b>5 Cassava (pronounced kuh-SAH-vuh)</b></p> <p>There's both a sweet and a bitter variety of cassava. The sweet one can be eaten raw, but the bitter one requires cooking to destroy the harmful prussic acid it contains. Cassava is a rich source of industrial starch and energy rich animal feed.</p>	

### 11.3.3 Stalk Vegetables

Edible plants whose stems are consumed like vegetables; the leaves of some varieties are also edible.






<b>STALK VEGETABLES</b>	
<p><b>1 Asparagus</b></p> <p>Asparagus has a wonderfully distinctive flavor and a meaty texture. It's often served as a side dish, after being steamed or briefly boiled. These are shoots that arise from underground rhizomes. Two types of asparagus are available commercially: white or green asparagus and are expensive.</p>	
<p><b>2 Bamboo shoots</b></p> <p>These fresh shoots are boiled first to rid them of hydrocyanic acid, a toxin that causes cyanide poisoning. Canned shoots are safer and more widely available and used in salad dishes. It is considered as a delicacy and is expensive.</p>	
<p><b>3 Celery</b></p> <p>Raw celery is flavorful and wonderfully crunchy, and it's a great vehicle for dips or fillings like peanut butter or cream cheese. Celery can also be sautéed and used to flavor soups, stews, and sauces. A bunch or stalk of celery consists of a dozen or so individual ribs, with the tender innermost ribs called the celery heart.</p>	
<p><b>4 Chinese celery</b></p> <p>This has a stronger flavor than ordinary celery, and it's often used in stir-fries and soups.</p>	
<p><b>5 Hearts of palm (palmitos)</b></p> <p>These are peeled cabbage palm buds, and they're terrific in salads or as a vegetable side dish. Commercially important source is pejobaye palm of the Amazon basin. Very expensive. Usually available in canned form.</p>	









### 11.3.4 Bulbs

A bulb is an underground vertical shoot that has modified leaves (or thickened leaf bases) that are used as food storage organs by a dormant plant.

A bulb's leaf bases generally do not support leaves, but contain food reserves to enable the plant to survive adverse conditions. The leaf bases may overlap and surround the center of the bulb as with the onion. A modified stem forms the base of the bulb, and plant growth occurs from this basal plate. Roots emerge from the underside of the base, and new stems and leaves from the upper side.








BULBS		
1	<p><b>Green onion</b></p> <p>These are onions have small bulbs and long green stalks. They're usually eaten raw, but can also be grilled or sautéed.</p>	
2	<p><b>Leek</b></p> <p>Leeks look like large green onions, and they have a more complex onion flavor. They're often cooked as a vegetable side dish, or used in soups.</p>	
3	<p><b>Spring onion</b></p> <p>Some people use the name spring onion as a synonym for green onion, while others use it to refer to a green onion with a partially formed bulb.</p>	
4	<p><b>Ramps (Wild leek or Tennessee truffle)</b></p> <p>These have a strong onion-garlic flavor which tends to linger on the breath. Despite their humble Appalachian origins, ramps tend to be pricey and are usually found in gourmet produce markets. They're available from March to June.</p>	
5	<p><b>Dry Onions</b></p> <p>There are two categories of dry onions: storage onions and sweet onions. Storage onions are low in water and high in sulfur, so they store well and are available year-round. Sweet onions are usually available just from April to August.</p>	



<p><b>6</b></p>	<p><b>Boiling onion</b></p> <p>These are small versions of yellow, white, or red onions. They're up to two inches in diameter, and usually cooked whole.</p>	
<p><b>7</b></p>	<p><b>Shallot</b></p> <p>They have a more delicate, garlicky flavor than other cooking onions, and are a common ingredient in French sauces. Many people find them too hot to eat raw.</p>	
<p><b>8</b></p>	<p><b>Sweet onion</b></p> <p>These onions are mild and crisp, so they're the onions of choice for slicing raw on burgers and sandwiches. They can be lightly cooked, too, though they're not as pungent and flavorful as storage onions. There are several different varieties, often named after the region in which they're grown.</p>	
<p><b>9</b></p>	<p><b>White Onion</b></p> <p>These popular cooking onions are often called for in Hispanic dishes, since they have a cleaner, more tangy flavor than yellow onions.</p>	
<p><b>10</b></p>	<p><b>Garlic</b></p> <p>Almost every cuisine on our planet has found an important role for garlic. Europeans mince it raw and add it to salad dressings, or sauté it and use it to flavor their sauces. Asian cooks add it to their stir-fries; Indian cooks to their curries; Hispanic cooks to meats and vegetables. Americans have lately taken a fancy to roasting whole bulbs, and then spreading the garlic like a soft cheese on bread or crackers.</p>	
<p><b>11</b></p>	<p><b>Elephant Garlic</b></p> <p>This looks like an overgrown garlic, but it's more closely related to a leek. It's much milder than ordinary garlic, so it's a good choice if you want to impart the flavor of garlic to a delicately flavored dish. It's often sold in a mesh stocking to keep the cloves together.</p>	








### 11.3.5 Salad Greens

A variety of green leaves are used exclusively for salads. The salad greens popularly used are discussed below:

<b>SALAD GREENS</b>	
<p><b>1 Lettuce</b></p> <p>These are mild salad greens that are always served fresh, either in salads or as garnishes. There are four basic categories: iceberg lettuce, leaf lettuce, butterhead lettuce, and romaine lettuce, Lettuce leaves are very crisp and low in calorie.</p>	
<p><b>2 Lollo rosso</b></p> <p>This mild, tender lettuce has ruffled red edges.</p>	
<p><b>3 Radicchio</b> (pronounced: rah-DEEK-ee-oh)</p> <p>With its beautiful coloring and slightly bitter flavor, radicchio is wonderful when combined with other salad greens.</p>	
<p><b>4 Red mustard</b></p> <p>This has a pungent, peppery flavor that adds zip to salads.</p>	
<p><b>5 Mizuna (spider mustard)</b></p> <p>Mizuna has tender leaves and a pleasant, peppery flavor.</p>	
<p><b>6 Escarole (Batavian endive)</b></p> <p>Escarole has sturdy leaves and a slightly bitter flavor. Young escarole leaves are tender enough to add to salads, otherwise escarole is best cooked as a side dish or used in soups.</p>	
<p><b>7 Spring salad mix</b></p> <p>This is a mix of different young salad greens. Commercial mixes usually include arugula, mizuna, tat soi, frisee, oakleaf, red chard, radicchio, mustard greens, and radicchio.</p>	







### 11.3.6 Cooking Greens

Green leaves which are used for cooking are discussed below:

<b>COOKING GREENS</b>	
<p><b>1 Spinach</b></p> <p>Spinach is packed with nutrients, and it's quite versatile. You can toss it raw into salads, or cook it briefly to make a side dish or soup. Of the two main varieties, smooth leaf spinach or flat leaf spinach or salad spinach is more delicate and better suited to salads than curly leaf spinach. Some spinach are succulent and are slightly mucilaginous.</p>	
<p><b>2 Water spinach (Swamp spinach)</b></p> <p>This cooking green is very common in the Philippines. Some varieties have purple stems.</p>	
<p><b>3 Mustard greens</b></p> <p>There are red and green varieties, and both have a peppery bite. If the greens are too pungent they are tamed by blanching them in salted water.</p>	
<p><b>4 Callaloo</b></p> <p>These huge leaves are about a foot and a half long, and they're a popular vegetable among Pacific islanders and some Asians</p>	
<p><b>5 Broccoli raab</b></p> <p>This is slightly bitter cooking green. It's best to just eat the florets and leaves; the stems are quite bitter.</p>	
<p><b>6 Chrysanthemum leaves</b></p> <p>This Asian potherb is used to flavor salads, soups, sukiyaki and other dishes. The leaves are usually blanched briefly to soften them and deepen their color, but young leaves can be served raw.</p>	
<p><b>7 Kale</b></p> <p>Kale is a kind of cabbage with dark green, wrinkled leaves. It's prized more for its hardness than its flavor or delicacy.</p>	






### 11.3.7 Inflorescent Vegetables

Inflorescent vegetables are those vegetables whose flowers or flower buds of edible plants. Some commonly used inflorescent vegetables given are below.

INFLORESCENT VEGETABLES	
<p><b>1 Artichoke</b></p> <p>Artichokes are the unopened flowers and stems of a kind of thistle. At the center is the heart, the choicest portion of the artichoke, covered by the choke, a hairy pad that should be peeled off and discarded. Their peak season is early summer.</p>	
<p><b>2 Banana blossom</b></p> <p>These are popular in Southeast Asia and India, where they're boiled in water or coconut milk, then eaten like artichokes.</p>	
<p><b>3 Broccoflower</b></p> <p>This is a green variety of cauliflower.</p>	
<p><b>4 Broccoli</b> (<i>pronounced: BRAHK-uh-lee</i>)</p> <p>Broccoli is tasty, good for health and easy to cook. The florets can be steamed or boiled and served as a side dish, or served raw on a crudité platter, or stir-fried. The stems are good, too, but you should peel them first and cook them a little longer.</p>	
<p><b>5 Broccoli Romanesco</b></p> <p>This is similar to broccoli, but its florets resemble pine cones. It's especially good raw.</p>	
<p><b>6 Cauliflower</b></p> <p>Cauliflower florets often wind up in soups, or as a side dish smothered with a cheese sauce, or served raw on a crudité platter. Select heads that are heavy for their size. When cauliflower pieces are placed in hot water, all the worms present in the head will come out.</p>	

### 11.3.8 Cabbages





The many varieties of cabbage can be widely dissimilar, but most have a short, broad stem and leaves or flowers that form a compact head. The most common cabbages are green and red cabbage, collards, kohlrabi, broccoli, Brussels sprouts, cauliflower, and kale. They're loaded with vitamin C, fiber, and possibly cancer-fighting compounds to boot.

CABBAGES		
<b>1</b>	<p><b>Green cabbage</b></p> <p>Cabbage is quite versatile. You can cut it into chunks, boil it, and serve it with corned beef or other fatty meats. You can also use cooked leaves as wrappers for meat fillings, or shred raw ones for cole slaw. Select heavy heads of cabbage that have shiny leaves.</p>	
<b>2</b>	<p><b>Napa cabbage (michihli)</b></p> <p>Like bok choy, napa cabbage is a common ingredient in Asian stir-fries. It can also be used as a milder and more delicate alternative to green cabbage in slaws and other recipes.</p>	
<b>3</b>	<p><b>Red cabbage</b></p> <p>Red cabbage tastes just like green cabbage, so your choice between them depends largely on which color you prefer. One problem with red cabbage, though, is that the color tends to bleed and discolor surrounding foods.</p>	
<b>4</b>	<p><b>Savoy Cabbage</b></p> <p>Savoy cabbage is like ordinary cabbage, but with a milder flavor. It can often be used in place of green cabbage, and your dish will probably be the better for it.</p>	
<b>5</b>	<p><b>Brussels sprouts</b></p> <p>These look like small cabbages, and they're most often boiled or steamed and served as a side dish. They have a rather strong flavor, so it's best not to pair them with anything that's delicately flavored.</p>	






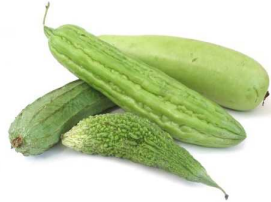


### 11.3.9 Ginger and Other Rhizomes

Rhizomes are knobby underground stems that have pungent and flavorful flesh. Ginger is the most familiar example, other rhizomes include turmeric, galangal, lesser galangal, and fingerroot.

<b>RHIZOMES</b>	
<p><b>1</b>    <b>Ginger root</b></p> <p>With its sweet yet pungent flavor, ginger has become a mainstay of many of the world's cuisines. European cooks like to use dried, ground ginger (called <i>sukku</i> in Tamil) to flavor gingerbread and other baked goods. Asian and Indian cooks prefer their ginger fresh, and they use it in spicy sauces and stir-fries.</p>	
<p><b>2</b>    <b>Turmeric (yellow ginger)</b></p> <p>Turmeric has a pungent flavor, but it's more widely known for its brilliant yellow color. You can find fresh roots in Southeast Asian and Indian markets, but dried ground turmeric is far more commonly used. It is also said to have anti-septic properties.</p>	
<p><b>3</b>    <b>Galangal</b></p> <p>It is similar to ginger. It's sold fresh, frozen, dried, or powdered, but use the dried or powdered versions only in a pinch.</p>	
<p><b>4</b>    <b>Fingerroot</b></p> <p>This ginger relative is popular in Thailand. It resembles long fingers jutting from a hand.</p>	

### 11.3.10 Fruit Vegetables




We don't usually consider the fruits of a plant to be vegetables, except for fruits that aren't very sweet. Tomatoes, squash, peppers, eggplants, and beans, for example, are all fruits, but we usually refer to them as vegetables.

FRUIT VEGETABLES		
<b>1</b>	<p><b>Tomato</b></p> <p>With their rich flavor and mild acidity, tomatoes have worked their way into thousands of recipes. Summertime is the the best season for tomatoes; those sold at other times of the year are often bland.</p>	
<b>3</b>	<p><b>Eggplants (brinjal or patlican)</b></p> <p>This is a spongy, mild-tasting vegetable that's meaty yet low in calories. It's never eaten raw, but it can be baked, grilled, or sautéed. The best eggplants are firm and shiny eggplants with unbroken skin. Eggplants have fewer seeds, which are less bitter.</p>	
<b>4</b>	<p><b>Winter squash</b></p> <p>They come in many sizes and shapes, but all have hard outer rinds that surround sweet, often orange flesh. They're usually baked or steamed, and then sometimes puréed. Select squash that are heavy for their size. Varieties of winter squash are Pumpkin, spaghetti squash, sweet dumpling squash, etc.</p>	
<b>6</b>	<p><b>Asian squash (bitter guard)</b></p> <p>This bitter vegetable is believed to have medicinal properties and is widely used throughout Asia. Varieties are bitter melon, balsam pear, Chinese okra, silk squash, silk melon fuzzy melon, hairy melon, hairy cucumber, Indian bitter melon, winter melon, etc.</p>	
<b>7</b>	<p><b>Cucumber (cuke)</b></p> <p>These gourd relatives are crisp, cool, and juicy. A slicing cucumber is usually served raw in salads, sandwiches, drinks, sushi, and hors d'oeuvres to add crunch</p>	
<b>8</b>	<p><b>Fresh chile peppers</b></p> <p>Fresh chile peppers include ancho chile, poblano pepper (fresh), banana chile, bird cherry pepper, Thai chili, California green chile, California red chile, Anaheim chile, caloro and caribe.</p>	



### 11.3.11 Other Vegetables

Vegetables, Fruits  
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OTHER VEGETABLES	
<p><b>1 Mushrooms</b></p> <p>Markets stock a variety of cultivated mushrooms, but many people prefer wild mushrooms, which are often more flavorful. Dried mushrooms are often excellent substitutes for fresh</p>	
<p><b>2 Sprouts</b></p> <p>Sprouts are newly germinated peas and beans. There are many varieties, ranging from mild and crunchy mung bean sprouts to spicy and delicate radish sprouts. Raw sprouts are great in salads and sandwiches, and the sturdier varieties can also be stir-fried briefly.</p>	
<p><b>3 Sea Vegetables</b></p> <p>Most of us unknowingly eat processed sea vegetables every day. Manufacturers use them as thickeners and stabilizers in such products as ice cream, instant pudding, whipped toppings, salad dressings, and even toothpaste. Some Varieties of sea vegetables are seaweeds, algae, marine algae arame, dulse, hijik, konbu etc. Agar-agar is a good example of sea weed.</p>	

## 11.4 COOKING OF VEGETABLES

Cooked vegetables lose vitamins, minerals, colors and flavors if not cooked properly. Here are some fast and healthy ways to cook vegetables.

**Steaming** Steaming is fast, preserves nutrients, and it works best for fresh and frozen vegetables such as carrots, broccoli, spinach and roots like beets, parsnips, peas and beans. If you don't have a steaming basket, you can fill a pot with mixed vegetables and add about 1 1/2 inches of unsalted water and cover. Simmer until the vegetables are tender. Check often to make sure that the water doesn't evaporate. If it gets too low, just add a little more water. Don't forget to keep the remaining broth for soup or do what I do, pour it in a nice mug and enjoy the warm flavorful broth.

**Roasting** Roasting is quick, simple, and is an excellent way for cooking vegetables as it preserves the vitamins,

flavors and minerals. In a large bowl, cover sliced vegetables with olive oil. Add garlic powder, onion powder, salt and pepper. Place them on a cookie sheet and roast them at 350 degrees until tender.

**Stir-Frying** Stir-frying is another very good flavor and color preserving cooking method. Sliced vegetables are put in frying pan covered at bottom with any liquid for cooking such as chicken broth or a broth made from stir-fry seasonings. Constantly stir the vegetables until they are crispy and glossy.

**Panning** Vegetables can also be cooked by the steam produced by their own vegetable juices. In a fry pan, add a little olive oil, sliced vegetables and your favorite seasonings. Cover the pan, put it on medium heat, and within 5-8 minutes you'll have spicy and crispy vegetables. Stir often. Panning works best for carrots, beans, summer squash and shredded cabbage.

## 11.5 FRUITS

Culinary fruit is defined as “Any sweet, edible part of a plant that resembles fruit, even if it does not develop from a floral ovary; also used in a technically imprecise sense for some sweet or sweetish vegetables, such as rhubarb, that resemble a true fruit or are used in cookery as if they were a fruit.”


Many hundreds of fruits, including fleshy fruits like apple, peach, pear, kiwifruit, watermelon, mango, banana, sapota, oranges, jack fruit, pomegrade, grapes, pineapple, etc. are commercially valuable as human food, eaten fresh and as jams, marmalade, fruit juices and other preserves. Fruits are also in manufactured foods like cookies, muffins, yoghurt, ice cream, cakes, and many more. Many fruits are used to make beverages, such as fruit juices (orange juice, apple juice, grape juice, etc) or alcoholic beverages, such as wine or brandy.







Many vegetables are botanical fruits, including tomato, bell pepper, eggplant, okra, squash, pumpkin, green bean, cucumber and zucchini. Olive fruit is pressed for olive oil. Apples are often used to make vinegar and wine. Spices like vanilla, paprika, allspice and black pepper are derived from berries.

Fruits are generally high in fiber, water and vitamin C. Fruits also contain various phytochemicals that do not yet have an RDA/RDI listing under most nutritional factsheets, and which research indicates, are required for proper long-term cellular health and disease prevention. Regular consumption of fruit is associated with reduced risks of cancer, cardiovascular disease, stroke, Alzheimer disease, cataracts, and some of the functional declines associated with aging.

**11.6 TYPE OF FRUITS****11.6.1 Berries**

Berries are the delicious and often fragile fruits that grow on vines, bushes, and runners. They have many virtues--they're colorful, easy to prepare, good for health, and so delicious that they can be served for dessert all by themselves. The only downside is that they're often pricey. Berries don't ripen once they're picked, so the deeply colored ones tend to be the sweetest and most flavorful.

<b>BERRY TYPES</b>		
<b>1</b>	<b>Blackberry (bramble)</b> These would be excellent berries were it not for their rather large seeds. They're still great for eating out of hand, but cooks often strain out the seeds when making pies and preserves.	
<b>2</b>	<b>Black currant</b> These are too tart to eat out of hand, but they're often used to make syrups, preserves, and the liqueur cassis. Frozen are good substitutes for fresh.	
<b>3</b>	<b>Blueberry</b> Blueberries are small and sturdy, so they're perfect for tossing into cakes, muffins, cereal bowls, and fruit salads.	
<b>4</b>	<b>Cranberry</b> These tart berries are traditionally used to makes sauces and garnishes for Thanksgiving and Christmas dinners.	
<b>5</b>	<b>Gooseberry</b> These large, tart berries are in season only in June and July, but canned gooseberries work well in pies. They're very acidic, and so they're great with roasted meats, like goose.	
<b>6</b>	<b>Zante grapes (champagne grapes)</b> These clusters of tiny grapes are often used as a garnish.	






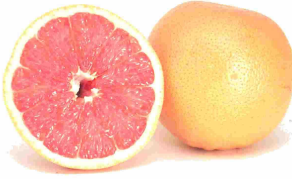
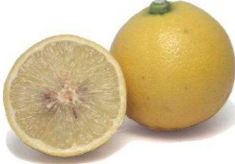
<p><b>7</b></p>	<p><b>Grapes (table grapes)</b></p> <p>Many varieties of grapes are turned into wine, vinegar, jelly, and raisins, but table grapes are for eating out of hand. They're classified by their color--red, green, and blue--and by whether they have seeds or not. Seedless varieties are popular because they're easy to eat, but often the seeded varieties offer more flavor and better value.</p>	
<p><b>8</b></p>	<p><b>Huckleberry</b></p> <p>These are similar to blueberries, and they're great for making preserves and syrups.</p>	
<p><b>9</b></p>	<p><b>Kiwi fruit (monkey peach)</b></p> <p>This small, oblong fruit is has fuzzy brown skin and beautiful green flesh dotted with edible black seeds. It tastes like a cross between gooseberries and strawberries.</p>	
<p><b>10</b></p>	<p><b>Loganberry</b></p> <p>These are like blackberries, only they're dark red when ripe and more acidic. They're especially good in pies and preserves.</p>	
<p><b>11</b></p>	<p><b>Raspberry</b></p> <p>They are hollow and fragile berries. They are highly priced.</p>	
<p><b>12</b></p>	<p><b>Strawberry</b></p> <p>Strawberries aren't as fragile as other berries, so they don't need the special handling that makes most berries so expensive. Strawberry makes excellent jam.</p>	

### 11.6.2 Citrus Fruits

Citrus fruits have stippled rinds that surround pulp that's tart, juicy, and rich in vitamin C and other nutrients. Most citrus fruits are first peeled, then the pulp is either eaten out of hand or squeezed to make juice, but some, like the kumquat, are eaten peel and all. The peels contain fragrant oils, and their zest is often used to flavor foods. When buying citrus fruit, select specimens that are smaller,

thin-skinned, and heavy for their size. They keep longer if you store them in the refrigerator.






Vegetables, Fruits  
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<b>CITRUS FRUITS</b>		
<b>1</b>	<p><b>Lemon</b></p> <p>This very sour citrus fruit widely used for its juice, rind, and zest. Varieties include the Eureka lemon, the Lisbon lemon, and Meyer lemon.</p>	
<b>2</b>	<p><b>Lime</b></p> <p>These tart green to bright yellow fruits are similar to lemons, but they're more acidic and have their own unique flavor.</p>	
<b>3</b>	<p><b>Limequat</b></p> <p>This is a cross between a lime and a kumquat. It's similar in size and shape to a kumquat, but with a green or yellow-green skin. It has a strong lime flavor.</p>	
<b>4</b>	<p><b>Orange (Sweet orange)</b></p> <p>Oranges are juicier, and better suited to squeezing. The best oranges are smaller, thin-skinned, and heavy for their size.</p>	
<b>5</b>	<p><b>Pomelo</b> (pronounced PUHM-uh-low)</p> <p>This has a very thick fluffy peel. Pulp is milder and sweeter than its closest substitute, the grapefruit.</p>	
<b>6</b>	<p><b>Grapefruit</b></p> <p>A grapefruit is a large, slightly tart kind of citrus fruit. The rind is mostly yellow, and often tinged with green or red. Grapefruits are categorized by the color of their pulp: red, pink, or white.</p>	
<b>7</b>	<p><b>Bergamot</b></p> <p>(pronounced: BUHR-gah-mot)</p> <p>This is a small acidic orange, used mostly for its peel, used in fruit cakes.</p>	




### 11.6.3 Pome Fruits

The family of pome fruits includes apples, pears, quinces, Asian pears, and loquats.

<b>POME FRUITS</b>	
<p><b>1 Apple</b></p> <p>Crisp, juicy apples can be made into pies and tarts, pressed into cider, or baked with sugar and spices.</p> <p>Softer apples are best for applesauce, while firmer apples are best for baking and making pies. Varieties of apple include Gala, Fuji, Mutsu, Jonathan, Cameo, Golden Delicious, Cortland, Empire, Red Delicious, McIntosh, Braeburn, Winesap, Pink Lady, Sundowner, Northern Spy, etc.</p>	
<p><b>2 Asian pear</b></p> <p>Asian pears are crunchy, juicy, and very fragrant. Growers produce over twenty different varieties in an assortment of sizes and colors. They're often served raw, but they can also be cooked, though they never become as soft as cooked pears</p>	
<p><b>3 Quince</b></p> <p>This pleasantly tart fruit needs to be cooked before eating. Quinces are high in pectin, so they're commonly used to make jams and jellies. Some cooks simply bake them like apples. They come into season from August to December.</p>	
<p><b>4 Loquat</b></p> <p>These are popular in Asia, where they're eaten raw and cooked into sauces that accompany meat.</p>	
<p><b>5 Crab apple</b></p> <p>These small apples are too tart to eat raw, but they're loaded with pectin and make great jams and jellies.</p>	

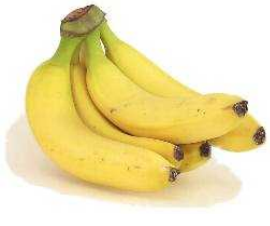






### 11.6.4 Melons

Melons are great all by themselves, though some people like to perk up their flavor by sprinkling lemon juice, salt, or liqueur on them.

<b>MELONS</b>	
<p><b>1 Watermelon</b></p> <p>There are about 50 varieties of watermelon on the market. They all taste about the same, but they vary in size, flesh color, and in whether they are seeded or seedless. Picnic melons are largest, while icebox melons are round and compact. Many stores also carry yellow-fleshed, white-fleshed, and seedless melons.</p>	
<p><b>2 Yellow melon (dua gan)</b></p> <p>These melons are small, about the size of medium papaya. They taste like cantaloupe, but with firmer flesh.</p>	
<p><b>3 Santa Claus melon</b></p> <p>This is distinguished mostly by its long shelf life. They have thick rinds.</p>	
<p><b>4 Persian melon</b></p> <p>These are large, round melons. They're excellent when vine-ripened, but mediocre when not. When ripe melons are picked, the stem falls off easily, leaving a small, clean depression. They peak in the summer months.</p>	
<p><b>5 Cantaloupe (nutmeg melon)</b></p> <p>These are popular because they're easy to select and very sweet. Ripe melons have dull yellow backgrounds with raised netting. Cantaloupes are cheapest in the summer.</p>	
<p><b>6 Kiwano</b></p> <p>This melon has a gorgeous orange rind with spikes. The yellow-green flesh has the consistency of jello, and tastes a bit like cucumbers.</p>	












### 11.6.5 Common Tropical Fruits

COMMON TROPICAL FRUITS		
<b>1</b>	<p><b>Banana</b></p> <p>Most of the bananas eaten in our lifetimes are the yellow Cavendish bananas. The burro banana is shorter than the Cavendish, and has an interesting lemony flavor.</p>	
<b>2</b>	<p><b>Fig</b></p> <p>Varieties include Calimyrna or Smyrna and Kadota, both with green skin and pinkish-white flesh, and the most popular variety, and the Mission fig or black Mission fig, with dark purple skin and pink flesh.</p>	
<b>3</b>	<p><b>Green papaya</b></p> <p>Southeast Asian cooks like to shred these into salads. Protease enzyme present in the green papaya called papain is a meat tenderizer which softens tough meat.</p>	
<b>4</b>	<p><b>Papaya (fruta bomba)</b></p> <p>With their subtle tropical flavor, papayas are wonderful in fruit salads, puréed fruit drinks, or even shish kabobs. days. Hawain solo is a choice sweet variety.</p>	
<b>5</b>	<p><b>Pineapple</b></p> <p>Pineapples are juicy, mildly acidic, and very versatile. They can be squeezed for juice, sliced on cakes, skewered and grilled, or eaten raw without adornment.</p>	
<b>6</b>	<p><b>Pomegranate</b></p> <p>Inside the pomegranate's leathery skin, hundreds of pretty kernels, each with a tiny seed surrounded by ruby red juicy pulp are found.</p>	
<b>8</b>	<p><b>Coconut</b></p> <p>Dry coconut is with a hard brown shell surrounding firm coconut meat with liquid in the center. Green coconuts or water coconuts are young coconuts with very soft meat inside.</p>	

### 11.6.6 Exotic Tropical Fruit




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EXOTIC TROPICAL FRUITS		
1	<p><b>Litchi (lychee)</b></p> <p>This popular Chinese fruit is about the size of a walnut, with a thick tough pumpy skin encasing white translucent pulp that's similar in texture to a grape. The flavor is sweet, exotic, and very juicy.</p>	
2	<p><b>Jackfruit</b></p> <p>This is the largest tree-borne fruit in the world. The yellowish pulp tastes a bit like banana. The seeds can be boiled and eaten.</p>	
3	<p><b>Guava</b></p> <p>These bruise easily, so markets usually sell them while they're still hard and green. Ripened at room temperature they become yellow and very aromatic.</p>	
4	<p><b>Feijoa (pronounced: feh-JO-uh)</b></p> <p>To eat feijoas, just cut them in half and scoop out the pulp with a spoon. They also make terrific preserves and syrups.</p>	
5	<p><b>Durian (stinky fruit)</b></p> <p>The weird and smelly durian has attracted a cult-like following. It is said that 'it smells like hell and tastes like heaven.'</p>	
6	<p><b>Cherimoya (custard apple)</b></p> <p>This South American tropical fruit is shaped like a pine cone and has a gray-green, scaly skin. The soft white pulp inside has large black (inedible) seeds and tastes like a creamy blend of tropical flavors and is sourish to taste.</p>	
7	<p><b>Tamarind (Indian date)</b></p> <p>The pulp from the tamarind pod is used as a souring agent. There's also a sweet tamarind, which is used primarily to make drinks.</p>	

<p><b>8</b></p>	<p><b>White sapote</b></p> <p>This tropical fruit has sweet, creamy pulp that's wonderful in fruit salads or shakes. They arrive in the summer. Since they bruise easily when ripe, they're usually sold while they're still hard.</p>	
<p><b>9</b></p>	<p><b>Mango</b></p> <p>The yellow to orange fruit is juicy, distinctively spicy, and a rich source of vitamins A, C, and D. Mango fruit varies in shape, colour, and size from ovoid to long, from vividly red and yellow to dull green, and from plum- to melon-size.</p>	

### 11.6.7 Stone Fruit

The family of stone fruits includes cherries, plums, apricots, nectarines, and peaches. They all arrive in the summer, though you can sometimes find pricey imports during the off-season. Stone fruits don't become sweeter after they're picked, but growers often harvest them while they're still a bit underripe so that they won't bruise during transit. Pulp encloses hard stony seed and hence the name.






<p><b>STONE FRUITS</b></p>		
<p><b>1</b></p>	<p><b>Apricot</b></p> <p>Like other stone fruit, apricots are sweetest, and most prone to bruising, when they're allowed to ripen on the tree.</p>	
<p><b>2</b></p>	<p><b>Cherry</b></p> <p>There are three main categories of cherries: sweet cherries, which are for eating out of hand, sour cherries, which are best suited for making pies, preserves, and sauces, and tart chokecherries.</p>	
<p><b>3</b></p>	<p><b>Plum (fresh prune)</b></p> <p>Plums are juicier than other stone fruits, and have a longer growing season. There are many varieties, some sweet, some acidic, and some best suited for drying into prunes.</p>	









**11.7 NUTS**

Cooks and grocers define nuts as anything with edible kernels and hard shells. This includes true nuts like chestnuts and acorns, but also things that botanists would class as seeds, like Brazil nuts, or legumes, like peanuts. Nuts are high in fat and protein, and people throughout the world eat them as snacks or incorporate them into both sweet and savory dishes. Many nuts can be eaten raw but roasting them helps intensify their flavor.

Nuts are usually harvested in the fall, and it's best to buy unprocessed nuts then. Many unshelled nuts can be kept for up to a year in a cool place, but shelled nuts, especially those that have been cut or roasted, are more prone to rancidity and should be stored in the refrigerator or freezer in an airtight container.

**11.8 VARIETIES OF NUTS**

<b>VARIETIES OF NUTS</b>		
<b>1</b>	<p><b>Almond</b></p> <p>Almonds have a crunchy texture and a rich, delicate flavor that's especially good in desserts, like candy, ice cream, tortes, and coffee cake. They are good to eat out of hand or after roasting.</p>	
<b>2</b>	<p><b>Brazil nut</b></p> <p>These nuts come from the Amazonian rainforest, and they're rich in protein, omega-3 fatty acid, and calcium.</p>	
<b>3</b>	<p><b>Candlenut</b></p> <p>Candlenuts must be cooked before eating, since they're highly toxic when raw. Ground candlenuts are often used to thicken Malaysian and Indonesian curries.</p>	
<b>4</b>	<p><b>Cashew</b> (<i>pronounced: KA-shoe</i>)</p> <p>These rich, sweet nuts have a toxic shell, so they're almost always sold shelled. Toast them briefly in the oven to boost their flavor. Eaten fresh or as roasted and salted nuts.</p>	
<b>5</b>	<p><b>Chestnut (Marron)</b></p> <p>These sweet, starchy, low-fat nuts are eaten hot from the roaster, or added to soups, stuffing, and desserts.</p>	

6	<p><b>Chinese Almond (Apricot Seed)</b></p> <p>These aren't really almonds at all, but apricot kernels. They taste a lot like bitter almonds, and have a rich, heavenly almond-extract fragrance.</p>	
7	<p><b>Gingko Nut</b></p> <p>These nuts date back some 150 million years, and are believed to be a powerful aphrodisiac. Asian cooks like to use them in desserts and stir-fries.</p>	
10	<p><b>Peanut</b></p> <p>These aren't really nuts, but legumes that grow underground. They're cheaper than most nuts, and are often eaten out of hand or as roasted and salted nuts or incorporated into candies, stir-fries, or trail mixes. It also a source of quality edible oil.</p>	
11	<p><b>Pecan</b></p> <p>This North American nut is like a walnut, only sweeter and milder.</p>	
12	<p><b>Pistachio nut</b></p> <p>They're crunchy and delicately sweet, so they're great in everything from ice cream to pilafs.</p>	
13	<p><b>Walnut</b></p> <p>Walnuts are rich and flavorful, and cooks like to use them in everything from fudge to salads.</p>	
14	<p><b>Acorn</b></p> <p>These nuts come from oak treesAcorns from white oaks aren't nearly as bitter as those from red or black oaks, and can be roasted without first soaking them.</p>	
15	<p><b>Pine Nut</b></p> <p>These expensive and delicate seeds are harvested from pine trees. All pine nuts are high in fat, so store them in the refrigerator or freezer to keep them from getting rancid.</p>	



## CHECK YOUR PROGRESS

1. Fill in the blanks
  - i) Tomato and beans are ....., but we usually refer and use them as vegetables.
  - ii) Carrot is the rich source of vitamin .....
  - iii) Green onions have small ..... and long green .....
  - iv) Texas spring sweet is popular variety of .....
  - v) Spider mustard is also called as .....
2. True or False
  - i) Fungi are also considered as vegetables.
  - ii) Black raddish should not be served raw.
  - iii) Potato is quite low in calories.
  - iv) Ramps have a strong onion-garlic flavour.
  - v) Sweet Onions can not be served raw.

## 11.9 LET US SUM UP

Vegetables are a catch-all category that includes many of the edible parts of a plant, like stems, roots, flowers, and leaves. We don't usually consider the fruits of a plant to be vegetables, except for fruits that aren't very sweet. Tomatoes, squash, peppers, okra, eggplants, and beans, for example, are all fruits, but we usually refer to them as vegetables.

Culinary fruit is defined as "Any sweet, edible part of a plant that resembles fruit, even if it does not develop from a floral ovary; also used in a technically imprecise sense for some sweet or sweetish vegetables, such as rhubarb, that resemble a true fruit or are used in cookery as if they were a fruit."

Nuts are anything with edible kernels and hard shells. Nuts are usually high in fat and protein, and people throughout the world eat them as snacks or incorporate them into both sweet and savory dishes. Many nuts can be eaten raw but roasting them helps intensify their flavor.

## 11.10 LESSON END ACTIVITY

1. Visit a market and find the available vegetables. And also visit a supermarket and look for more vegetables you didn't find them in the market. Note the mother tongue equivalents of the vegetable names.

## 11.11 KEY WORDS

**Herbaceous** Relating to or characteristic of an herb as distinguished from a woody plant.

**Calories** A unit of energy used to express the energy yield of foods and energy expenditure by the body.

**Pungent** Affecting the organs of taste or smell with a sharp acrid sensation.

**Inflorescent** A flower cluster segregated from any other flowers on the same plant, together with the stems and bracts (reduced leaves) associated with it.

### 11.12 QUESTIONS FOR DISCUSSION

1. Define the term culinary fruit
2. Give a brief description about nuts and give five examples
3. What are stone fruits? Explain a few with its edible use
4. Enumerate briefly about tropical fruits with examples.
5. Differentiate between watermelons and persimmon melons.
6. Explain about Citrus fruits.
7. Give a detailed note about the berries
8. What are cabbages? Give a brief note about a few available in the market.
9. Explain about cooking greens.
10. What are stalk vegetables?

### CHECK YOUR PROGRESS - ANSWER

1. i) fruits            iii) bulbs, stalk            v) mizuna  
ii) A                    iv) sweet onion
2. i) True                iii) True                    v) False  
ii) False              iv) True

### 11.13 REFERENCES

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## LESSON 12

# KITCHEN EQUIPMENTS AND COOKING FUEL

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### 12.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of:

- Kitchen equipments and cooking fuels.

## 12.1 INTRODUCTION

A kitchen, is a room or part of a room (sometimes called "kitchen area" or a "kitchenette") used for food preparation and cooking.

The development of the kitchen in the world has been intricately and intrinsically linked with the development of the cooking range or stove. Until the 18th century, open fire or charcoal were the sole means of heating food, and the architecture of the kitchen reflected this. When technical advances brought new ways to heat food in the 18th and 19th centuries, architects took advantage of newly-gained flexibility to bring fundamental changes to the kitchen.

Technological advances during industrialization brought major changes to the kitchen. Iron stoves, which enclosed the fire completely and were more efficient, appeared. Gas pipes were first laid in the late 19th century, and gas stoves started to replace the older coal-fired stoves. The trend to increasing gasification and electrification continued at the turn of the 20th century. A trend began in the 1940s to equip the kitchen with electrified small and large kitchen appliances such as blenders, toasters, and later also microwave ovens. Following the end of World War II, massive demand in Europe for low-price, high-tech consumer goods led to Western European kitchens being designed to accommodate new appliances such as refrigerators and electric/gas cookers.

## 12.2 KITCHEN EQUIPMENTS

Various types of equipment are used in a kitchen. The type, amount and size of equipment will depend on the type of menu being provided and number of people to dine. Kitchen equipment may be divided into three categories:

- 1) **Large equipment** – cooking ranges, electric ovens, microwave ovens, steamers, boiling pan, deep fat-fryers, sinks, tables.
- 2) **Mechanical equipment** – peelers, mincers, mixers, refrigerators, dish-washers.
- 3) **Utensils and small equipment** – pots, pans, whisks, bowls, spoons and laddles.

## 12.3 LARGE EQUIPMENTS

### 12.3.1 Ranges and Ovens

An oven is an enclosed compartment for heating, baking or drying. It is most commonly used in cooking and pottery. Two common kinds of modern ovens are gas ovens and electric ovens. Ovens used in pottery are also known as kilns. An oven used for heating or for industrial processes is called a furnace or industrial oven.

In the past, cooking ovens were fueled by wood or coal. Modern ovens are fueled by gas or electricity. When an oven is contained in a complete stove, the burners on the top of the stove may use the same or different fuel than the oven.

Steam ovens introduce water (in the form of steam) into the cooking chamber. This can aid the formation of a crisp crust on baked goods and prevent the drying-out of fish and casseroles. The degree of humidity is usually selectable among at least several steps. Some steam ovens use water carried to the oven by the user in a container; others are permanently connected to the building plumbing.



Figure 12.1 Ranges and Ovens

More modern ovens, such as General Electric's Trivection oven, may also provide combined thermal and microwave cooking. This can greatly speed the cooking of certain types of food while maintaining the traditional characteristics of oven cooking such as browning.

Ovens also vary in the way that they are controlled. The simplest ovens may not have any controls at all; the several ovens simply run continuously at various temperatures. More-conventional ovens have a simple thermostat: which turns the oven on and off to maintain the required set temperature nearly constantly and selects the temperature at which it will operate. Set to the highest setting, this may also enable the broiler element. A timer may allow the oven

to be turned on and off automatically at pre-set times. More-sophisticated ovens may have complex, computer-based controls allowing a wide variety of operating modes and special features including the use of a temperature probe to automatically shut the oven off when the food is completely cooked to the desired degree for cleaning.

Some ovens provide various aids to cleaning. Continuous cleaning ovens have the oven chamber coated with a catalytic surface that helps break down (oxidize) food splatters and spills over time. Self cleaning ovens use pyrolytic decomposition (extreme heat) to oxidize dirt. Steam ovens may provide a wet-soak cycle to loosen dirt, allowing easier manual removal. In the absence of any special methods, chemical oven cleaners are sometimes used or just old-fashioned scrubbing.

### 12.3.2 Steamers

There are basically three types of steaming ovens: Atmospheric; Pressure; and Pressure less.

There are also combination steaming ovens; pressure/ convection steam; pressureless/ fully pressurised; steaming/ hot air cooking; combination of hot air and steam; combination of hot air and steam with two settings.



Figure 12.2 Steamers

In addition, dual pressure steamers, switchable between low pressure and high pressure, and two pressure settings plus zero are available. Steaming ovens continue to improve and become more versatile. The modern combination steamers which can be used for steaming, stewing, packing, braising, roasting, backing, vacuum cooking, gratinating, reconstituting, blanching and defrosting. They have electronic controls for easier setting and more precise time/ temperature controls. The advantage of the electronic control is that they assist in fuel efficiency. They are available in several sizes and process efficiencies.

### 12.3.3 Boiling Pans

Many types are available in different metals – aluminium, stainless steel, etc – in various sizes (10, 15, 20, 30 and 40 litre

capacity) and they may be heated by gas or electricity. As they are used for boiling or stewing large quantities of food, it is important that they do not allow the food to burn. For this reason the steam-jacket type boiler is the most suitable. Many of these are fitted with a tilting



device to facilitate emptying the contents.

Figure 12.3 Boiling Pans/Steam Jacket Kettle

### 12.3.4 Deep Fat-Fryers

A deep fat-fryer is one of the most extensively used items of equipment in many catering establishments. Fryers are heated by gas or electricity and incorporate a thermostatic control in order to save fuel, regulate temperature and prevent overheating. There is a cool zone below the source of heat into which food particles can sink without burning, thus preventing spoiling of other foods being cooked. This form of heating also economises fat consumption.



Figure 12.4 Deep Fat Fryers

#### Pressure Fryers:

Food is cooked in an air-tight frying utensil enabling food to be fried a lot faster and at a lower oil temperature and pressure.

#### Hot Air Rotary Fryers:

These are designed to cook batches of frozen blanched chips or battered foods in 4-6 minutes without any oil. Computerised fryers are available which may be programmed to control automatically cooking temperatures and times, on and off switches, basket lifting and product holding times. Operational information is fed from a super-sensitive probe, which is immersed in the frying medium and

passes information about temperature and rates of temperature change which may be caused by: the initial fat temperature, amount food being fried, fryer efficiency and capacity, fryer recovery rate, quantity and condition of fat, product temperature and water content. With all the above information the fryer computes exact cooking times and an automatic signaling device indicates the end of a cooking period.

### 12.3.5 Hot-Cupboards

Hot-cupboards 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-cupboard is controlled at a reasonable temperature. This is important, otherwise the plates and food will be too hot.



Figure 12.5 Hot Cupboards

### Bains-Marie:

The bain-marie consists of a large container filled with a working liquid (usually water) and another, smaller container filled with the substance to be heated. The smaller container is partially immersed in the larger container, and the larger container is heated. The temperature of the working liquid cannot normally exceed the boiling point of that liquid at the ambient atmospheric pressure, and so the temperature of the inner container can be brought to a known limit and held there by bringing the outer working liquid to a boil.



Figure 12.6 Bain-Marie

Bains-Maries are used for holding large quantities of food for service. It is generally used for servicing foods in commercial organizations such as hospitals, restaurants, canteens, hotels etc.



### 12.3.6 Grills and Salamanders

A salamander grill is a culinary utensil used to cook food. Mainly used to grill, the utensil can also be used for browning food, such as a pastry or pudding, as a portable stove, or as a broiler.

The salamander or grill heated from above by gas or electricity probably causes more wastage of fuel than any other kitchen equipment through being allowed to bum unnecessarily for long unused periods. Most salamanders have more than one set of heating elements or jets and it is not always necessary to have them all turned on full.



Figure 12.7 Grill & Salamander

Salamander bars and draining trays should be cleaned regularly with hot water containing a grease solvent such as soda. After rinsing they should be replaced and the salamander lit for a few minutes to dry the bars.

For under-fired grills to work efficiently they must be capable of cooking food quickly and should reach a high temperature 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, rinsed, dried and replaced on the grill. Care should be taken with the fire bricks if they are used for lining the grill as they are easily broken.

### 12.3.7 Fry Plates & Griddle Plates

Griddles are flat plates of metal used for frying, grilling, and making pan breads (such as pancakes, injera, tortillas, chapatis, and crepes). Traditional iron griddles are circular, with a semicircular hoop fixed on opposite edges of the plate and rising above it to form a central handle. Rectangular griddles that cover two stove burners are now also common, as are griddles that have a ribbed area that can be used like a grill pan. Some have multiple square metal grooves enabling the contents to have a defined pattern, similar to a waffle maker. Like frypans, round griddles are generally measured by diameter (20 – 30 cm).





Figure 12.8 Fry Plates and Griddle Plates

Griddles with zone heating are useful when demand varies during the day. These reduce energy consumption in quiet periods while still allowing the service to be maintained.

### 12.3.8 Barbecues

Barbecues are becoming increasingly popular because it is easy to cook and serve quick tasty food on them and the outdoor location, smell and sizzle develop an atmosphere which many customers enjoy.



Figure 12.9 Barbecue

There are three main types of barbecue: traditional charcoal, gas (propane or butane) and electric. Remember that the charcoal-fired type takes about an hour before the surface is ready. With gas and electricity the barbecue is ready to cook almost immediately.

### 12.3.9 Sinks

A sink or basin is a bowl-shaped fixture that is used for washing. Different materials are used for sinks according to the purpose for which they are intended: Heavy galvanised iron for heavy pot wash; Stainless steel for general purposes.

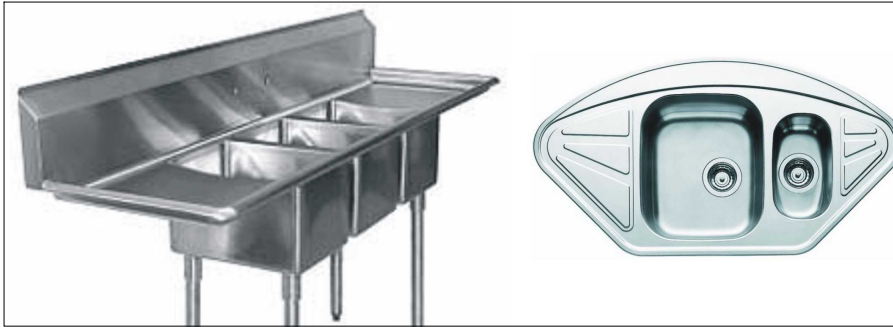


Figure 12.10 Sinks

### 12.3.10 Tables

Formica or stainless steel topped tables should be washed with hot detergent water then rinsed with hot water containing a sterilising agent –alternately, some modern chemicals act as both detergent and sterilizing agents. Wooden tables should not be used. Marble slabs should be scrubbed with hot water and rinsed. All excess moisture should be removed by wiping with a clean, dry cloth. No cutting or chopping should be allowed on table tops; cutting boards should be used. Hot pans should not be put on tables; triangles must be used to protect the table surface. The legs and racks or shelves of tables are cleaned with hot detergent water and then dried. Wooden table legs require scrubbing.

## 12.4 MECHANICAL EQUIPMENT

### 12.4.1 Mincers

Mincers are used for chopping vegetables or meat. Mincers are compact, hygienically designed machines capable of providing a cool, efficient mincing action without squashing or pulping the product.



Figure 12.11 Mincers

### 12.4.2 Mixers

A mixer is a kitchen appliance intended for mixing, folding, beating, and whipping food ingredients. Mixers come in two major variations, hand mixers and stand mixers.

A hand mixer, as the name implies, is a hand-held mixing device. It typically consists of a handle mounted over a large

enclosure containing the motor, which drives one or two beaters. The beaters are immersed in the food to be mixed.



Figure 12.12 Mixer

A stand mixer is essentially the same as a hand mixer, but is mounted on a stand which bears the weight of the device. Stand mixers are larger and have more powerful motors than their hand-held counterparts. They generally have a special bowl that is locked in place while the mixer is operating. Heavy duty commercial models can have bowl capacities in excess of 100 quarts (95 L). Typical home and commercial models are equipped with bowls of around 4 quarts (4 L). A typical home dick stand mixer will include a wire whip for whipping creams and egg whites; a flat beater for mixing batters; and a dough hook for kneading.

### 12.4.3 Blender

A blender or liquidiser is a kitchen appliance used to mix ingredients or puree food. The blending container can be made of glass, plastic, or stainless steel, and often has graduated markings for approximate measuring purposes. At the top of the container is a lid to prevent ingredients from escaping during operation. At the bottom is a serrated blade assembly, sometimes removable for cleaning purposes.



Figure 12.13 Blender

### 12.4.4 Refrigerators

A refrigerator (often called a "fridge" for short) is a cooling appliance comprising a thermally insulated compartment and a mechanism to transfer heat from it to the external environment, cooling the contents to a temperature below ambient.

Refrigerators are extensively used to store foods which deteriorate at ambient temperatures; spoilage from bacterial growth and other processes is much slower at low temperatures. A device described as a "refrigerator" maintains a temperature a few degrees above the freezing point of water; a similar device which maintains a temperature below the freezing point of water is called a "freezer". Freezers keep their contents frozen. They are used both in households and for commercial use. Most freezers operate at around  $-18^{\circ}\text{C}$  ( $0^{\circ}\text{F}$ ).



Figure 12.14 Refrigerators

## 12.5 UTENSILS AND SMALL EQUIPMENTS

### 12.5.1 Cookware and Bakeware

Cookware and bakeware are types of food preparation containers commonly found in the kitchen. Cookware comprises cooking vessels, such as saucepans and frying pans, intended for use on a stove or range cooktop. Bakeware comprises cooking vessels intended for use inside an oven. Some utensils are both cookware and bakeware.

**Braising pans and roasting pans** (also known as braisers and roasters) are large, wide and shallow, to provide space to cook a roast (chicken, beef, or pork). They typically have two loop or tab handles, and may have a cover. Roasters are usually made of heavy gauge metal so that they may be used safely on a cooktop following roasting in an oven. Unlike most other cooking vessels, roasters are usually oblong or oval. There is no sharp boundary between braisers and roasters - the same pan, with or without a cover, can be used for both functions.

**Casserole pans** (for making casseroles) resemble roasters and dutch ovens, and many recipes can be used interchangeably between them. Depending on their material, casseroles can be used in the oven or on the stovetop. Casseroles are commonly made of glazed ceramics or pyrex.

**Dutch ovens** are heavy, relatively deep pots with a heavy lid, designed to re-create oven conditions on the stovetop (or campfire).

They can be used for stews, braised meats, soups, and a large variety of other dishes that benefit from low heat, slow cooking. Dutch ovens are typically made from cast iron, and are measured by volume.

**Large and small skillets** Frying pans, frypans, or skillets provide a large flat heating surface and shallow sides, and are best for pan frying. Frypans with a gentle, rolling slope are sometimes called omelette pans. Grill pans are frypans that are ribbed, to let fat drain away from the food being cooked. Frypans and grill pans are generally measured by diameter (20–30 cm).

**Saucepans** (or just "pots") are vessels with vertical sides about the same height as their diameter, used for simmering or boiling. Saucepans generally have one long handle. Larger pots of the same shape generally have two handles close to the sides of the pot (so they can be lifted with both hands), and are called sauce-pots or soup pots (3–12 liters). Saucepans and saucepots are measured by volume (usually 1–8 L). While saucepots often resemble dutch ovens in shape, they do not have the same heat conduction characteristics.

**Saute pans** used for sauteing, have a large surface area, like a frypan, but with vertical sides, to prevent food from escaping during cooking.

**Stockpots** are large pots with sides at least as tall as their diameter. This allows stock to simmer for extended periods of time without reducing too much. Stockpots are typically measured in volume (6-36 L). Stock pots come in a large variety of sizes to meet any need from cooking for a family to preparing food for a banquet. A specific type of stockpot exists for lobsters, and an all-metal stockpot usually called a caldero is used in hispanic cultures to make rice.

**Woks** are typically lens-shaped. This allows a small pool of cooking oil to be heated to a high heat using relatively little fuel, while the outer areas of the wok are used to keep food warm after it has been fried in the oil. In the Western world, woks are typically used only for stir-frying, but they can actually be used for anything from steaming to deep frying.

**Baking pans** are designed for use in the oven (for baking) and encompass a variety of different styles of bakeware such as cake pans, pie pans, and loaf pans. These are often made from light or medium gauge metal. The longest lasting bakings sheets and pans are made with heavy-gauge steel or aluminum. They are heavier in weight which helps in heat distribution evenly and prevents the metal from warping.

**Cake pans** include square pans, round pans, and speciality pans such as angel food cake pans and springform pans often used for baking cheesecake.

**Sheet pans** or cookie sheets are bakeware with large flat surfaces.

Kitchen Equipments  
and Cooking Fuel



Figure 12.15 Cookware

### 12.5.2 Cutting, Mashing, Grating & Grinding Tools

**Cutting** - A chef's knife, also known as a French knife, is a cutting tool used in food preparation. It is the primary general-utility knife for most Western cooks. A chef's knife generally has a blade eight-inches (20 cm) in length and 1 and a half inches in width, although individual models range from six to 14 inches (15 to 36 cm) in length.



Figure 12.16 Chef Knife

**Grater** is a kitchen utensil used to grate foods into fine strips or crumbs. Several types of graters have different sizes of grating slots, and can therefore aid in the preparation of a variety of foods. They are commonly used to grate cheese and lemon or orange peel (to add zest), and can also be used to grate other soft foods. They are commonly used in the preparation of toasted cheese, Welsh rarebit, and macaroni and cheese.



**Chinois** fits on top of a deep container and mashes food when pressed through it.



Figure 12.17 Mashing, Grating and Grinding Tools

**Eggbeater** used to beat mixture vigorously and homogenise.

**Mortar and pestle** is a tool used to crush, grind, and mix substances. The pestle is a heavy stick whose end is used for pounding and grinding, and the mortar is a bowl. The substance is ground between the pestle and the mortar.

**Potato masher or bean masher** is a food preparation utensil used to crush soft food for such dishes as mashed potatoes, apple sauce, or refried beans.

**Meat mallets** tenderise or flatten meat. Made from wood or metal, they are typically two-sided, one flat with slight bumps, and the other with more pronounced protrusions. Meat mallets can be made from wood, plastic, or steel, but their use has lessened with the invention of cube steak machines and other electric tenderizers. Meat mallets can also be used to crush ice.

### 12.5.3 Vegetable Peelers

A peeler is a metal blade attached to a metal, plastic or wooden handle that is used for peeling vegetables, frequently potatoes. There are two main varieties, the 'Yorkshire' (or sometimes called a Lancashire peeler) design involving the blade as an extension of a handle, in much the same way as the blade is attached to a knife.



Figure 12.18 Vegetable Peelers



The second variety more closely resembles a safety razor (sometimes it is called a Y-peeler (due to its shape), Rex peeler, yoke peeler, or speed peeler), with the blade perpendicular to the handle, is used with a similar action to a razor, shaving off skin in strips parallel to the handle. Most speed peelers have an 'eye gouger' beside the blade, a loop of metal used to dig out eyes and blemishes from the potato. Peelers can be used on citrus fruits, asparagus, eggplant, tomatoes and even mushrooms.

#### 12.5.4 Extracting and Straining Tools

**Cheesecloth** This cloth is made of a tightly woven cloth and is used for straining fine particles from a liquid suspension

**Coffee filter** is a coffee-brewing utensil, usually made of disposable paper, but recently stainless steel filters are in use. They are used to brew filter coffee, the form of coffee common in India.

**Colander** Cooks use these to wash foods or to drain noodles or



vegetables after boiling. Large metal ones are best.

Figure 12.19 Extracting and Straining Tools

### 12.6 COOKING FUEL

Application of heat is basic to all forms of cooking. This can be broadly grouped into two categories.

**Dry Heat** Heat is generated by burning fuel and directly using it for cooking. The heat energy so generated is directly conducted to the food through air and it is known as heat convection.

**Wet Heat** The heat generated by burning fuel is first used to boil water which produces steam. Steam carries heat to cook the food and this method is known as heat conduction.

#### 12.6.1 Sources of Energy

**Petroleum** This includes crude petroleum and its distillates and fractions such as kerosene and diesel. This is a liquid form of fossil fuel which is pumped out.

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<b>Coal &amp; Coke</b>	This is a solid form of combustible material which is mined out. This is largely used to generate electricity commercially.
<b>Natural Gas</b>	This is a gaseous form of energy which is used directly to produce heat. This is also liquefied and the product is known as Liquefied Petroleum Gas (LPG). This liquefied LPG may also be conveniently bottled in gas cylinder for use. It is also easy and convenient to transport rather than in gaseous form.
<b>Unconventional Energy</b>	As the name implies they are non-traditional sources of energy that include wind (mill) energy, wave energy, solar energy etc.
<b>Hydrothermal Power plants</b>	Produce energy which is harnessed through turbines the rotation of which produces electricity which can be used to generate heat for cooking.
<b>Biomass Energy / Biofuels</b>	Photosynthetic activity of plants produce biomass which is largely stored in stem (wood), roots and leaves in addition to flowers and fruits. The woody material is burnt to produce heat which is used for cooking. Biofuels, as the name implies are produced from biological sources. Starch and sugars are fermented to produce ethanol which is mixed with petrol and is called as gasohol. Vegetable oil are converted to biodiesel, (palm diesel from palm oil) through a process called esterification and is a substitute for petroleum diesel.

Heat energy used for cooking predominantly comes from biomass (parts of plants), gas (LPG), electricity, coal/ coke and oil (petroleum and vegetable oils).

## 12.7 SYSTEMS OF GENERATING HEAT FOR COOKING

The following are some of the methods through which the heat for cooking is generated:

### 12.7.1 Cooking by Open Fire

The use of wood as a fuel source for home heat is as old as civilization itself. Wood as a source of heat is still common throughout much of the world. Wood fuel may be available as firewood (eg. logs, bolts, blocks), charcoal, chips, sheets, pellets and sawdust. The particular form used as fuel depends upon factors such as availability, quantity, quality, calorific value and above all its economics.

**Soft woods** such as pine or birch, kindle quickly, produce intense heat, and are best for a quick, blazing fire.

**Hardwoods** like oak, ash, and hickory, burn more slowly, but produce harder coals, which retain the heat longer, and are better where long-continued heat is required.

**Charcoal** wood may be used in the form of small logs or cut out into bits called chips. Coal is made by charring or burning wood with only a limited supply of air (oxygen), burns easily and produces greater heat in proportion to its weight than any other fuel. It should never be burnt in a closed room to avoid smoke injury or choking.

**Anthracite coal** is a kind of mined out mineral charcoal derived from ancient vegetation buried in the earth, and so thoroughly pressed that nothing is left but pure carbon, a little sulphur, and the incombustible ash. It kindles slowly, yields an intense, steady heat, and burns for a longer time without replenishing than the hardest wood.

**Coke** is often used in cities. It is the briquetted form of coal from which illuminating gas is manufactured. The heat is intense, but transient.

**Fluid bed furnaces** of late, are used for efficient and economic burning by using materials such as saw dust, charcoal dust, brans or husks. They are fed out at the bottom of the furnace and are carried upward for burning at the top through strong air current.

### 12.7.2 Cooking by Oil

Oils burn easily and provide instant energy. There are two types of oil which can be used for this purpose with very little waste; kerosene and heavy diesel oil. Crude petroleum can also be used directly without refining. Oil cooking is a cleaner method than firewood.

**Kerosene** is a colourless, thin, flammable liquid. Kerosene is non-corrosive, non-volatile, and extremely stable in storage. In countries like India, kerosene is the main fuel used for household cooking, especially by the poor. Kerosene stoves have replaced the traditional wood-based cooking appliances which are unhealthy, smoky, choking and inefficient.

**Diesel** or diesel fuel is a specific fractional distillate of petroleum used as fuel for cooking.

### 12.7.3 Cooking by Gas

Gas is highly combustible and explosive; therefore must be handled with care. Gas is a safe fuel but like all fuels it must be used with utmost care. Gas is easier to control than electricity and it can usually be adjusted to give the desired degree of heat. It is combusted in conjunctions with air to give the correct air:gas mixture as denoted by the colour of the flame, and is maintained at constant even pressure by means of a gas governor in the pipeline thus giving consistency of supply and performance.

Cooking by gas is easily the most flexible and useful method for cooking; very little coal gas or town gas is available in India but large quantities of butane gas are becoming increasingly available in the cities. This is a first-class cooking medium, as its calorific value is considerably more than normal town gas. A reasonable range of cooking equipment is now available in India for use with this medium, for frying, baking and roasting of food. By means of automatic regulators, the cooking process can be done at nominal cost. In addition to this, the price compares favourably with that of other cooking fuels.

#### 12.7.4 Cooking by Electricity

Electricity cannot be seen, felt, tasted or smelled. Installed and used correctly, it is a very safe source of energy, but misused can kill (electricution) or cause serious injury. It is therefore essential that any electrical installation is undertaken by qualified engineers and maintained properly.

It is fortunate that electricity is readily available in India and the manufacture and use of electrical cooking equipment is increasing quite rapidly. A considerable range of equipment necessary for the modern kitchen can now be obtained. It is one of the more efficient, waste less cooking, Hot-plates, boilers, toasters, cooking ranges, hot water boilers, chapatti plates, fish ranges, etc., make cooking and modern living pleasant.

#### 12.7.5 Cooking with Solar Energy

Solar cooking uses only sunlight to cook. As they use no fuel they cost nothing to run. Environmental organizations are promoting their use worldwide to help slow down deforestation and desertification, caused by the need for firewood used to cook. Solar cookers are also sometimes used in outdoor cooking, especially in situations where minimal fuel consumption or fire risk are considered highly important.

### CHECK YOUR PROGRESS

#### 1. Fill in the blanks

- i) An ..... is an enclosed compartment for heating, baking or drying.
- ii) Fryers are heated by gas or electricity and incorporate a ..... control in order to save fuel, regulate temperature to provide constant and to prevent overheating.
- iii) ..... are used for heating plates and serving dishes and for keeping food hot.
- iv) ..... is made of a tightly woven cloth and is used for straining fine particles from a liquid suspension.
- v) LPG is the abbreviation for .....

## 2. True or False

- i) Bains-Maries are used for holding large quantities of food for service.
- ii) Barbecues are hard to cook.
- iii) Refrigerators are extensively used to store foods which deteriorate at ambient temperatures.
- iv) Coal is made by charring or burning wood with only a limited supply of air (oxygen)
- v) Gas is highly combustible and explosive

## 12.8 LET US SUM UP

Various types of equipment are used in a kitchen. The type, amount and size of equipment will depend on the type of menu being provided. Kitchen equipment may be divided into three categories: Large equipment are ranges, steamers, boiling pan, deep fat-fryers, sinks, tables. Mechanical equipment are peelers, mincers, mixers, refrigerators, dish-washers. Utensils and small equipment are pots, pans, whisks, bowls, spoons.

Fuels are those substances that when oxidized give rise to heat energy. This heat energy can be converted to other forms of energy like electricity or mechanical energy like vehicle motion. Thus fuels form a very basic and important component in our lives. Fuels can be divided into categories such as primary and secondary fuels. Primary fuels are fuels that directly produce heat on ignition are called primary type of fuels. They are raw fuels. Examples are wood, coal, petroleum, natural gas, animal dung, etc. Secondary fuels are Fuels that are processed and prepared from raw or primary fuels are called secondary type of fuels. Examples are charcoal, coke, petrol, diesel, kerosene, coal gas, gobar gas, water gas.

## 12.9 LESSON END ACTIVITY

1. Familiarise yourself with various kitchen equipment, their functions and how they are used in cooking.
2. Make an inventory of kitchen utensils available in the kitchen and comment on the sufficiency or insufficiency and your suggestions to correct the deficiency if any.

## 12.10 KEY WORDS

**Charcoal** A black, porous, carbonaceous material, 85 to 98 percent carbon, produced by the destructive distillation of wood and used as a fuel, filter, and absorbent.

**Thermostat** A device, as in a home heating system, a refrigerator, or an air conditioner, that automatically responds to

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temperature changes and activates switches controlling the equipment.

**Canteen** originally meant a place on a military establishment where soldiers could get refreshments. It continues to be used in this sense to indicate places of work where food etc. is provided from a central servery.

**Sterilization** is used principally to prevent spoilage of food and other substances and to prevent the transmission of diseases by destroying microbes that may cause them in humans and animals. Microorganisms can be killed either by physical agents, such as heat and irradiation, or by chemical substances.

### 12.11 QUESTIONS FOR DISCUSSION

1. Explain briefly the various kitchen equipments used.
2. What are the two categories of heat transfer in cooking?
3. Name the commonly used energy in cooking.
4. How heat is generated for cooking? Name the various systems used.

### CHECK YOUR PROGRESS - ANSWER

1. i) oven  
ii) thermostatic  
iii) hot-cupboards  
iv) Cheesecloth  
v) Liquefied Petroleum Gas
2. i) True  
ii) False  
iii) True  
iv) True  
v) True

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## LESSON 13

### KITCHEN ORGANISATION

CONTENTS	
13.0	Aims and Objectives
13.1	Introduction
13.2	Kitchen Brigade
13.3	Duties and Responsibilities of Kitchen Staff
	13.3.1 Executive Chef
	13.3.2 Sous Chef
	13.3.3 Expediter or Announcer (Aboyeur)
	13.3.4 Chef de Partie
	13.3.5 Kitchen assistants
13.4	Let us Sum Up
13.5	Lesson End Activity
13.6	Key Words
13.7	Questions for Discussion
13.8	References

#### 13.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Kitchen Brigade
- Duties and Responsibilities of Kitchen Staffs

#### 13.1 INTRODUCTION

The staff in kitchen needs to be able to prepare, at any given moment, a wide number of items. The size of the kitchen staff can range from one person to a large group, classically known as the brigade. The size of the kitchen staff is determined equally by the number of meals the restaurant commonly serves and how extensive the menu is. The number of people actually employed in a kitchen will vary greatly from one operation to the next such as breakfast, lunch, dinner, bonquet, etc.

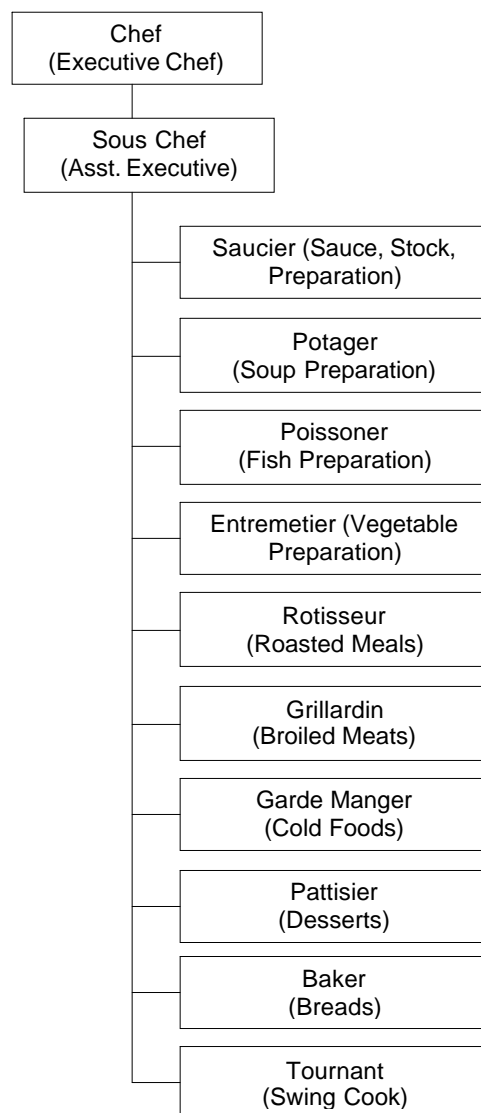
Georges Auguste Escoffier, a French chef, restaurateur and culinary writer popularized and updated traditional French cooking methods. He organized his kitchens by the brigade system, with each section run by a chef de partie. In this system everybody had a distinct task, which meant that no one duplicated anyone else's work. This system provided efficiency, economy, safety and an esprit de corps.



Many establishments today are far from modest in scope, and the lack of skilled workers in all of these distinct areas, along with technological advances that call for a certain consolidation, has modified the brigade system substantially. It is important, however, to understand the hierarchy that Escoffier formulated, because that will give you a good overview of just about every task that might be faced in the universe we call “the kitchen”.

### 13.2 KITCHEN BRIGADE

Brigade de cuisine is a system of hierarchy found in restaurants and hotels in France that employ extensive staff and are commonly referred to as kitchen staff in English speaking countries. This structured team system delegates responsibilities to different individuals that specialize in certain tasks.



**Note:** The lead person in each kitchen section was called the chef de partie and had commis (cooks or helpers): premier commis (station cook), deuxieme commis (cook’s helper) and troisiem commis (cook’s helper assistant).

Figure 13.1 Kitchen Brigade

Below is an exhaustive list of different members of the kitchen brigade system. Only the largest of establishments would have an extensive staff of this size. As noted under certain titles, certain positions are combined into other positions when such a large staff is unnecessary.

### **13.3 DUTIES AND RESPONSIBILITIES OF KITCHEN STAFF**

#### **13.3.1 Executive Chef**

The executive chef is in charge of everything related to the kitchen, including menu creation, staff and business management aspects. While the position requires extensive cooking experience and often involves actively cooking, the staff of benefit, it also involves a high level of management and business skills of the kitchen. They can also be referred to as the "chef" or "head chef". Although "head chef" may seem redundant, the word "chef" has come to be applied to any cook, kitchen helper or fast food operator, making the distinction necessary.

##### **Responsibilities of Executive Chef:**

- Full supervision of kitchen brigade
- Kitchen staff recruitment and training
- Menu planning
- Supervision of inventory and stock control
- Maintaining budgetary targets
- Supervision of health & safety (HACCP)

#### **13.3.2 Sous Chef**

The sous-chef de cuisine (Deputy-chef of the kitchen) is the direct assistant of the executive chef and is second in command. He may be responsible for scheduling, and filling in for the executive chef when he or she is off-duty. The Sous Chef will also fill in for or assist the chef de partie (line cooks) when needed. Smaller operations may not have a sous chef, while larger operations may have multiple. The term "sous-chef" is pronounced like "su chef". Some sous chefs act as an expeditor. This means that they serve as the liaison between the restaurant's customers and its line cooks. They deal with complaints regarding food quality. They also are in charge of coordinating cooking so that the wait staff delivers all food to the customers in a timely fashion and so that everyone sitting at a table is served at the same time.

##### **Responsibilities of Sous Chef:**

- Supervising the kitchen staff
- Preparing and cooking meals to order
- Demonstrating cooking techniques and proper equipment usage to the kitchen staff
- Some menu planning
- Some ordering of food and kitchen supplies

### 13.3.3 Expediter or Announcer (Aboyeur)

The expediter takes the orders from the dining room and relays them to the stations in the kitchen. This person also often puts the finishing touches on the dish before it goes to the dining room. In some operations this task may be done by either the executive chef or the sous chef.

### 13.3.4 Chef de Partie

A chef de partie, also known as a "station chef" or "line cook", is in charge of a particular area of production. In large kitchens, each station chef might have several cooks and/or assistants. In most kitchens however, the station chef is the only worker in that department. Line cooks are often divided into a hierarchy of their own, starting with "First Cook", then "Second Cook", and so on as needed.

**Chef Saucier (sauce chef)** is responsible for all sautéed items and their sauce. This person prepares sauces, stews and hot hors d'oeuvres and sautés food to order. Although it is the highest position of the station cooks, the saucier is still considered subordinate to the chef and the sous-chef.

**Chef Entremetier** prepares hot appetizers and often prepares the soups, vegetables, pastas and starches. In a full brigade system a potager would prepare soups and a legumier would prepare vegetables. Chef entremetier is also responsible for peeling and cutting vegetables.

**Chef Garde Manger (Larder)** is a French term meaning "keeping to eat" or "keeper of the food", refers to the task of preparing and presenting cold foods. These typically include such food items as salads, hors d'oeuvres, cold soups, aspics, and charcuterie. Larger restaurants and hotels may have the need for the garde manger to perform additional duties, such as creating decorative elements of buffet presentation like table arrangements and edible centerpieces made from materials such as ice, cheese, butter, salt dough or tallow. In most modern kitchens however, the garde manger is synonymous with pantry chef, having duties focusing on salads, soups, cold food items, and dessert platings. It is usually the entry-level line cook position within a restaurant.

**Chief Butcher** is responsible for the preparation of meat. The butcher has the techniques of cutting, slicing and removing the bones from the meat.

**Chef Poissonnier** prepares fish dishes and often does all fish butchering as well as appropriate sauce. This station may be combined with the saucier position.

**Chief Steward** is responsible for the washing of dishes and cleanliness of the kitchen and looking for the good hygiene.

**Pastry Chef (Pâtissier)** is a station chef in a professional kitchen, skilled in the making of pastries, desserts, and

other baked goods. The responsibilities of a pastry chef can include duties such as menu planning, costing, and ordering. Day-to-day operations can also require the pastry chef to research recipe concepts and develop and test new recipes. The pastry chef is often in charge of the dessert menu, which besides traditional desserts may include dessert wines, specialty dessert beverages, and gourmet cheese platters.

**Chief Baker** is responsible for the supervision of the baker staff as directed by the Pastry Chef Supervisor. Assists in the preparation and cooking of all bakery products, follow the HACCP procedures as set by the company.

**Chef Tournant** is responsible to replace those who are absent. Have to know a bit of all work to be able to replace them.

### 13.3.5 Kitchen Assistants

- An apprentice or (commis) in larger kitchens would work under a chef de partie or station chef in order to learn the station's responsibilities and operation.
- A communard would be in charge of preparing the meal for the staff during a shift. This meal is often referred to as staff or family meal.
- The escuelerie-dishwasher is the keeper of dishes, having charge of dishes and keeping the kitchen clean.

## CHECK YOUR PROGRESS

### 1. Fill in the blanks

- i) A chef de partie, also known as a ..... or .....
- ii) ..... prepares fish dishes
- iii) ..... prepares hot appetizers
- iv) ..... is responsible to replace those who are absent

### 2. True or False

- i) The sous-chef de cuisine (Deputy-chef of the kitchen) is responsible for all sautéed items and their sauce
- ii) The expediter takes the orders from the dining room and relays them to the stations in the kitchen
- iii) Chef Poissonnier prepares fish dishes
- iv) Chief Steward is responsible for the washing of dishes and cleanliness of the kitchen

## 13.4 LET US SUM UP

Georges Auguste Escoffier a French chef, restaurateur and culinary writer organized his kitchens by the brigade system, with each section run by a chef de partie. In this system everybody had a

distinct task, which meant that no one duplicated anyone else's work.

This brigade system provides efficiency, safety and an esprit de corps. Only the largest of establishments would have an extensive staff of this size. As noted under certain titles, certain positions are combined into other positions when such a large staff is unnecessary.

### 13.5 LESSON END ACTIVITY

1. Try to prepare a flow chart of the kitchen brigade relevant to your place of work and designate their responsibilities. Submit it for evaluation.

### 13.6 KEY WORDS

<b>Brigade</b>	A unit usually smaller than a division to which are attached groups and/or battalions and smaller units tailored to meet anticipated requirements.
<b>Menu</b>	A list of the dishes to be served or available for a meal.
<b>Hygiene</b>	Conditions and practices that serve to promote or preserve health.
<b>Liaison</b>	is person who maintains communication.

### 13.7 QUESTIONS FOR DISCUSSION

- 1) Explain in detail the role of station chef in food production.
- 2) Explain in your own words the system of hierarchy in hotel industry.
- 3) What is the role of Sous Chef in food production?

### CHECK YOUR PROGRESS - ANSWER

1. i) Station chef, Line cook                      iii) Chef Entremetier  
ii) Chef Poissonnier                              iv) Chef Tournant
2. i) False    iii) True  
ii) True    iv) True

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# UNIT IV







## LESSON 14

### HORS D' OEUVRE

CONTENTS	
14.0	Aims and Objectives
14.1	Introduction
14.2	Hors D'oeuvres
14.3	Types of Hors D'oeuvre
	14.3.1 Canapé
	14.3.2 Crudités
	14.3.3 Snack Food
	14.3.4 Dumplings
	14.3.5 Bruschetta
14.4	Let us Sum Up
14.5	Lesson End Activity
14.6	Key Words
14.7	Questions for Discussion
14.8	References

#### 14.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Hors d'oeuvres
- Type of hors d'oeuvres

#### 14.1 INTRODUCTION

Hors d'oeuvres are finger foods usually served prior to a meal, or inbetween mealtimes, and are also called Appetizers, antipasti, or starters, and may range from the very simple to the very complex, depending on the occasion and the time devoted to making them. They're a common accompaniment to aperitifs, cocktails served prior to a meal. The origin of hors d'oeuvres has been traced back to Romans who enjoyed eating spicy foods before a big dinner.

At dinners, banquets and the like, Hors d'oeuvres may be served prior to a meal. This is especially common at weddings, when it takes time for the wedding party and guests to get to a reception after the marriage has taken place.

Hors d'oeuvres may be served at long parties that occur after a regular meal time. A mid-afternoon party where there is no intent to serve dinner, or an evening party that occurs after dinner may feature appetizers so that guests can have the opportunity to snack. It is an especially a good idea when guests are consuming alcohol,

since they help to cut down on alcohol absorption. Additionally, many restaurants feature a range of appetizers that are ordered just prior to a meal as a first course.

Some common examples of hors d'oeuvres include crudites, cheese plates, fruit plates, toasted nuts, tartines with various toppings, small tarts, and stuffed vegetables. Many of these hors d'oeuvres are easy to make, while others require some more preparation. In most cases, the hors d'oeuvres are set on on large platters next to smaller dishes with tongs so that guests can take their own. Generally, hors d'oeuvres are eaten with the fingers, although guests who are seated to eat may use utensils. At a dinner party, finger bowls are offered before the meal and again after the hors d'oeuvres so that guests can cleanse their hands.

## 14.2 HORS D'OEUVRES

Hors d'oeuvres are small bite sized foods usually served cold before a main meal to whet the appetite or sustain guests through a long cocktail hour. They are sometimes referred to as appetizers, and usually appear in addition to a main meal although cocktail parties and receptions sometimes serve hors d'oeuvres exclusively. Hors d'oeuvres can take many forms from the simple to the elaborate, and most parties feature a wide spread which is designed to entice guests with a variety of tastes and food preferences.

The phrase “hors d'oeuvres” is taken from the French, and when translated literally, it means “before the work,” in a reference to the main meal. At a well balanced meal, hors d'oeuvres will not overwhelm diners, but rather provide small and interesting bursts of flavor in the mouth which do not ruin the appetite for the main meal. When hors d'oeuvres are being served alone at a party, they are sometimes more substantial so that guests do not drift away in search of other food. Parties held late at night may also offer Hors d'oeuvres rather than regular dishes, so that guests do not go to sleep weighed down with heavy foods.

A crudite platter is a simple and delicious hors d'oeuvre which cooks at all levels of experience can make. Basic crudites consist of a spread of fresh vegetables attractively laid out around a dish of dip or spread. Some crudites use more than one dip, and flavors like roasted bell pepper, goat cheese, anchovies, and curry can all be used in dips for crudites, along with many others. Tartines, also known as canapes, are small toasts which are topped with ingredients like marinated tuna, anchovy paste, cheeses, and others. Other prepared hors d'oeuvres include roasted figs stuffed with cheese, fruit wrapped in prosciutto, and other elaborate food constructions.

## 14.3 TYPES OF HORS D'OEUVRE

Hors d'oeuvres are meant to stimulate the appetite, so the presentation and taste is very important. They should be tasty and appealing. Hors d'oeuvre includes the following types:

1. Canapés
2. Crudités
3. Snack foods
4. Dumplings
5. Bruschetta

### 14.3.1 Canapés

A canapé or canape is a small, prepared and usually decorative food, held in the fingers and often eaten in one bite. Because they are often served during cocktail hours, it is often desired that a canapé be either salty or spicy, in order to encourage guests to drink more. A canapé may also be referred to as finger food, although not all finger foods are canapés. Crackers or small slices of bread or toast or puff pastry, cut into various shapes, serve as the base for savory butters or pastes, often topped with a "canopy" of such savory foods as meat, cheese, fish, caviar, foie gras, purees or relish.



Figure 14.1 Canpés

Traditionally, canapés are built on stale white bread (though other foods may be used as a base), cut in thin slices and then shaped with a cutter or knife. Shapes might include circles, rings, squares, strips or triangles. These pieces of bread are then prepared by deep frying, sautéing, or toasting. The foods are sometimes highly processed and decoratively applied (i.e. piped) to the base with a pastry bag. Decorative garnishes are then applied. The canapés are usually served on a canapé tray and eaten from small canapé plates. The technical composition of a canapè consists of a base (i.e. the bread or pancake), a spread, a main item, and a garnish. The spread traditionally is either a compound butter or a flavored cream cheese. Common garnishes can range from finely chopped vegetables, scallions, and herbs to caviar or truffle oil.

### 14.3.2 Crudités

Crudités are traditional French appetizers comprising grated raw vegetables soaked in vinaigrette. Crudités often include carrot sticks, pepper strips, celery sticks, and asparagus spears.

The French word "crudité" originates in much the same way as the English word "crude," simply means raw.



Figure 14.2 Crudités

### 14.3.3 Snack Food

A snack food (commonly shortened to snack) is prepared simply from ingredients commonly available in the home, often leftovers, sandwiches made from cold cuts, nuts, fruit, and the like.

With the multiplication of convenience stores, packaged snack foods are now a significant business. Snack foods are typically designed to be portable, quick and satisfying. Processed snack foods are designed to be less perishable, more durable, and/or more appealing than prepared foods. They often contain substantial amounts of sweeteners, preservatives, and appealing ingredients such as chocolate, peanuts, and specially designed flavors (such as flavored crisps (potato chips)).



Figure 14.3 Snacks

Types of snack foods include:

- 1) Chips and Crisps: cheese puffs/cheese curls, pretzels, potato chips, pork rinds, tortilla chips, corn chips.
- 2) Candy and Sweets: chocolate bars, jelly beans, gumdrops, hard candy.
- 3) Other snack foods: jerky, crackers, cookies/biscuits, doughnuts, mixed nuts, peanuts, popcorn, trail mix, fruits, vegetables.

- 4) International snacks: Pocky, Hello Panda, Calbee Shrimp Chips.

Hors d' oeuvre

#### 14.3.4 Dumplings

Dumplings may be any of a wide variety of dishes, both sweet and savoury, in several different cuisines. They are either made from balls of dough or are small parcels of food encased in pastry, dough, batter, or leaves. After being encased in pastry, dough or leaves, they usually undergo a further treatment by steaming them or submerging them in boiling oil. Several dishes which could be characterised as dumplings are:

- 1) Samosas generally consist of a fried triangular pastry shell stuffed with potatoes, onions and peas, minced meat, or in some cases cheese or a sweet filling (often coconut-based).
- 2) Shingaras are similar to samosas, except that the outer shell is generally round rather than triangular, and thicker.
- 3) "Karanji" are sweet dumplings made of wheat flour and stuffed with dry coconut delicacies, and are a popular dish among the Maharastrians and the South Indians.



Figure 14.4 Dumplings

- 4) "Kozhukottai" (Tamil) or "Modagam" or "Kajjikayi" (Telugu), are another south Indian dish which can be either sweet, salty or spicy. But the outer shell remains the same: steamed sticky rice dough. In the sweet version, a form of sweet filling made with coconuts, boiled lentils and jaggery is used, whereas in the salty version, a mixture of steamed cracked lentils, chillies and some mild spices are used.
- 5) Gnocchi is an Italian dumpling which literally means "lumps". They can be made of potato, semolina (durum wheat), flour, or ricotta cheese (with or without spinach). Certain varieties of filled ravioli may also resemble dumplings.

- 6) Fried Japanese dumplings made from eggs and eaten with dashi are known as akashi.
- 7) Mänti is a steamed dumpling in Kazakh cuisine. It is a spiced mixture of ground lamb (or beef) spiced with black pepper, enclosed in a dough wrapper. Mänti is cooked in a multi-level steamer and served topped with butter, sour cream, or onion sauce.
- 8) The jiaozi is a Chinese dumpling which generally consists of minced meat and chopped vegetables wrapped into a piece of dough. Popular meat fillings include ground pork, ground beef, ground chicken, shrimp, and even fish.

#### 14.3.5 Bruschetta

Bruschetta consists of grilled bread rubbed with garlic and topped with extra-virgin olive oil, salt and pepper. Variations may include toppings of spicy red pepper, tomato, vegetables, beans, cured meat, and/or cheese; the most popular American recipe involves basil, fresh mozzarella, and tomato. Bruschetta is usually served as a snack or appetizer. In Italy, Bruschetta is often prepared using a brustolina grill.



Figure 14.5 Bruschetta

### CHECK YOUR PROGRESS

1. Fill in the blanks
  - i) During drinking parties, Hors d'oeuvres can help cut down .....
  - ii) Hors d'oeuvres are small ..... foods.
2. What is meant by Hors d'oeuvres?
3. What are the common examples of Hors d'oeuvres?
4. Basic crudite consists of what?
5. Name a few ingredients used in the preparation of dips.
6. What are tartines or canapés?



#### 14.4 LET US SUM UP

Hors d'oeuvres are small bite sized foods usually served cold before a main meal to whet the appetite or sustain guests through a long cocktail hour. They are sometimes referred to as appetizers, and usually appear in addition to a main meal although cocktail parties and receptions sometimes serve hors d'oeuvres exclusively. Hors d'oeuvres can take many forms from the simple to the elaborate, and most parties feature a wide spread which is designed to entice guests with a variety of tastes and food preferences.

Hors d'oeuvre are meant to stimulate the appetite, so the presentation and taste is very important. They should be tasty and appealing. Hors d'oeuvre include the following types: Canapés, Crudités, Snack foods, Dumplings, Bruschetta.

#### 14.5 LESSON END ACTIVITY

1. Visit a popular restaurant in your locality, note down the appetizers available in their menu.
2. Try preparing a simple dumpling of your region.

#### 14.6 KEY WORDS

<b>Aperitif</b>	An alcoholic drink taken as an appetizer before a meal.
<b>Banquet</b>	A ceremonial dinner honoring a particular guest or occasion.
<b>Cocktail</b>	Any of various mixed alcoholic drinks consisting usually of brandy, whiskey, vodka, or gin combined with fruit juices or other liquors and often served chilled.
<b>Tuna</b>	is an important commercial fish.
<b>Anchovy</b>	a small, herringlike marine fish widely used in appetizers and various dishes.
<b>Prociutto</b>	An aged, dry-cured, spiced Italian ham that is usually sliced thin and served without cooking.
<b>Vinaigrette</b>	One of the four "mother sauces," vinaigrette is a basic oil-and-vinegar combination, generally used to dress salad greens and other cold vegetable, meat or fish dishes.
<b>Mozarella</b>	soft white curd cheese, mainly used as a topping for pizza, may also be eaten uncooked.
<b>Pretzel</b>	A glazed, brittle biscuit that is usually salted on the outside and baked in the form of a loose knot or a stick.

### 14.7 QUESTIONS FOR DISCUSSION

1. What are the types of Hors d'oeuvres?
2. What are canapés?
3. What is the technical composition of canapé?
4. What are crudités?
5. What are the types of snack foods?
6. What are dumplings? How they are made?
7. Give some examples of dumplings.
8. How bruschetta is made?

### CHECK YOUR PROGRESS - ANSWER

1. i) alcohol absorption  
ii) bite sized
2. They are finger foods served prior to or in between meal time. They are also called as appetizers, antipasti and starters.
3. Crudites, cheese plates, fruit plates, toasted nuts, tartines, small tarts and stuffed vegetables.
4. Spread of fresh vegetables attractively laid out around a dish of dip or spread.
5. Roasted bell pepper, goat cheese, anchvries, curries and many others.
6. Small toasts topped with spreads like marinated tuns, anchvry paste, cheese sauces, etc.

### 14.8 REFERENCES

1. Elizabeth David ( 1999), French Provincial Cooking, Penguin Classics, London.
2. Brigit Legere Binns (2001), Hors D'oeuvre, Simon & Schuster Publishers, London.
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# LESSON 15

## SOUPS

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### 15.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Soup
- Types of Soups

### 15.1 INTRODUCTION

Soup is immensely popular. It is warm and nourishing. It is perhaps the ultimate comfort food complete with childhood memories of blustery winter days. It is the age-old remedy of choice for soothing a sore throat. Each country has its own distinctive soup(s) ranging from Chinese hot and sour to Polish duck blood soup. From the four star restaurant to the country diner, soup is featured on just about every menu.

Food historians tell us the history of soup is probably as old as the history of cooking. The act of combining various ingredients in a large pot to create a nutritious, filling, easily digested, simple to make/serve food was inevitable. This made it the perfect choice for

both sedentary and travelling cultures, rich and poor, healthy people and invalids.

Soups were easily digested and were prescribed for invalids since ancient times. The modern restaurant industry is said to be based on soup. Restoratifs (wheron the word "restaurant" comes) were the first items served in public restaurants in 18th century Paris. Classic French cuisine generated many of the soups we know today.

Advancements in science enabled soups to take many forms; portable, canned, dehydrated, microwave-ready. "Pocket soup" was carried by colonial travellers, as it could easily be reconstituted with a little hot water. Canned and dehydrated soups were available in the 19th century. These supplied the military, covered wagon trains, cowboy chuck wagons, and the home pantry. Advances in science also permitted the adjustment of nutrients to fit specific dietary needs (low salt, high fiber, etc.).

## 15.2 SOUP

The word 'soup' comes from the Latin 'suppare', which means 'soaking', and once described a dish of meat or vegetables that was soaked in the liquid in which it was cooked. Stock is the foundation of all good soups. Soups are made from meat stock. Meat stock is a broth made by cooking meat with water and it requires long, slow cooking. Beef, veal, lamb or chicken can be cooked separately or in combinations.

Soups are served all over the world, and they are wonderful time-savers and appetite satisfiers. Soup may be served as an appetizer, to stimulate the appetite, or it may be served as the main dish of the meal. If the soup to be served is a hot soup, it must be served piping hot. If it is to be a cold soup, it must be served icy cold.

## 15.3 TYPES OF SOUPS

Soups are classified according to their method of preparation. Traditionally, soups are classified into two broad groups: clear soups and thick soups. The established French classifications of clear soups are bouillon and consommé.

Thick soups are classified depending upon the type of thickening agent used: purées are vegetable soups thickened with starch; bisques are made from puréed shellfish thickened with cream; cream soups are thickened with béchamel sauce; and veloutés are thickened with eggs, butter and cream. Other ingredients commonly used to thicken soups and broths include rice, flour, and grain.

One of the first types of soups can be dated to about 6000 B.C. Boiling was not a common cooking technique until the invention

of waterproof containers (which probably came in the form of pouches made of clay or animal skin) about 9,000 years ago.

Type of soup	Classification	Named soups
<b>CLEAR</b>	Consommé	Consommé Chicken noodle soup
	Bouillon	Pot-au-feu
	Broth	Minestrone Scotch Broth
<b>THICK</b>	Puree	Pumpkin Pea and Ham
	Cream	Cream of mushroom Cream of tomato Cream of cauliflower
	Velouté	Veloute Andalouse
	Bisque	Lobster bisque Yabby bisque Prawn bisque
	Brown	Kidney
<b>SPECIAL &amp; INTERNATIONAL SOUPS</b>	Miscellaneous	Mulligatawny
	Cold	Vichyssoise Gazpacho Cherry
	Speciality	Congee Avgolemono
	International	Miso Laksa French onion Cock-a-Leekie Fish Chowder Sweet corn Chowder

### 15.3.1 Thin Soups

Clear soups run the gamut--from the rustic and homey chicken soup to the most sophisticated consommé. What separates clear from thick soups is that clear soups are comprised of a clear brothy liquid with things floating in it, like pieces of vegetables, meat, fish, rice, pasta, etc. while thick soups have items ground into a stock. The amount of garnish (the professional term for the "things" floating) in a clear soup varies considerably. Some are virtually garnishless while others are loaded with solids.

- 1) **Consommé** - This is a clear soup made from a well-flavoured stock that is cleared by the action of egg white protein

(albumen) and meat protein which rise to the surface during cooking, bringing insoluble particles with them. When cool, the coagulated protein is carefully strained off and the resulting stock should be crystal clear. Consommé may be garnished in numerous ways and should be served very hot or chilled. The stocks used are either chicken, beef or game. They should be free from fat globules and thoroughly strained before being used in the preparation of consommé.

- 2) **Bouillon** - It is usually made by the simmering of Mirepoix and aromatic herbs (usually a bouquet garni) with either beef, veal, or poultry bones in boiling water.
- 3) **Broths** - These consist of a good flavoured stock containing diced meat or vegetables. They are thickened by the starch from either pearl barley or rice that is cooked with the other ingredients in the stock. As this soup is not passed in any way it is essential to have a neat brunoise cut of vegetables and finely diced meat. The stock should be well flavoured and be of the same type as the diced meat. Broths is a substantial nourishing food because of the cereal, meat and vegetable content, and are normally garnished with freshly chopped parsley, mint or coriander leaves.

### 15.3.2 Thick Soups

Soups made without meat stock and milk or cream. These soups are called cream soups and have for their basis white sauce. They are made by combining thin white sauce with cooked, mashed or strained vegetable, fish or meat pulp.

- 1) **Purée Soups** - Purée soups are another type of substantial or filling soup because they are based upon vegetables like broths, these potages are substantial soups because of their high vegetable content. Puree soups are passed through a conical strainer. The resulting soup should be smooth and thick enough to coat the back of a spoon, while still being able to pour from a ladle. After reheating and seasoning, the purée soup is served with croutons as their accompaniment. Soups can be made from one main vegetable, such as lentils for a purée of lentil soup. Other vegetables are included in smaller proportions for flavouring purposes, these usually include onion, celery, leek, carrot, swede or a combination of some of these vegetables. A purée soup is prepared by cooking all the vegetables previously diced in a good flavoured white stock. When the vegetables are cooked, the soup is passed through a sieve or liquidized, then croutons as an accompaniment.
- 2) **Veloute Soup** - Velouté soup is a lighter richer soup than broth, potages and purée soups. These soups are made using a blond roux and white stock with a few base vegetables for flavouring.. The base vegetables are diced and sweated in fat until softened, but not coloured. The flour is then added and a blond roux is made. The well flavoured white stock is added and, after bringing to the boil, the soup

is simmered for 40-50 minutes. The type of stock used will depend upon the type of soup that is being prepared. For example, if a chicken velouté is being prepared, then chicken stock is used and diced chicken will be added for garnish just before service. After being simmered, the soup is passed through a fine strainer, reheated, and then checked for consistency and flavour. To finish the velouté soup, cream or milk is often added just before service and an appropriate garnish is added.

- 3) **Cream Soup** - A cream soup is a smooth, rich soup that has a definite main ingredient and flavour. It is a soup that has been made from another base soup. For example, it can be made from any of the three following methods, a puree base that is finished with milk to create a creamy texture; a puree base that is combined with a thin, béchamel sauce to create a creamy based soup of a lighter texture than full puree soup; and a veloute base that is finished with the addition of a cream and egg yolk liaison to create a creamy, rich soup (care must be taken when adding the liaison).
- 4) **Bisque** - It is a thick, creamy, highly-seasoned soup of French origin, classically of puréed crustaceans. It can be made from lobster, crab, shrimp or crayfish. Bisque is also sometimes used to refer to cream-based soups that do not contain seafood, in which the ingredients are pureed or processed in a food processor or a food mill. Common varieties include tomato, mushroom, and squash bisque.

### 15.3.3 Special & International Soup Varieties

- 1) **Cold Soups** – Cold soups and creams are top stars in the summer. Light and cool, flavorful, packed with vitamins. The right appetizer for a summer meal. The king of cold soups is gazpacho. This Spanish soup has multiple variations, but the famous tomato-based gazpacho is made with stale bread, olive oil, garlic, ground almonds and vinegar. This ancient soup is called *ajo blanco*, a "white gazpacho." Vichyssoise is another cold savory soup made of pureed potatoes and leeks, the soup is enriched with a swirl of cream before serving.
- 2) **International Soups** – There are many varieties, cold or hot, thin or thick soups. They have been placed in a special category, as they have different origins. There are soups that originated in a certain locality and are associated with that particular place. Chowder is any of a variety of soups, enriched with salt pork fatback and thickened with flour, or more traditionally with crushed ship biscuit or saltine crackers, and milk. To some Americans, it means clam chowder, made with cream or milk in most places, or with tomato as "Manhattan clam chowder." Corn chowder is a thick soup filled with whole corn (maize) kernels. Fish chowder, along with corn and clam chowder, continues to enjoy popularity in New England and Atlantic Canada.



Seafood chowder is a traditional and popular dish in Ireland. Sometimes the freshest clam chowder can have a gritty consistency due to small particles of sand still present in the clams at the time of preparation.

## 15.4 PREPARATION OF SOUPS

### 15.4.1 Preparation of Cream of Carrot Soup

Cream of Carrot Soup	
Carrots	8 Nos.
Celery, chopped	2 stalks
Bay leaf	1
Chicken broth	3 cups
Salt	½ tsp
Freshly ground pepper	1/8 tsp
Heavy cream	¾ cup
Egg yolk, beaten	1
<ol style="list-style-type: none"> <li>1. Scrape the carrots and slice them.</li> <li>2. Combine with the celery, bay leaf, chicken broth, salt and pepper. Bring to a boil and simmer until the carrots are tender. Do not overcook. Remove the bay leaf.</li> <li>3. Force the mixture through a food mill or puree in an electric blender. Return the mixture to the saucepan and bring to a boil.</li> <li>4. Remove from heat and add the heavy cream and egg yolk. Reheat but do not boil.</li> </ol>	

### 15.4.2 Preparation of Chicken Soup

Cream of Carrot Soup	
Chopped & Cooked chicken meat	4 cups
Chopped celery	1 cup
Chopped carrots	¼ cup
Chopped onion	¼ cup
Butter	¼ cup
Egg noodles	200 gms
Water	12 cups
Chicken bouillon	9 cubes
Dried marjoram	½ tsp
Ground black pepper	½ tsp
Bay leaf	1
Dried parsley	1 tbsp
<ol style="list-style-type: none"> <li>1. In a large stock pot, saute celery and onion in butter or margarine.</li> <li>2. Add chicken, carrots, water, bouillon cubes, marjoram,</li> </ol>	

black pepper, bay leaf, and parsley. Simmer for 30 minutes.  
 3. Add noodles, and simmer for 10 more minutes.

**15.4.3 Preparation of Mixed Vegetable Soup**

<b>Mixed Vegetable Soup</b>	
Butter	1 tbsp
Potato	100 gms
Carrot	100 gms
Onion	100 gms
Tomato	100 gms
Green peas	100 gms
Turnip	100 gms
Bay leaves	2 – 3
Ginger-garlic paste	1 tsp
Black pepper	5 – 6
Water	8 cups
Salt to taste	

1. Heat butter in a pan.
2. Fry bay leaves, ginger-garlic paste, black pepper, salt for 1/2 minute.
3. Add all the vegetables (cut into small pieces) and fry for 5 minutes.
4. Add water and bring to a boil; then reduce heat and simmer 1½ hours. As stock simmers, skim any foam from the surface and discard.
5. Sieve and serve hot.

**15.5 GARNISHING FOR SOUPS**

A simple dish can be transformed by feasting the eyes first with even the most casual of garnishing – a sprig of mint, basil or parsley can add colour and aroma which looks attractive and demonstrate a caring attitude to a meal.

- 1) One of the simplest garnishes for soup is a tablespoon of salted whipped cream sprinkled with a dash of paprika or a little parsley chopped very fine.
- 2) Eggs are used as garnishes of soups in the form of a baked custard cut in fancy shapes, or as egg balls. The whole yolks poached in salted water just below the boiling-point may be used; one yolk is served with each plate of soup.
- 3) Noodles, tapioca, spaghetti or macaroni cut in fancy shapes or quenelles make simple and attractive garnishes for soup.

- 4) Cooked vegetables cut in thin strips or in Julienne style or in fancy shapes or slices, are often used to add color flavor and nutritive value to a soup.
- 5) Soups may be garnished also with cubes of bread or puff paste buttered and browned in the oven or fried in deep fat.

Garnishes for soups needn't be complicated or time consuming, but they should meet two objectives:

- They should be pleasing to the eye, adding to the visual impact of the bowl; and
- They should be edible, complimenting rather than competing with the main flavours of the soup.

### 15.6 METHOD OF SERVING SOUP

- 1) Soup dishes are always deep.
- 2) Soup plates are used for dinner soup.
- 3) Soup bowls and cups are used for luncheon soups.
- 4) Set soup dishes on a plate slightly larger than the soup dish.
- 5) A soup spoon is smaller than a tablespoon and larger than a teaspoon.
- 6) Bouillon spoons are small round-bowled spoons.
- 7) In using a soup spoon, dip the spoon away from you. Take the soup silently with the lips from the side of the spoon and not the tip.
- 8) Do not leave spoon in soup dish. When not using it, place on the plate.
- 9) When soup is served in a bouillon cup it is customary to take a few spoonfuls and then it is permissible to set the spoon on the plate, and drink the remainder of the soup from the cup.
- 10) It is permissible to put two or three pieces of crackers or toast on top of soup.

### CHECK YOUR PROGRESS

1. Soups have universal appeal. Substantiate.
2. How soups should be served?
3. Name a few popular thin soups.

### 15.7 LET US SUM UP

Soup is immensely popular. It is warm and nourishing. The word 'soup' comes from the Latin 'suppare', which means 'soaking', and once described a dish of meat or vegetables that was soaked in the liquid in which it was cooked.

Stock is the foundation of all good soups. Soups are made from meat stock. Meat stock is a broth made by cooking meat with water and it requires long, slow cooking. Beef, veal, lamb or chicken can be cooked separately or in combinations.

Clear soups run the gamut--from the rustic and homey chicken soup to the most sophisticated consommé. What separates clear from thick soups is that clear soups are comprised of a clear brothy liquid with things floating in it, like pieces of vegetables, meat, fish, rice, pasta, etc. while thick soups have items ground into a stock. The amount of garnish (the professional term for the "things" floating) in a clear soup varies considerably. Some are virtually garnishless while others are loaded with solids.

### 15.8 LESSON END ACTIVITY

1. Prepare various soups mentioned in the lesson, taste them and note down the details.
2. Try to formulate a new version of a soup, making use of the locally available ingredients, test taste and note down the result.

### 15.9 KEY WORDS

<b>Croutons</b>	A small crisp piece of toasted or fried bread
<b>Soothing</b>	in a comforting manner
<b>Nourishing</b>	providing nutrient
<b>Garnishless</b>	to furnish without decorations

### 15.10 QUESTIONS FOR DISCUSSION

1. What are the basic or foundation ingredients in soup?
2. Name a few popular thick soups.
3. Enumerate the methods of serving soups.

### CHECK YOUR PROGRESS - ANSWER

1. Soups are perfect choice for sedentary or travelers, rich or poor and healthy or invalids.

Food Production  
and Patisserie - I

2. If it is a hot soup it should be served piping hot and if it is cold, soup should be served icy cold.
3. Consommé, bouillon, broths.

#### **15.11 REFERENCES**

1. Richard Olney (1979), Soups, Time-Life Books, London.
2. Delia Smith (2006), Soups, Dorling Kindersley, London.

## LESSON 16

### SEAFOOD COOKERY

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#### 16.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Seafood and their types
- Fish and their types
- Selecting, Cutting and Preparation of Fish
- Cooking Fish

#### 16.1 INTRODUCTION

Fish and seafood are very much of a food of the nineties, the epitome of modern cooking and eating styles – low in fat, high in protein, rich in minerals and vitamins, quick and easy to prepare and cook, versatile enough to be adapted to suit any occasion. Plus, many fish are cheaper than meat and better value for money.

Fish can be prepared using almost any type of cooking method including baking, steaming, frying, grilling, broiling, or slow cooking. When cooking fish, care must be taken not to overcook the

fillet, steak, or whole fish, which results in dry and somewhat tasteless meat. A general rule is to cook a fish 10 minutes for each inch of thickness. The 10 minute rule should not be used for deep-frying or microwaving fish. The fish should be cooked until it has reached an internal temperature of at least 145°F.

## 16.2 SEAFOOD

Fish and seafood are valuable in a balanced diet as they contain more natural goodness, weight for weight, than any other type of food. They are high in good quality protein but low in calories. All fish are rich stores of essential vitamins and minerals; fatty fish such as herrings, mackerel, tuna, sardines, and salmon are particularly good sources of vitamins A & D. They are also very easy to digest.

Oily fish is rich and a best source of omega 3 fatty acids and a good source of vitamins A and D. White fish such as cod, haddock, plaice and whiting are very low in fat. White fish contain some omega 3, but at much lower levels than oily fish.

Fish such as whitebait, canned sardines, pilchards and salmon - where you also eat the bones - are also good sources of calcium and phosphorous, which help make our bones stronger.

Shellfish contain similar nutrients to white fish and similar amounts of omega 3, though some types of shellfish contain more omega 3 than others. For example, crab and mussels are quite good sources of omega 3, but prawns contain hardly any. Shellfish are good sources of selenium, zinc, iodine and copper.

## 16.3 TYPES OF SEAFOOD

There are three basic categories of seafood: fin fish, shellfish and invertebrates. Each category can be further divided into various sub-categories.

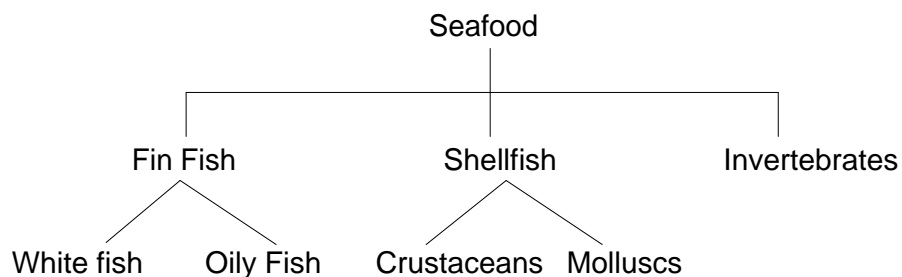


Figure 16.1 Types of Seafood

### 16.3.1 Fin Fish

Fin fish are cold-blooded vertebrates with gills. Fin fish have skin and scales which cover the body. They move with the help of fins. True fish have an internal skeleton and a backbone. Most fish have a bony skeleton but some fish like sharks have a skeleton



made up of pieces of cartilage (hard connective tissue). Fish can be divided into various sub-categories according to habitat, shape and flesh type.

### 16.3.1.1 White Fish

Fresh white fish has the following characteristics: firm flesh, clear and shiny eyes, red gills and a clean smell.

There are two types of white fish: Round fish and Flat fish.

- 1) **White Flat fish** - have white flesh and are flat. Turbot, brill and halibut are very large flat fish, but are readily available from suppliers and popular in many fine restaurants. The cuts of flat fish are different to those of round fish. This category includes the following types of fish: plaice, Dover sole, lemon sole, turbot, brill, halibut, etc.

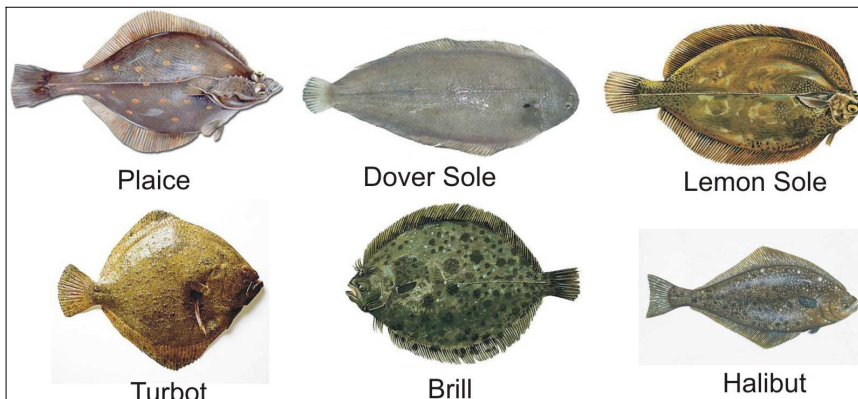


Figure 16.2 White Flat Fish

- 2) **White Round fish** - are round and are relatively common. Like flat fish, their flesh is white but the cuts are different. This category includes the following types of fish: cod, haddock, hake, huss, whiting, monkfish, etc.



Figure 16.3 White Round Fish

### 16.3.1.2 Oily Fish

All oily fish are round and the flesh is darker than that of white fish. White fish contain oil, but only in their livers, whereas oily fish have oil throughout their bodies. This category includes the following fish: salmon, trout, mackerel, tuna, herring, sardines, anchovies, etc.

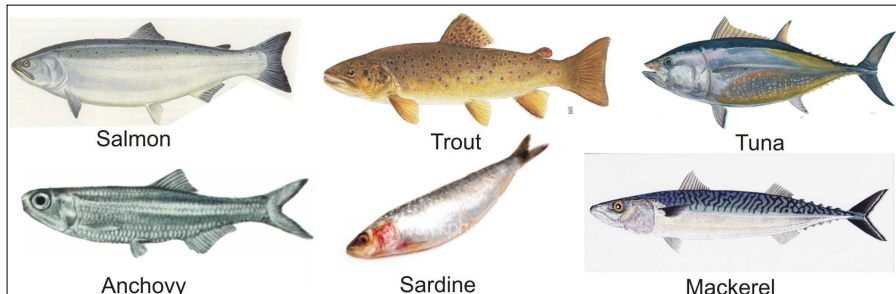


Figure 16.4 Oily Fish

### 16.3.2 Shell Fish

Shellfish are aquatic invertebrates used as food. The main difference between fish and shellfish is their skeleton. Shellfish have an external skeleton or shell. There are two main categories of shellfish, crustaceans and molluscs.

#### 16.3.2.1 Crustaceans

Crustaceans have multi-jointed shells. The shells of crustaceans do not grow with the fish, they shed each year with a new one forming to suit their new size. Examples of Crustaceans are: Lobsters, Crawfish, Prawns and Crab.

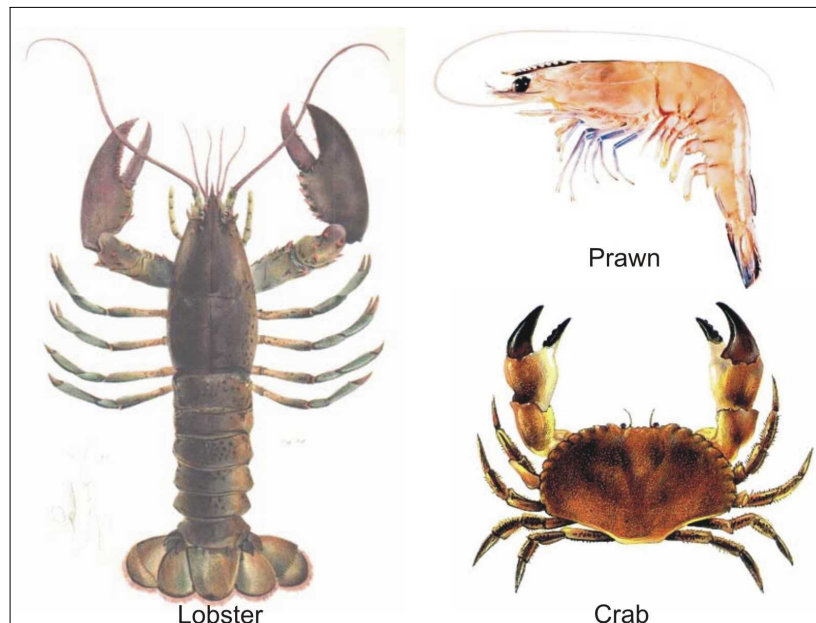


Figure 16.5 Crustaceans

### 16.3.2.2 Mollusc

Mollusc shellfish have shells but they are not multi-jointed. Some molluscs are eaten raw, such as oysters, but the remainder need very little in the way of cooking through. Too much cooking will affect their texture and taste. Examples of molluscs are: Mussels, Scallops, Oysters and Whelks.

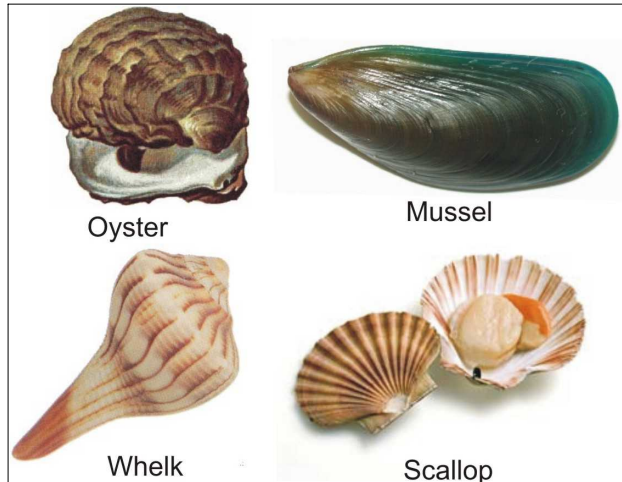


Figure 16.6 Mollusc

### 16.3.3 Invertebrates

Invertebrates are spineless marine animals with no outer shell. They include the squid and octopus family.



Figure 16.7 Invertebrates

## 16.4 SELECTING FISH

- (i) Fresh fish should be firm to the touch.
- (ii) The eyes should be clear, full and shiny – almost glistening.
- (iii) The gills should be red.

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- (iv) It should not, under any circumstances, smell 'fishy', but should have a clean, fresh smell.
- (v) When buying crab, tap it gently to make sure it doesn't contain water.
- (vi) Mussels should not be bought if their shells don't close when tapped. Discard any broken shells when cleaning.

## 16.5 PREPARATION OF FISH

The following is one of the procedures commonly used for gutting, filleting, and skinning fish:

### Gutting:

- Lay the fish on its back and open its gills. The flaps should come out gently. These need to be removed with a pair of scissors.
- Remove the fins from the fish, again, with a pair of scissors.
- Slice into the body of the fish at the bottom of its belly. Scoop out the middle – rather messy, but necessary!
- Finally, run under cold water until the water runs clear and the body cavity and outer is clean.

### Filleting:

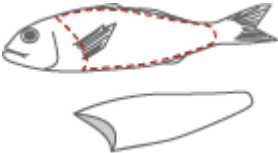


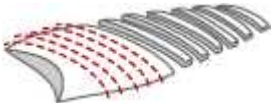
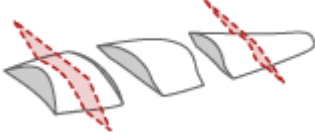
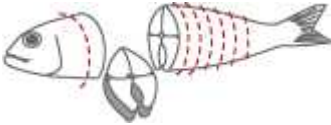
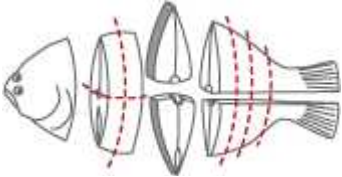
- Cut down the length of the fish at the backbone from the head to the tail, keeping the knife as close to the backbone as possible.
- Cut down the width of the fish, starting from just behind the gills. Slice underneath the flesh lengthwise towards the tail, keeping as close to the bones as possible.
- Remove the fillet just before the tail.
- Turn the fish over and repeat on the other side.

### Skinning:

- Make a cut just behind the gills, but don't cut its' head off completely.
- Drop its' head down, away from the body and scoop out its' guts.
- Wash the fish to clean out the body cavity.
- Cut along the back bone keeping the knife as tight to the bone as possible.
- Spread the fish open like opening a book, flesh side down so that you can see the supporting bone structure.
- Remove the backbone. Most of the adjoining bones will come away at the same time if it is done carefully, however a pair of tweezers and small knife will help to pull away any small 'pin' bones.

**16.6 FISH CUTS**

The following table shows some of the fish cuts commonly used in restaurants.

<p><b>Fillets</b></p> 	<p>The flesh is completely removed from the bone in long flat pieces. Round fish produce two fillets, flat fish produce four.</p>
<p><b>Delice</b></p> 	<p>A folded fillet, usually of a flat fish. It is a menu term synonymous with fillet.</p>
<p><b>Paupiette</b></p> 	<p>A rolled and stuffed fillet, usually of a flat fish. The stuffing would generally be a fine fish farce.</p>
<p><b>Goujon/Goujonette</b></p> 	<p>A fish "finger" or baton approximately 80 x 10 x 10mm, a Goujonette is smaller and may be used as a garnish.</p>
<p><b>Supreme</b></p> 	<p>A portioned piece of fish cut on the slant from the fillet of a large round or flat fish.</p>
<p><b>Darne</b></p> 	<p>Also called a steak. This is a section across a round fish cut across the backbone approximately 25 mm thick. This cut is well suited to large dark fish such as Mackerel and Swordfish.</p>
<p><b>Troncon</b></p> 	<p>This is similar to the Darne. It is a section of a large flat fish such as Turbot or Brill after being split down the backbone, approximately 45 mm thick.</p>

## 16.7 COOKING FISH

It is important to cook fin fish thoroughly, but not to overcook it. Proper cooking: develops the flavor, softens the small amount of connective tissue present in fish, and makes the protein easier to digest. Two cooking methods can toughen fin fish and destroy the natural moisture and flavor:

- cooking at too high a temperature, and
- cooking for too long a time.

Some common methods of cooking fin fish include:

- Grilling** White fish should be brushed lightly with a little oil before grilling, but oily fish needs nothing added. Make sure the grill is hot before the fish is inserted. A squeeze of lemon and seasoning is all that's needed! Very simple and fresh way to cook fish. Turn the fish over once only.
- Shallow Frying** Shallow frying is the best way to fry fish. The fish must be dried with kitchen paper, coated with beaten egg and dusted with flour. A little oil in the frying pan should be hot enough to sizzle the fish immediately it is added. This will seal the fish. If the oil isn't hot enough, the fish will taste oily and the coating will be mushy – yuck!
- Deep Frying** is usually done with battered fish. The batter is made from flour, milk, water and/or beer. The oil has to be hot enough for the fish to sizzle immediately it is added, or the same thing will occur as with shallow frying.
- Steaming** is a very healthy option which uses a steamer that sits on top of a saucepan of boiling water. The resultant taste is fresh and clean. Spices and herbs can be used in the steamer to infuse into the fish.
- Poaching** is a great way to gently cook tender and delicate fish. Many liquid flavours are used, the most popular one being white wine. Herbs and spices are often added, but care needs to be taken not to mask the taste of the fish with overpowering flavours.
- Baking** is a good way to cook fish as much of the flavour is retained. When cooked in parcels with herbs and a little wine, the flavours develop and enhance the taste of the fish. This type of baking fish is perfect for barbecuing.
- Microwaving** is easy and very quick, this method is usually done when the fish is poached in liquid. Milk works very well with salmon, as does white wine, cider or lemon juice. Be careful not to overdo the cooking time though, as the fish can quite easily become dry and overcooked.



### CHECK YOUR PROGRESS

1. How fishes are subdivided into various categories?
2. Fin fish are classified into ..... and .....
3. What are the types of white fish? Give examples.
4. Oily fish contains oil ..... and its flesh is .....
5. What are the examples of invertebrates in fishes?

### 16.8 LET US SUM UP

Fish and seafood are valuable in a balanced diet as they contain more natural goodness, weight for weight, than any other type of food. They are high in good quality protein but low in calories. All fish are rich stores of essential vitamins and minerals; fatty fish such as herrings, mackerel, tuna, sardines, and salmon are particularly good sources of vitamins A & D. They are also very easy to digest.

There are three basic categories of seafood: fin fish, shellfish and invertebrates. Fin fish are cold-blooded vertebrates with gills. Fin fish have skin and scales which cover the body. They move with the help of fins. True fish have an internal skeleton and a backbone. Fish can be divided into various sub-categories according to habitat, shape and flesh type.

Shellfish are aquatic invertebrates used as food. The main difference between fish and shellfish is their skeleton. There are two main categories of shellfish, crustaceans and molluscs.

Invertebrates are spineless marine animals with no outer shell. They include the squid and octopus family.

Two cooking methods can toughen fin fish and destroy the natural moisture and flavor: cooking at too high a temperature, and cooking for too long a time.

### 16.9 LESSON END ACTIVITY

1. Carryout the various systems of preparation of fish. Record your observations of gutting, filleting and skinning.
2. Find out the names of the popular fishes available in your local market.

### 16.10 KEY WORDS

- Epitome** A representative or perfect example of a class or type
- Omega 3** Any of several polyunsaturated fatty acids found in leafy green vegetables, vegetable oils, and fish such



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as salmon and mackerel, capable of reducing serum cholesterol levels and having anticoagulant properties.

**Invertebrate** An animal, such as an insect or mollusk, that lacks a backbone or spinal column.

**Glisten** A sparkling, lustrous shine.

**Farce** A seasoned stuffing, as for roasted turkey.

**Tweezers** A hand tool for holding consisting of a compound lever.

### 16.11 QUESTIONS FOR DISCUSSION

1. How would you select fish?
2. What affect the quality of cooked fish?
3. What are the common methods of cooking food?

### CHECK YOUR PROGRESS - ANSWER

1. Various categories of fish are based on habitat, shape and flesh type.
2. White fish, oily fish
3. Types of white fish are flat fish and round fish.
4. throughout its body, dark coloured
5. Examples of invertebrates in fishes are squid and octopus family.

### 16.12 REFERENCES

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## LESSON 17

### MEAT COOKERY

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#### 17.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Meat Cookery
- Mutton and Lamb
- Beef and Veal
- Porks, Bacon, Ham and Gammon
- Game
- Poultry and Chicken

## 17.1 INTRODUCTION

In basic food preparation, meat is generally considered to be the flesh of any animal and includes beef, veal, lamb, and pork along with poultry, fish, and shellfish. Poultry and fish, however, often differ from the red meats in preparation and tests for doneness (rare, medium and well done).

The word meat comes from the Old English word *mete*, which referred to food in general. The narrower sense that refers to meat, which does not include sea food, developed over the past few hundred years and has religious influences.

Meat, especially beef, is prepared in many ways, as steaks, in stews, fondue, or as dried meat. It may be ground then formed into patties (as hamburgers or croquettes), loaves, or sausages, or used in loose form (as in "sloppy joe" or Bolognese sauce). Some meat is cured, by smoking, pickling, preserving in salt or brine (see salted meat and curing). Other kinds of meat are marinated and barbecued, or simply boiled, roasted, or fried. Meat is generally eaten cooked, but there are many traditional recipes that call for raw beef, veal or fish. Meat is often spiced or seasoned, as in most sausages. Meat dishes are usually described by their source (animal and part of carcass) and method of preparation.

Meat is a typical base for making sandwiches. Popular varieties of sandwich meat include ham, pork, salami and other sausages, and beef, such as steak, roast beef, corned beef, and pastrami. Meat can also be molded or pressed (common for products that include offal, such as haggis and scrapple) and canned.

All muscle tissue is very high in protein, containing all of the essential amino acids, and in most cases, is a good source of zinc, vitamin B12, selenium, phosphorus, niacin, vitamin B6, iron and riboflavin. However, meat is very high in fat, low in carbohydrates, and contains no fiber. The fat content of meat can vary widely depending on the species and breed of animal, the way in which the animal was raised, including what it was fed, the anatomical part of the body, and the methods of butchering and cooking.

## 17.2 MEAT

The different types of meat discussed here are lamb, mutton, beef, veal, pork and game. In order to cook meat properly, it is important to know the composition and structure of the meat.

- 1) Meat is composed mainly of muscle fibers, which vary in size.
  - o Larger fibers indicate a naturally less tender cut of meat and small fibers indicate a more tender cut of meat. For example, a chuck steak is less tender than filet mignon.

- 2) Meat also contains connective tissue.
  - One connective tissue, **collagen**, hydrolyzes to gelatin during cooking.
  - **Elastin**, the other connective tissue, does not become more tender during cooking.
- 3) The primary nutrient found in meat is **protein**.
  - Protein is composed of amino acids, which build and maintain all tissues, forms an important part of enzymes, hormones and body fluids, and supplies energy.
  - The body can manufacture some amino acids; others are supplied only by food.
  - Excess protein is converted to fat and stored.
- 4) Other nutrients found in meat include fat, carbohydrates, vitamins, and minerals.

Meats in general are high in cholesterol than fish. In the descending order of cholesterol content, pork or products of pork in all forms are highest followed by beef, sheep / lamb and chicken.

### 17.3 MUTTON AND LAMB

The terms lamb, hogget or mutton are names for the animals or meat of a domestic sheep. The meat of a sheep a year old or younger is generally known as lamb, whereas the meat of an older sheep is either hogget or mutton depending on its age and characteristics. All of these are known generically as sheep meats.

A sheep less than one year old is known for its tender meat. Baby lamb and spring lamb are both milk fed. **Baby lamb** is customarily slaughtered at between 6 and 8 weeks old. **Spring lamb** is usually 3 to 5 months old; **regular lamb** is slaughtered under a year of age. Lamb between 12 and 24 months is called **yearling**; when over 2 years, it's referred to as **mutton** and has a much stronger flavor and less tender flesh.

#### 17.3.1 Cuts of Lamb / Mutton

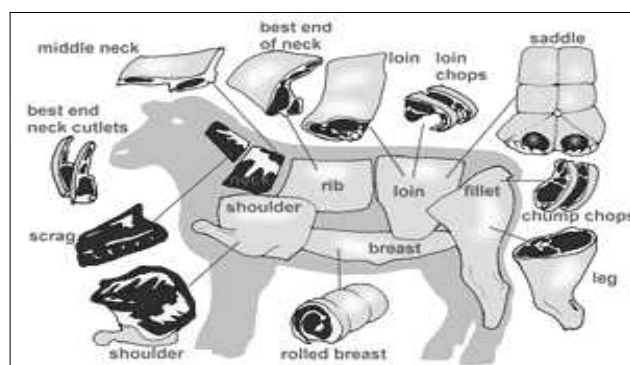


Figure 17.1 Cuts of Lamb

<b>Breast</b>	This cut is from the rib cage and is one of the cheapest cuts and whilst the price is similar to scrag end, but is much more versatile. It can be roasted on the bone, boned, stuffed and rolled, or when well trimmed, can be used for mince, burgers or skewers (kebabs). Some butchers also sell this cut in strips which are ideal for barbecues.
<b>Flank</b>	Unlike other cuts from the loin area, the flank is much tougher and is usually sold as mince meat.
<b>Foreshank</b>	Also known as Lamb shanks, this cut is suitable for slow roasting, stewing and braising. It has become very popular in recent years especially when braised when a whole shank with the bone is served per person. It is a very flavourful cut of meat.
<b>Leg</b>	This is a prime cut with little fat which is excellent for roasting as a joint. It is often cut into lamb steaks suitable for frying or grilling or into cubes for lean kebabs.
<b>Loin</b>	The loin is the most tender part of the lamb. It is from this area that loin chops come from as well as medallions, noisettes as well as roasting cuts. Suitable for roasting although the joints tend to be small unless you have a whole saddle which is made up of a double loin roast, from both sides of the backbone. Frying and grilling are excellent for the smaller cuts.
<b>Neck</b>	This is one of the tougher cuts and is generally sold as Stewing lamb or made into mince (ground) meat. When sold in pieces it is only suitable for very long, slow, moist cooking. Although tough the flavour is very good so well worth the extra cooking. Best End of neck is traditionally used for Lancashire Hotpot.
<b>Scrag</b>	Also known as scrag end or neck end, this is one of the tougher cuts and is therefore one of the cheaper ones. The meat from this area is often more fatty than other cuts and is usually sold chopped or diced for use in stews and casseroles.
<b>Rack</b>	A "rack of lamb" is the name given to the whole rib section on either side of the backbone between the shoulder and the loin. A tender and flavoursome cut, it is also expensive and it is suitable for dry heat cooking such as roasting or grilling.
<b>Shoulder</b>	Shoulder is often sold as two separate joints, blade and arm (knuckle). The whole shoulder is also sometimes called "square cut" which consists of the arm, blade, and rib bones. Shoulder meat is also often trimmed of fat and sold as cubes for curries, kebabs and casseroles. Shoulder chops are suitable for pan-frying, grilling or braising.

## 17.4 BEEF AND VEAL

Beef is the meat from bovines, especially domestic cattle. Fresh beef has cream-colored fat and bright red meat. The best beef is marbled with fine strands of fat, which bastes the meat as it cooks and makes it tender and juicy.

Veal comes from young calves, and so the meat is tender and lean and the flavor is delicate. The best way to cook veal is with moist heat, either by braising it or cooking it in a liquid. Since the meat is lean, it tends to dry out when cooked with dry heat. When selecting veal, check to make sure that the meat is moist and light pink-gray in color, that the fat is white, and that the bones are engorged with blood.

In addition to providing meat, the bones of calves are used to make a stock that forms the base for sauces and soups such as demi-glace. The stomachs are also used to produce rennet, used in the production of cheese.

### 17.4.1 Terms Used in Beef Industry

<b>Carcass</b>	Whole animal after dressing from the slaughter house.
<b>Side</b>	A carcass that has been split down the centre of the spinal column.
<b>Quarter</b>	A side that has been sub-divided into two sections as forequarters-hindquarters.
<b>Crop</b>	Fore quarters minus the plate, brisket and shin
<b>Baron</b>	A complete back (uncut) which is a pair of sirloins undivided.
<b>Offals</b>	Product derived from the process of slaughtering other than the carcass, the edible internal organs e.g. liver, heart, sweet bread, head, tongue, tail, brains, kidneys.

### 17.4.2 Cuts of Beef

<b>Neck</b>	This is one of the tougher cuts and is generally sold as Stewing Steak or made into mince (ground) meat. When sold in pieces, it is only suitable for very long, slow, moist cooking.
<b>Blade &amp; Chuck</b>	This cut is often sold as Braising Steak. A little more tender than stewing steak. Use in casseroles, stews and to braise.
<b>Fore Rib</b>	Sometimes sold boned and rolled but is traditionally sold on the bone. Has a higher fat content throughout the flesh and makes a superb roast. Can also be cut into steaks for grilling or frying.

- Thick Rib** This cut is often sold as Braising Steak. A little more tender than stewing steak. Use in casseroles, stews and to braise.
- Thin Rib** This is one of the tougher cuts and is generally sold as mince (ground) meat.
- Brisket** Often sold boned and rolled and sometimes salted. Suitable for slow or pot roasting. Traditionally used for making corned beef.

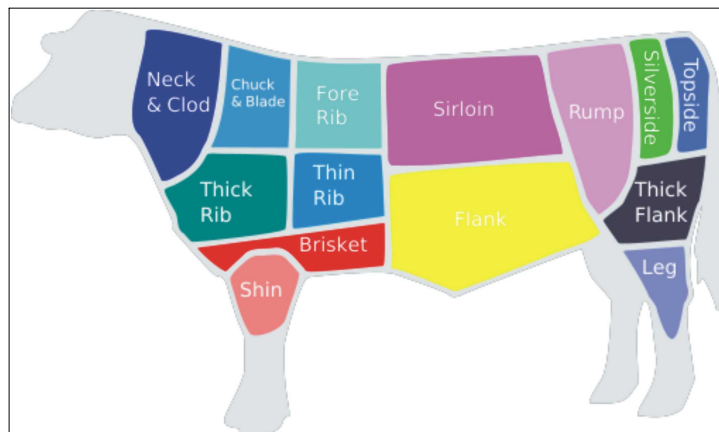


Figure 17.2 Cuts of Beef

- Shin** This is one of the tougher cuts and is generally sold as Stewing Steak or made into mince (ground) meat. When sold in pieces it is only suitable for very long, slow, moist cooking.
- Sirloin** Often sold boned and rolled. A prime cut which is suitable for roasting.
- Sirloin Steak** Comes from the same area as sirloin but cut into steaks such as "T"-bone, Porterhouse and Entrecote. A prime cut which is suitable for grilling, frying, stir-fries and barbecuing.
- Thin Flank** often used for minced or ground meat. Suitable for cottage pie, Bolognese sauce and burgers. Thin flank is also known as Top Rump. Similar to topside and can be slow roasted as a joint or slow fried or braised in pieces. Also sold as "flash fry" steaks.
- Leg** This is one of the tougher cuts and is generally sold as Stewing Steak. Only suitable for very long, slow, moist cooking.
- Silverside** Although this was traditionally salted and sold as a boiling joint, this very lean piece of meat is now most often sold unsalted as a joint for roasting. Requires frequent basting through the cooking time.
- Topside** Very lean and when sold as a joint for roasting, often has a layer of fat tied around it to help baste and keep it moist. Also suitable cut into steaks for frying or grilling and in stir-fries.



<b>Rump</b>	Although a prime cut, it is usually cheaper than fillet or sirloin because it's not quite as tender. Suitable for quick cooking e.g. frying, stir-fries, grilling or barbecuing.
<b>Shank</b>	This is one of the tougher cuts and is generally sold as mince (ground) meat.

### 17.4.3 Steaks

A steak is a slice from a larger piece of meat typically from beef. Most steaks are cut perpendicular to the muscle fibres, improving the perceived tenderness of the meat. A restaurant that specializes in beef steaks is known as a steakhouse. A typical steak dinner consists of a steak, with a starchy side dish, usually baked potatoes, but occasionally another potato dish, rice, pasta, or beans. In France, beef steak is usually served with French fried potatoes also known as "pommes frites", and the combination is known as "steak-fries". The different types of beef steaks are given below:

1. Chateaubriand steak - Usually served for two, cut from the large head of the tenderloin.
2. Chuck steak - A cut from neck to the ribs.
3. Cube steak - A cut of meat, usually top round, tenderized by a fierce pounding of a mallet.
4. Filet mignon - A small choice tenderloin, the most tender cut, less flavorful.
5. Flank steak - From the underside. Not as tender as steaks cut from the rib or loin.
6. Flat iron steak - A cut from the shoulder blade.
7. Hanger steak or (French) onglet - A steak from near the center of the diaphragm. Flavorful, and very tender towards the edges, but sinewy in the middle. Often called the "butcher's tenderloin."

Popular seak cuts of North Americans are Proster house steak, New York steak, Sirloin steak, T-bone steak, round steak, rump steak, etc. Depending on the extent of cooking, finished product is called rare, medium or well done.

## 17.5 PORK

Pork is the meat from the domestic pig (*Sus scrofa*). It is one of the most commonly consumed meats worldwide. Pork is eaten in various forms, including cooked (as roast pork), cured or smoked (ham, including the Italian Prosciutto) or a combination of these methods (gammon, bacon or Pancetta). It is also a common ingredient of sausages.

### 17.5.1 Cuts of Pork

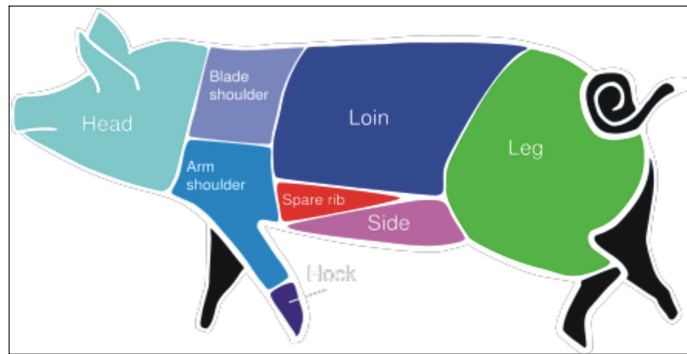


Figure 17.3 Cuts of Pork

- Head** This can be used to make brawn, stocks and soups. After boiling the ears can be fried or baked and eaten separately, which are crumchy due to corliage bones. It is considered a delicacy.
- Spare Rib** This is the shoulder and contains the shoulder blade. It can be boned out and rolled up as a roasting joint, or cured as "collar bacon". Not to be confused with the rack of spare ribs from the front belly. Boston Butt, or Boston-Style Shoulder, cut comes from this area, and may contain the shoulder blade.
- Hand / Arm** This can be cured on the bone to make a ham, or used in sausages.
- Loin** This can be cured to give back bacon or Canadian-style bacon. The loin and belly can be cured together to give a side of bacon. The loin can also be divided up into roasts (blade loin roasts, center loin roasts, and sirloin roasts come from the front, center, or rear of the loin), back ribs (also called baby back ribs, or riblets), pork cutlets, and pork chops. A pork loin crown roast is arranged into a circle, either boneless or with rib bones protruding upward as points in a crown.
- Belly** The belly, although a fattier meat, can be used for steaks or diced stir-fry meat. Belly pork may be rolled for roasting or cut for streaky bacon.
- Legs / Hams** Although any cut of pork can be cured, technically speaking only the back leg is entitled to be called a ham. Legs and shoulders, when used fresh, are usually cut bone-in for roasting, or leg steaks can be cut from the bone. Three common cuts of the leg include the rump (upper portion), center, and shank (lower portion).
- Trotters** Both the front and hind trotters can be cooked and eaten, as can the tail.
- Spare ribs** are taken from the pig's ribs and the meat surrounding the bones.

## 17.6 BACON, HAM AND GAMMON

### Bacon

Bacon is any of certain cuts of meat taken from the sides, belly or back of a pig that may be cured and/or smoked. Meat from other animals may also be cured or otherwise prepared to resemble bacon, such as beef, lamb, chicken, goat or turkey bacon. In continental Europe, it is used primarily in cubes (lardons) as a cooking ingredient valued both as a source of fat and for its flavour.

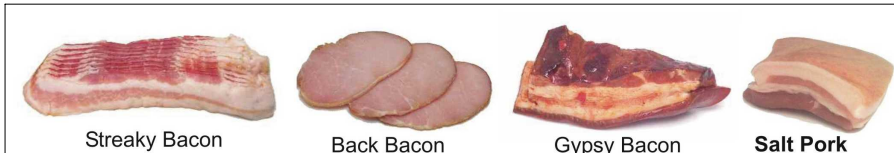


Figure 17.4 Bacon

Typical breakfast menu of North Americans, some Europeans and Australians includes orange juice, strips of sizzling bacon streps, scrambled eggs and bread toast.

### Ham

Ham is from the hind legs of the pig - there are rapid-cured and slow-cured hams. Various factors influence the flavour and texture of ham including the cut and curing process chosen, whether the meat has been dry-salted or cured in brine (and for how long), whether it has been air-dried or smoked, and the smoking medium (hickory, juniper or oak, for instance). The breed of pig can also affect the flavour.

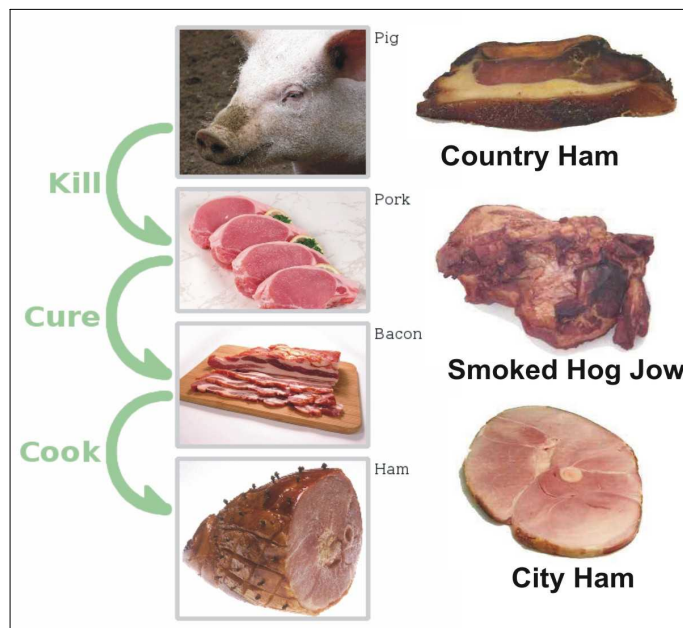


Figure 17.5 Ham

There are three types of American hams: **city hams**, **country hams** and **fresh hams**. City hams are the most common. They're soaked in brine (or injected with it) and then boiled or lightly smoked.

Many gourmets prefer country hams, which are dry-cured and then smoked and aged for added flavor. Fresh hams aren't cured at all and need to be cooked. Ham is relatively low in fat, but even low-salt hams are high in sodium.

### **Gammon**

Gammon is also from the hind legs, and is sold raw for cooking. Bacon cured using the "Wiltshire Cure" method, boned and cut into 3 Lb. joints. It can be sliced to make gammon steaks, boiled to make ham sandwiches or baked. Historically the word Gammon was used for cured whole sides of pork where the whole hog side including the hams, middle or loins, and the shoulders. In recent times the word Gammon is used mostly for the hams.

## **17.7 GAME**

Game is any animal hunted for food or not normally domesticated (such as venison). The type and range of animals inhabit and hunted for food varies in different parts of the world. This will be influenced by climate, animal diversity, local taste and locally accepted view about what can or cannot be legitimately hunted. Sometimes a distinction is also made between varieties and species of a particular animal, such as wild or domestic turkey. In Africa, wild animals hunted for their meat are called bushmeat.

As it is less fatty than poultry or meat, game is easily digested, with the exception of water fowl, which has oily flesh. Game is useful for building and repairing body tissues and for energy.

### **17.7.1 Game Varieties**

Game varieties could be broadly grouped into two: birds and animals:

**Quail** Quails have dark meat that's quite tasty. They're very lean, so they are generally barded before roasting or marinated grilling. Quail are commonly eaten complete with the bones, since these are easily chewed and the small size of the bird makes it inconvenient to remove them.

**Wild Duck** The meat of a duck is mostly on the breast and the legs. The meat of the legs is darker and somewhat fattier than the meat of the breasts, although the breast meat is darker than the breast meat of a chicken or a turkey. Being waterfowl, ducks have a layer of heat-insulating subcutaneous fat between the skin and the meat. Boneless duck breast is also called "magret" and can be grilled like steak, usually leaving

	the skin and fat on. Internal organs such as heart and kidneys may also be eaten; the liver in particular is often used as a substitute for goose liver in foie gras.
<b>Partridge</b>	These small, plump birds are related to pheasants, and very tasty. Varieties include the chukar, red-legged partridge or French partridge, and grey partridge or English partridge.
<b>Pigeon</b>	Pigeon meat is dark and very tender. Varieties include the squab, which is a young pigeon that's never flown, the wood pigeon, rock dove, and ring dove.
<b>Venison</b>	The term venison applies to deer meat, elk meat, moose meat, caribou meat, and reindeer meat, all of which can be used interchangeably. Venison is very lean, so it's important not to overcook it. The best cuts are from the back strap, or loin area.
<b>Alligator</b>	Alligator meat is lean and mild and people say it tastes like a combination of pork, chicken, and rabbit. The best meat comes from the tail.
<b>Antelope</b>	Antelope are related to goats, but the meat resembles strongly-flavored venison.
<b>Bear</b>	Compared with beef, bear is high in protein and low in fat and calories. Make sure you cook it thoroughly--it's possible to contract trichinosis from undercooked bear meat.
<b>Bison</b>	Buffalo (Bison) meat tastes like beef, but it's a lot leaner. Tougher cuts are cooked very slowly over low heat. Meat is pale coloured and slightly sweetish.
<b>Rabbit</b>	Rabbit is low in fat and similar in taste and texture to chicken.
<b>Boar</b>	Boar (also known as wild boar) meat is similar to pork, only leaner, redder, and stronger-tasting. It should be cooked thoroughly, it's possible to contract trichinosis from undercooked boar meat.
<b>Grouse</b>	This is possibly the most choice of all game birds, with flavorful, dark meat. Varieties include the ptarmigan, capercaillie, and blackcock.
<b>Kangaroo</b>	Kangaroo meat is becoming increasingly popular in Australia. It has a very strong, gamey flavor that's a bit like venison. It's very lean, so overcooking should be avoided.
<b>Turtle</b>	(also called cooter) Turtle meat is very flavorful though it's somewhat chewy. It often goes into soups.

### 17.7.2 Processing of Game

Once obtained, game meat must be processed. The method of processing varies by game species and size. Small game and fowl may simply be carried home to be butchered. Large game such as

deer is quickly field-dressed by removing the viscera in the field, while very large animals like moose may be partially butchered in the field because of the difficulty of removing them intact from their habitat.

Some believe the meat tastes better and is more tender if it is hung and aged for a few days before processing; however, this adds to the risk of contamination. Small game can be processed essentially intact; after gutting and skinning or defeathering (by species), small animals are ready for cooking although they may be disjointed first. Large game must be processed by techniques commonly practiced by commercial butchers.

### 17.7.3 Cooking of Game

Generally game is cooked in the same ways as farmed meat. Because some game meat is leaner than traditional store-bought beef, overcooking is a common mishap which can be avoided if properly prepared. It is sometimes grilled or cooked longer or by slow cooking or moist-heat methods to make it more tender, since some game tends to be tougher than farm-raised meat. Other methods of tenderizing include marinating as in the dish Hasenpfeffer. Proteolytic enzymes present in unripe fruit may also be used as meat tenderizers. Commercially available and popular tenderizers and papain (from paya latex) and bromelin from pineapple. Traditionally, game meat used to be hung until "high", i.e. approaching a state of decomposition. The term 'gamey', 'gamy' refers to this usually desirable taste (*haut goût*).

## 17.8 POULTRY

Poultry is the catch-all term for domesticated birds that are meaty enough to eat. Poultry tends to be lower in saturated fat than other meats, so it's a good choice for health or weight. The fat can be still more lowered by removing the skin and by using light meat from the breast instead of the darker meat from the thighs and legs. Younger birds are more tender than older ones, so they're best for grilling, roasting, and frying. Older, tougher birds do better if they're cooked in stews or soups.

Poultry includes the different varieties and sizes of chicken, turkey ducks; geese and guinea fowls.

**Chicken** Chicken is the meat derived from the chicken. It is the most common type of poultry in the world, and is frequently prepared as food in a large number of ways.

**Duck** This fatty bird makes a divine roast, but it's hard to cook without setting off the smoke alarm. It helps to pour off the fat while it's roasting. Wild ducks are less fatty than store-bought ducks. A young duck, called a duckling, broiler duckling, roaster duckling, is more tender than an old duck or mature duck. High fat meats like duck generally should be cooked at a



higher temperature and for a longer time than low-fat meats.

**Goose** The meat is dark and fatty, and more like beef than chicken. Young goslings are the priciest, and the most tender. Wild goose is tougher and has a much stronger flavor than a domesticated goose. High-fat meats like goose should be cooked at a higher temperature and for a longer time than low-fat meats. Frozen goose is a good substitute for fresh.

**Guinea fowl** This small bird is very lean and tastes like a pheasant. It's very lean, so bard it before roasting, or marinate it before putting it on the grill.

**Poussin** A poussin is a very young chicken, and it has a very delicate flavor and very little fat. They're available in some gourmet markets.

### 17.8.1 Cuts of Poultry

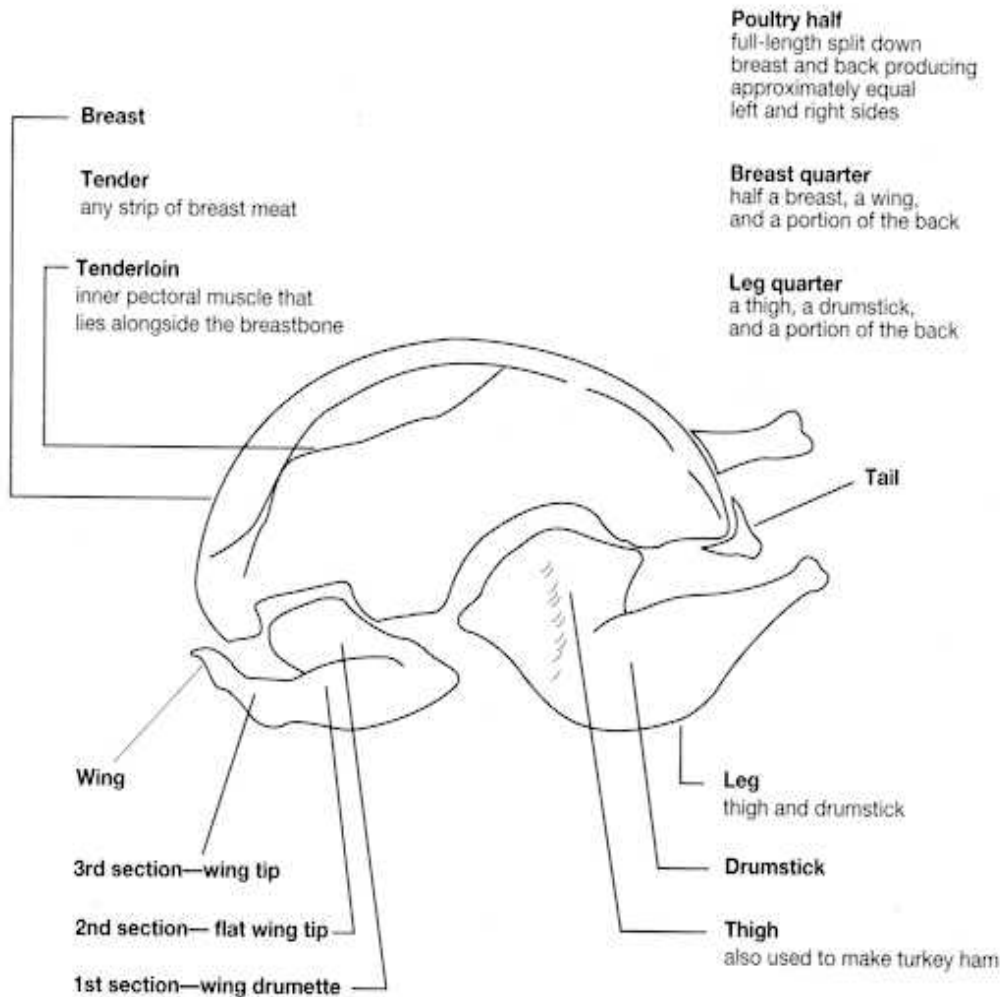

















Figure 17.6 Cuts of Poultry



	<p><b>Whole Poultry</b></p> <p>The chicken with all parts intact, generally including the giblets stuffed in the cavity. Consists of white and dark meat.</p>
	<p><b>Poultry Half</b></p> <p>The chicken is split in half lengthwise through the breast and back, leaving fairly equal halves consisting of the same parts. Both halves consist of white and dark meat.</p>
	<p><b>Breast</b></p> <p>The entire breast portion of the chicken. It is available bone-in, boneless, skin-on and skinless. Consists of white meat only.</p>
	<p><b>Breast Quarter</b></p> <p>Generally includes a little more than one quarter of the meat on the chicken. The cut includes half a breast, a wing, and part of the back.</p>
	<p><b>Breast Halves</b></p> <p>Also referred to as split breast. The breast portion of the chicken that has been split lengthwise, producing two halves. They are available bone-in, boneless, skin-on and skinless. Larger breast halves are sometimes cut in half to provide smaller portion sizes. Consists of white meat only.</p>
	<p><b>Tenderloin</b></p> <p>The muscle of the breast, which runs along both sides of the breastbone, located on the upper portion of the breast. Consists of white meat only.</p>
	<p><b>Wing</b></p> <p>The wing of the chicken consists of three sections, the wing tip, the wingette (or flat wing tip), and the drummettes.</p>

	<p><b>Drummette</b></p> <p>The section of the wing that is connected to the body of the bird and contains most of the wings meat. It resembles a very small drumstick.</p>
	<p><b>Wingette</b></p> <p>Also referred to as the flat wing tip. The middle section of the wing, which does not contain much meat, but is generally moister than the drummette.</p>
	<p><b>Wing Tip</b></p> <p>The third and outer most section of the wing. Does not contain much meat and is many times discarded. It can be used when making stock to help add flavor to the broth.</p>
	<p><b>Leg Quarters</b></p> <p>Generally includes a little less than a quarter of the meat on the chicken. The cut includes a thigh, drumstick, and a part of the back.</p>
	<p><b>Leg</b></p> <p>The leg of the chicken consists of two parts, which are the thigh and the drumstick. Consist of dark meat only.</p>
	<p><b>Thigh</b></p> <p>The top portion of the leg above the knee joint that is connected to the body of the chicken. Consists of all dark meat.</p>
	<p><b>Drumstick</b></p> <p>The bottom portion of the leg below the knee joint. Consists of all dark meat.</p>
	<p><b>Giblets</b></p> <p>Consists of the neck, liver, heart, and gizzard (comparable to offal in beef).</p>

**17.9 CHICKEN**

Chicken is a relatively lean and inexpensive meat, so it's a culinary workhorse. Broilers are between 2 1/2 and 5 pounds, and can be broiled, roasted, or fried. They're not good for stewing. Stewing chickens are tougher and best used, as their name suggests, in stews and soups. For soups, generally young chicks are used rather than fully matured birds. Capons are castrated male chickens that are large (between 5 and 10 pounds) and tender, and have relatively more white meat. They're great for roasting. Free-range chickens are tastier and more humanely raised, but tougher and more expensive.

**17.9.1 Classification of Chicken**

Chickens are first classified by age and weight. Young chickens are tender and cook quickly; older chickens need slow cooking to make them tender. For best results, it's important to know which type of chicken to buy for cooking.

**Broiler-fryers** are young chickens weighing from 1 1/2 to 3 1/2 pounds. Only 7 to 10 weeks old, they yield tender, mildly flavored meat and are best when broiled, fried, or roasted.

**Roasters** are 4- to 6-pound chickens that are 16 weeks old. As the name implies, they are perfect for roasting and rotisserie cooking.

**Capons** are young, castrated roosters that weigh from 5 to 7 pounds. These richly flavored birds have a higher fat content and yield more meat than roasters.

**Stewing Hens** are adult chickens from 1 to 1 1/2 years old. They weigh from 4 1/2 to 7 pounds and have tough, stringy meat and require prolonged cooking for more than an hour or two to make the meat edible. Stewing hens are excellent for stocks, soups, or stews, since moist-heat preparation tenderizes them and enhances their flavor.

**Whole Chickens** of every type are available with the neck and giblets wrapped separately and stuffed inside. Look for livers and giblets packaged separately in the shops for use in stuffings, soups, and specialty dishes.

**Cut-up chickens** usually broiler-fryers, are disjointed whole chickens consisting of two breast halves, two thighs, two wings, and two drumsticks. Small broiler-fryers are also available in halves and quarters.


**17.9.2 Selection of Chicken**



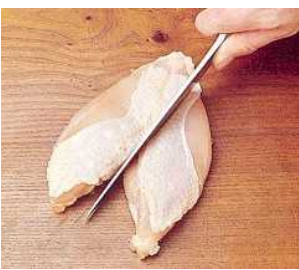

- 1) Soft fluffy feathers should be all over the body, especially concentrated under the wings.
- 2) The feathers should be easy to pull out.

- 3) The skin should be clear and smooth with no bluish tinge spots.
- 4) The feet should be supple with smooth overlapping scales, and if fresh, moist.
- 5) Combs and wattle (the skin hanging near the beak) small and well developed. The comb should be bright red.
- 6) Conformation or the shape of the bird is important, and the bird should be free from deformity.
- 7) The eyes should be prominent and clear.
- 8) It should not have a marked unpleasant smell.

### 17.9.3 Cutting of Chicken

Whole chickens tend to intimidate beginning chefs. Whole chickens do have a lot of pieces, but they are relatively easy to work with. They're cheaper to buy and give freedom to create the meal of interest. There are a few different techniques for cutting a whole chicken. This is a basic method for cutting up and disjoints a whole chicken with the least amount of waste.

<p><b>1. Remove the legs</b></p> <p>Place the chicken breast side up on a solid cutting board. Pull one leg away from the body and cut through the skin between the body and both sides of the thigh. Bend the whole leg firmly away from the body until the ball of the thighbone pops from the hip socket. Cut between the ball and the socket to separate the leg. Repeat with the other leg.</p>	
<p><b>2. Divide the legs</b></p> <p>Place the chicken leg skin side down on the cutting board. Cut down firmly through the joint between the drumstick and the thigh.</p>	
<p><b>3. Remove the wings</b></p> <p>With chicken on it's back, remove wing by cutting inside of wing just over joint. Pull wing away from body and cut from down through the skin and the joint. Repeat with the other wing.</p>	

<p><b>4. Cut Carcass in half</b></p> <p>Cut through the cavity of the bird from the tail end and slice through the thin area around the shoulder joint. Cut parallel to the backbone and slice the bones of the rib cage. Repeat on the opposite side of the backbone.</p>	
<p><b>5. Remove the breast</b></p> <p>Pull apart the breast and the back. Cut down through the shoulder bones to detach the breast from the back. Cut the back into two pieces by cutting across the backbone where the ribs end.</p>	
<p><b>6. Cut Breast in half</b></p> <p>You may leave the breast whole if your recipe requires. To cut it in half, use a strong, steady pressure and cut downward along the length of the breastbone to separate the breast into two pieces.</p>	
<p><b>Whole Chicken Cut in 10 Pieces</b></p>	
	<p>A. Legs, B. Thighs C. Wings D. Part of back portion. E. Tail end of back portion. F. Breasts</p>

**17.9.4 Cooking of Chicken**

Chicken is incredibly versatile and can be cooked in many different ways. Each method of cooking helps bring out the individuality of the pieces and flavors of chicken.

**Baking** Baking is an oven-based technique that is considered to be among the healthiest methods for cooking chicken.

**Poaching** Poaching is a technique that cooks chicken slowly and gently in a simmering, but not boiling, liquid that



	covers the food. The poaching liquid may be flavored or seasoned.
<b>Browning</b>	Browning chicken is the first step in many recipes for cooking chicken.
<b>Braising</b>	Braising is a moist-heat cooking method used to tenderize tough cuts of meat. Chicken is normally browned first and then braised.
<b>Stir-Fry</b>	Stir-frying quickly cooks bite-size pieces of chicken over very high heat in a small amount of oil.
<b>Roasting</b>	Roasting is a technique often performed in the broiler.

### 17.9.5 Chicken Nutritional Facts

Chicken is high in protein, low in fat and low in cholesterol, making it a good selection for a healthy diet. Our bodies require a certain amount of protein daily and the body does not store protein so we need to replenish it each day. A 3-ounce portion of chicken provides a large amount of our daily requirement for protein. Our bodies also require fat in our diet, which allows us to absorb vitamins that are fat-soluble and energy producing. But, too much fat is not healthy. Chicken is lower in fat than most other meats and over half of the fat is unsaturated fat, the type that helps lower cholesterol. The white meat is lower in fat than the dark meat of the chicken but the dark meat is higher in iron, an important nutrient for a healthy body.

### 17.9.6 Safe Storage of Chicken

- Fresh, raw chicken can be stored in its original wrap for up to two days in the coldest part of the refrigerator. However, freeze chicken immediately if you do not plan to use it within two days after purchasing. You can freeze most chicken in its original packaging safely for up to two months; if you plan to freeze it longer, consider double-wrapping or rewrapping with freezer paper, aluminum foil, or plastic wrap.
- Stocking the freezer with boneless, skinless chicken breasts and thighs can be a real timesaver. Divide the chicken into efficient, meal-size portions and package for freezing. These convenient packages defrost and cook quickly and eliminate leftovers.
- Airtight packaging is the key to freezing chicken successfully. When freezing whole chickens, remove and rinse giblets (if any) and pat dry with paper towels. Trim away any excess fat from the chicken. Tightly wrap, label, date, and freeze both chicken and giblets in separate freezer-strength plastic, paper, or foil wraps.
- Thaw frozen chicken, wrapped, in the refrigerator for best results. Thawing times for frozen chicken can vary depending on how thoroughly frozen the chicken is and whether the chicken is whole or cut up.

### CHECK YOUR PROGRESS

1. Name a few popular cuts of beef steak.
2. Fill in the blanks
  - (i) Ox ..... soup is an excellent quality soup.
  - (ii) Game varieties can be grouped into ..... and .....
  - (iii) Meats of game animals are usually ..... (low fat).
  - (iv) Depending on the age, slaughtered lamb is called as ....., ....., ....., ..... and .....
3. What are the main constituents of meat?

### 17.10 LET US SUM UP

Meat is generally considered to be the flesh of any animal and includes beef, veal, lamb, and pork along with poultry, fish, and shellfish. Meats in general are high in cholesterol than fish. In the descending order of cholesterol content, pork or products of pork in all forms are highest followed by beef, sheep / lamb and chicken.

The terms lamb, hogget or mutton are names for the animals or meat of a domestic sheep. The meat of a sheep a year old or younger is generally known as lamb, whereas the meat of an older sheep is either hogget or mutton.

Beef is the meat from bovines, especially domestic cattle. Veal comes from young calves, and so the meat is tender and lean and the flavor is delicate. A steak is a slice from a larger piece of meat typically from beef. Most steaks are cut perpendicular to the muscle fibres, improving the perceived tenderness of the meat.

Pork is the meat from the domestic pig (*Sus scrofa*). Pork is eaten in various forms, including cooked (as roast pork), cured or smoked (ham, including the Italian Prosciutto) or a combination of these methods (gammon, bacon or Pancetta).

Game is any animal hunted for food or not normally domesticated (such as venison).

Poultry is the catch-all term for domesticated birds that are meaty enough to eat. Poultry includes the different varieties and sizes of chicken, turkey ducks; geese and guinea fowls.

Chicken is a relatively lean and inexpensive meat, so it's a culinary workhorse. Chickens are first classified by age and weight. Young chickens are tender and cook quickly; older chickens need slow cooking to make them tender.



### 17.11 LESSON END ACTIVITY

1. Familiarise yourself with various cuts of meat from pork, beef, sheep / goat, chicken and fish.
2. Cook various cuts of meat available in your kitchen and record their characteristics.

### 17.12 KEY WORDS

<b>Butchering</b>	To slaughter or prepare (animals) for market.
<b>Engorged</b>	To fill to excess, as with blood or other fluid.
<b>Brisket</b>	The ribs and meat taken from the chest of an animal.
<b>Subcutaneous</b>	Located or placed just beneath the skin.
<b>Trichinosis</b>	Disease that can arise from eating under-cooked pork or pork sausage meat; due to <i>Trichinella spiralis</i> , a worm that is a parasite in pork muscle.
<b>Domesticated</b>	The adaptation of an animal or plant through breeding in captivity to a life intimately associated with and advantageous to humans.

### 17.13 QUESTIONS FOR DISCUSSION

1. Indicate the hierarchy of cholesterol content in various meats.
2. What is the function of meat tenderizer? Give example.
3. Explain the different cuts of beef in detail.
4. Write a note on steaks.
5. Differentiate Bacon and Ham.
6. What are the different methods of cooking chicken?

### CHECK YOUR PROGRESS - ANSWER

1. Chateaubriand steak, chuck steak, cube steak, filet mignon, flank steak, flat iron steak and hanger steak.
2. (i) tail  
(ii) birds, animals  
(iii) lean  
(iv) baby lamb (5 – 6 weeks old), spring lamb (3 – 5 months old), regular lamb (less than 12 months old), yearling (12 – 24 months), mutton (above 24 months)
3. High is protein and amino acids, vitamins, minerals and fat, low in carbohydrates and no fibre.

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# UNIT V





## LESSON 18

### SANDWICHES

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#### 18.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Sandwiches and their types
- Types of Breads used in making sandwiches
- Types of Fillings used in making sandwiches
- Preparation of sandwiches

#### 18.1 INTRODUCTION

Sandwiches are popular in today's culture. They are easy to make and eat practically anywhere and can be as fancy or as simple as we like. A sandwich is the most innovative and versatile food, which are acceptable on every occasion. Open or closed, single or decked, flat or rolled, sweet or savoury, hot or cold there are

sandwiches with fillings and toppings which will take a life time to describe.

The first recorded sandwich was made by the famous Rabbi, Hillel the Elder, who lived during the 1st century B.C. A poor man, but a great scholar, he began the Passover custom of sandwiching a mixture of chopped nuts, apples, spices, and wine between two matzohs to eat with bitter herbs. This sandwich is the foundation of the Seder and is named after him. But matzoh, being unleavened bread, is not absorptive of sauces and juices as today's sandwich has become.

John Motagu, 4<sup>th</sup> Earl of Sandwich, invented the “meal between the slices” that has retained his name. The Earl lived in England in the 18<sup>th</sup> Century. Human beings, being adventurous, have developed the sandwich into both a quick and easy meal, and an art form.

Po-boy, muffuletta, clubhouse, Reuben, grilled, meat, tuna or egg salad – these are just some of the many different types of sandwiches frequently eaten for lunches or light dinners.

## 18.2 SANDWICHES

A sandwich is a food item typically made of two or more slices of leavened bread with one or more layers of meat, seafood, vegetables, cheese or jam or butter. The bread can be used as is, or it can be coated with butter, oil, or other optional or traditional condiments and sauces to enhance flavor and texture.

The slices of bread are stacked neatly, resting on a crust of bread. They are then buttered (unless this has been done before each slice is cut) and the prepared fillings are added, so the complete loaf is made into long sandwiches. If they are to be kept for any length of time the crusts are replaced and the loaf wrapped in clean cloth, greaseproof paper or foil. When required for service the sandwiches are easily and quickly cut into any required size or shape, neatly dressed on a doily on a flat dish and sprinkled with washed and drained mustard cress.

A typical set of fillings for a loaf could be: ham, tongue, smoked salmon, tomato, cucumber, egg., etc.

Sandwiches are commonly carried to work or school in lunchboxes or brown paper bags (in sandwich bags) to be eaten as the midday meal on picnics, hiking trips, or other outings. In some parts of the world, they are also served in restaurants as entrées, and are sometimes eaten at home, either as a quick meal or as part of a larger meal. When eaten as part of a full meal, sandwiches are traditionally accompanied with such side dishes as a serving of soup (soup-and-sandwich), a salad (salad-and-sandwich), french fries/ chips, potato chips/ crisps and a pickle or coleslaw.



## 18.3 TYPES OF SANDWICHES

Sandwiches may be made from every kind of bread, fresh or toasted, in a variety of shapes and sizes and with an almost endless assortment of fillings. Few example of general types of popular sandwiches are explained in this section. Combinations of sandwiches and fillings are endless and the limitation in number is merely a matter of limitation in individual's imagination.

### 18.3.1 Double Decker

These types of sandwiches use three slices of bread. The filling is placed on the top of the first slice. The next slice is buttered and placed on top, lettuce, tomato and cucumber or fillings of choice are placed on top of this slice. The final slice is placed in position. Pressed, trimmed and held together with a plastic cocktail stick with stuffed olive or cherry.

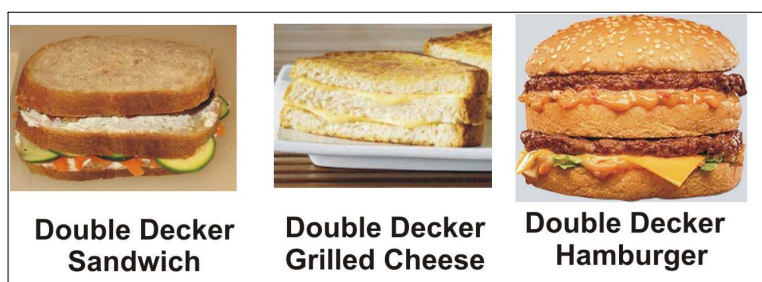


Figure 18.1 Double Decker Sandwiches

### 18.3.2 Sandwich Cake

These types of sandwiches are made from round bread loaves and look like iced layer cakes. They are sliced into two or three round slices with different savoury spread in each layer and iced on top with soft icing containing butter, cheese, etc. It is cut into wedges like cakes. Finished product may look like a cylinder.



Figure 18.2 Sandwich Cake

Sometimes, the regular ice cream of choice flavour may also be used as a spread and stored in the fridge before serving. It may

be stored after cutting into slices or stored as a whole and cut into slices prior to serving.

### 18.3.3 Loaf Sandwich

These types of sandwiches are made from bread loafs. The loaf of bread is taken and sliced lengthwise, filled with filling of choice and iced. It is sliced across the bread and served.



Figure 18.3 Loaf Sandwiches

### 18.3.4 Pinwheel Sandwich

Pinwheel sandwiches are generally prepared using the top crust of the loaf. The top crust is taken out of the sandwich loaf. It is then sliced lengthwise, and butter and soft filling are spread evenly.

18.4



Figure

Pinwheel Sandwiches

Each slice is rolled and wrapped firmly in a foil and chilled till it is set. It is cut into thin slices and served. Pinwheel sandwiches may be served with other sandwiches or as cold canapés.

### 18.3.5 Bookmaker Sandwich

Bookmaker Sandwich has underdone (rare) minute steak between two slices of hot buttered toast.



Figure 18.5 Bread Maker

### 18.3.6 Ribbon Sandwich

Ribbon sandwiches are prepared using two coloured breads. Whole wheat loaf and white bread loaves are sliced lengthwise in  $\frac{1}{4}$  inch strips. Whole wheat bread slice is tinted with chive cheese. White bread slice is spreaded with deviled ham or minced tuna fish salad mix.



Figure 18.6 Ribbon Sandwiches

A five layered loaf is prepared by alternatively placing whole wheat bread slice and white bread slice on top of one another. They are then wrapped into waxed paper and chilled. They are then sliced into  $\frac{1}{2}$  inch bite sized strips.

### 18.3.7 Club Sandwich

A club sandwich, also called a clubhouse sandwich, is a type of sandwich sometimes served as a double-decker. The double-decker version is usually cut into quarters, and often held together by toothpicks. The traditional club ingredients are turkey, bacon, lettuce, and tomato.



Figure 18.7 Club Sandwiches

The sandwich is usually served on toasted bread, but untoasted bread can be used. Ham is sometimes substituted for bacon, and chicken sometimes for turkey.

### 18.3.8 Open Sandwich or Scandinavian Smorrebrod

This is prepared from a buttered slice of any bread garnished with any type of meat, fish, eggs, vegetables, salads, etc. The varieties of open sandwiches can include some of the following spreads / fillings: smoked salmon, lettuce, potted shrimps, slice of

lemon; scrambled egg, asparagus tips, chopped tomato; grilled bacon, cold fried egg, tomato sauce, mushrooms; cold sliced beef, sliced tomato, fans of gherkins (type of cucumber).



Figure 18.8 Open Sandwich / Scandinavian Smorrebrod

#### 18.4 TYPES OF BREADS USED IN SANDWICH MAKING

It may seem obvious, but the bread used when making sandwiches is the first thing that is noticed. It is of utmost importance that the bread is fresh and appetising to the eye. There are many different types of breads used in sandwich making now, but some people still prefer their sandwich the 'old fashioned way' with two slices of white or brown sandwich bread. Others enjoy more exotic types of bread. These can include:

- Basic sandwich loaf in white or brown – this can come pre-sliced or as a whole loaf.
- Wraps – these come in a variety of flavours, such as plain, tomato, etc. They are less filling than normal bread.
- Bagels – a popular choice of a round bun with a hole in the centre.
- Baguette / Roll – these can be long or round, in a variety of flavours.
- Pitta Breads – flat and oval in shape. It is better to lightly toast these prior to slicing.
- Tomato breads, olive breads, etc. There are many varieties of other types of breads which can be cooked in house or bought in.

#### 18.5 TYPE OF SPREADS, FILLINGS AND SEASONINGS USED IN SANDWICH MAKING

##### Types of Spread:

There are three commonly used spreads used in sandwich making. They are peanut butter, margarine butter and plain or salted.

##### Fillings to Flavour Sandwiches:

Butter / mayonnaise, Different types of meat –shredded chicken, sliced beef, etc., Eggs in a variety of styles (hot and cold) – egg mayonnaise, sliced egg, etc., Different

types of fish – tuna, salmon, etc., Cheeses, Pulses & seeds, Dressings and sauces

Sandwiches

**Seasonings to Flavour Sandwiches:**

Mayonnaise (egg, salmon, etc), Vinaigrette (crab, lobster, fish, egg), English mustard (ham, beef), French mustard(cheese, tongue), Chutney(cheese, tinned meat), Pickles.

**Examples of Combination Fillings:**

Fish and lettuce; Cheese and tomato; Cucumber and egg; Apple and chutney; Roast beef and coleslaw; Roast pork and apple sauce; Tuna fish and cucumber; Chopped ham, celery and apple.

**18.6 PREPARATION OF SANDWICHES**

**18.6.1 Preparation of Vegetarian Cheese steak Sandwich**

<b>Vegetarian Cheese Steak-Sandwich</b>	
Portabello mushrooms, thinly sliced	2
Onion, thinly sliced	1 medium
Green bell pepper, thinly sliced	1 medium
Olive oil	2 tbsp
Salt and freshly ground pepper to taste	
Garlic powder	¼ tbsp
Cheddar cheese	4 slices
Steak rolls, split and toasted	2
<p>1) Saute the mushrooms, onions, and peppers until tender and onions are slightly golden over medium heat. Stir in seasonings and cook for 1 to 2 minutes longer.</p> <p>2) Mound mixture onto bottom half of each bread roll. Top each with 2 slices of cheese and place under broiler for a minute or two to melt.</p> <p>3) Place the top bread roll halves on and serve sandwiches immediately.</p>	

**18.6.2 Preparation of Pinwheel Sandwich**

<b>Pinwheel Sandwich</b>	
Bread (whole wheat or white)	12 slices
Mayonnaise	½ cup
Finely shredded cabbage	¼ cup
Finely chopped spring onion, green stem only	1 tbsp
Salt	

White pepper powder	½ tsp
<ol style="list-style-type: none"><li>1) Combine all ingredients except bread slices.</li><li>2) Trim crusts of all slices. Press each slice lightly with a rolling pin on a work surface.</li><li>3) Smear water on the edge of each slice place edge of another slice on it and roll again.</li><li>4) Spread the mayonnaise mixture on the rolled out long slice. Gently roll from the edge as tightly as possible.</li><li>5) Continue the process with other slices and wrap them individually in plastic wrap or aluminium foil.</li><li>6) Place the rolls in the fridge for an hour. Take out, unwrap serve slice.</li></ol>	

### CHECK YOUR PROGRESS

1. Fill in the blanks
  - i) ..... sandwiches are made from round bread loaves and look like iced layer cakes.
  - ii) A club sandwich is also called as ..... sandwich.
  - iii) ....., ..... and ..... are the three commonly used spreads used in sandwich making.
2. Define sandwich.
3. List any five types of sandwiches.

### 18.7 LET US SUM UP

A sandwich is a food item typically made of two or more slices of leavened bread with one or more layers of meat, seafood, vegetables, cheese or jam or butter. The bread can be used as is, or it can be coated with butter, oil, or other optional or traditional condiments and sauces to enhance flavor and texture.

Sandwiches are commonly carried to work or school in lunchboxes or brown paper bags (in sandwich bags) to be eaten as the midday meal on picnics, hiking trips, or other outings. In some parts of the world, they are also served in restaurants as entrées, and are sometimes eaten at home, either as a quick meal or as part of a larger meal. When eaten as part of a full meal, sandwiches are traditionally accompanied with such side dishes as a serving of soup (soup-and-sandwich), a salad (salad-and-sandwich), french fries/ chips, potato chips/ crisps and a pickle or coleslaw.



Sandwiches may be made from every kind of bread, fresh or toasted, in a variety of shapes and with an almost endless assortment of fillings.

### 18.8 LESSON END ACTIVITY

1. Prepare a few sandwiches mentioned in this lesson and record your observation on the differences between them.
2. Find out the names of the sandwiches which are very popular in India.

### 18.9 KEY WORDS

<b>Seder</b>	is a Jewish ritual feast held on the first night of the Jewish holiday of Passover.
<b>Entrée</b>	A dish served in formal dining immediately before the main course or between two principal courses.
<b>Asparagus</b>	A long green vegetable with small scale like leaves. It is really a very thick, fleshy and succulent pencil like stem which originates in the underground rhizomes and emerges out of soil. It may be green and called so.
<b>Gherkins</b>	Young green cucumber of a small variety ( <i>Cucumis anguira</i> ), used mainly for pickling.
<b>Coleslaw</b>	A salad of finely shredded raw cabbage and sometimes shredded carrots, dressed with mayonnaise or a vinaigrette.

### 18.10 QUESTIONS FOR DISCUSSION

1. Name a few different sandwiches which are popular.
2. What are the traditional ingredients in club sandwich?
3. What are the criteria for good quality sandwich?
4. Give a few examples of combination fillings.

### CHECK YOUR PROGRESS - ANSWER

1. i) Sandwich Cake  
ii) clubhouse  
iii) peanut butter; margarine butter; plain or salted
2. A sandwich is a food item typically made of two or more slices of leavened bread with one or more layers of meat, seafood, vegetables, cheese or jam or butter.
3. i) Double decker sandwich  
ii) Sandwich cake  
iii) Loaf sandwich  
iv) Pinwheel sandwich



Food Production  
and Patisserie - I

v) Ribbon sandwich

### **18.11 REFERENCES**

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## LESSON 19

### PREPARATION OF POTATOES

#### CONTENTS

19.0	Aims and Objectives
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19.2	Selection of Potatoes
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#### 19.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate the appropriate skills, and show an understanding of the following:

- Selection and Pre-treatment of potatoes
- Methods of cooking potatoes
- Preparation of potato dishes

#### 19.1 INTRODUCTION

"Potatoes served at breakfast, At dinner served again;  
Potatoes served at supper, Forever and Amen!"

- Pennsylvania prayer

Potato enjoys universal appeal either as a mainfood or as a side dish or as a versatile snack food. It is considered as a staple food by millions around the globe, the other two being rice and

wheat. There is hardly any kitchen in the world where potato is not used in one form or another.

Potato is used in a variety of ways that include baked potatoes, masked potatoes, finger chips, French fries and the simple deep fried crispy chips. Although it is major food in many countries, it is only used as a popular vegetable in India in curries or stir fries. However, with regard to its use as chips, India is no less than any country in the world.

Potatoes contain many of the essential nutrients that the nutritionists recommend as essential in the human diet. It contains starch, sugar, cellulose, crude fibre, pectic substances, Protein, amino acids, organic acids, lipids, vitamin c, enzymes, minerals (P, Ca, Mg, K, Fe, S, Cl) etc. considered essential for human health. Potatoes eaten with the skin provide nearly half of the Daily Value for vitamin C and are one of the richest sources of potassium and fiber. It is worth while to remember that vitamin C is highly heat sensitive or thermolabile (heat destroyed). One medium-sized potato has 110 calories and provides complex carbohydrates needed to fuel our brains and bodies, supplying us the energy we need for a busy lifestyle and to stay healthy and happy.

## 19.2 SELECTION OF POTATOES

For practical purposes, potatoes can be put into three groups, although the distinctions between them are not clear-cut, and show considerable overlapping. While the Russet Burbank baking potato is probably the most suitable for general use. Potatoes with oddly-colored flesh often provide antioxidants like beta-carotene (vitamin A) and lycopene.

**New potato** is most frequently used to describe those potatoes freshly harvested and marketed during the late winter or early spring. The name is also widely used to designate freshly dug potatoes which are not fully mature. The best uses for new potatoes are boiling or mashing.

**General Purpose Potato** includes the great majority of supplies, both round and long types. With the aid of air-cool storage, these are available amply throughout the year. As the term implies, they are used for boiling, frying, and baking, although many of the common varieties are not considered to be best for baking. General purpose potatoes are rich in starch.

**Baking Potato** these are grown specifically for baking quality. They have high starch content. Both variety and farm location are important factors affecting baking quality. A longish variety with fine, scaly netting on the skin, such as the Russet Burbank from Idaho, is commonly used for baking.

In selecting new potatoes, look for firm potatoes that are free from blemishes and sunburn (a green discoloration under the skin), which are of undesirable quality. For general-purpose and baking potatoes, look for reasonably smooth, firm potatoes free from blemishes, sunburn, and decay. Avoid potatoes with large cuts, green spots, bruises, decay, sprouting, or shriveling. Injuries to tubers tend to increase the level of solanine, an alkaloid which is a deadly poison.

### **Potato Sprouts are Toxic (Poisonous):**

A sprout of any size can be toxic. The same is true for potatoes that turn a greenish hue due to exposure to sunlight while growing in the farm. A potato in this condition is "light-struck" which causes a build-up of Solanine. The green part, if eaten in large quantity, can cause illness. If there is slight greening, cut away the green portions of the potato skin before cooking and eating.

## **19.3 PRE-TREATMENT OF POTATOES**

Potatoes are easier to prepare and healthier when cooked with their skins on. Potatoes with thin skin are always rinsed and scrubbed thoroughly before using. The potatoes with thick skin should be peeled. After the potatoes are peeled they should be kept in water to avoid discolouring due to direct exposure to atmosphere.

When potatoes are cut the pieces are soaked in the cold water to preserve the color. Limit the water soaking time to two hours to retain the water-soluble vitamins and nimerals like potassium. Skin discoloration (pinkish or brownish) happens from the carboyhdrates in the potato reacting with oxygen in the air. Potatoes that do become discolored in this way are safe to eat and do not need to be thrown away. Usually this discoloration will disappear with cooking. Points to be noted while using potatoes:

- **STORE** potatoes in a cool, dark place that is well ventilated. Ideal storage temperature is 45 to 50°F.
- **DO NOT** refrigerate fresh potatoes. Potatoes stored below 40°F will be darker when cooked and have a sweeter flavor due to the conversion of starch into sugar.
- **AVOID** prolonged exposure to light, which can turn the potatoes green.
- **REMOVE** any green areas or sprouts prior to preparing for cooking.
- **KEEP** the skin on for additional nutrients.
- **CUT** potatoes into desired shape. Cubes are most common.
- **PUT** in pot and cover with cold water. Make sure all potatoes are completely submerged.

- **HEAT** until boiling. Reduce heat and **SIMMER** 20-30 minutes or until potatoes are tender when pierced with fork.
- **DRAIN** potatoes thoroughly. If retaining the shape of the potato pieces is important, drain small groups at a time to avoid crushing.
- **USE** boiled potato pieces within 2 hours; refrigerate unused portion.

## 19.4 METHODS OF COOKING POTATOES

### 19.4.1 Boiling

Old potatoes normally need to be peeled before boiling. Many new potatoes are better when boiled in their skins, but should of course be washed first. Small potatoes can be cooked whole. Larger potatoes will cook more evenly and quickly if cut into roughly egg-sized pieces. Put the potatoes in a large enough pan and add enough water to submerge fully. Add a little salt if you like. Bring to a boil. Potatoes will take around 20 minutes to cook through. To test whether they are done, press the tip of a cook's knife into one. It should be able to slip in and out easily. Serve with butter and salt or with a sprinkling of chopped chives. Also boiled potatoes go well with *mayonnaise*.

### 19.4.2 Mashing

Boil a suitable variety as above, but keep cooking for longer than needed. Drain the cooking water and cut into small pieces. Add some milk and butter (to taste) and *purée* all ingredients. Use a potato-ricer for best results or a hand-held masher for possibly lumpy mash. Food processors can have a tendency to overprocess for mashed potatoes, instead producing more of a *purée* suitable for vichyssoise and other potato soups. Salt and pepper or other herbs and spices can also be added. Roasted garlic is also a popular addition.

### 19.4.3 Roasting

Roast potatoes are a good and traditional accompaniment to roast meat. Prepare the potatoes as for boiling, and parboil them for just a few minutes. Then put in the roasting dish around the meat, and baste them with the juices as cooking goes on.

### 19.4.4 Baking

Use a large potato, with its skin on. Preheat the oven to very hot (gas mark 7) and put in the potatoes for about an hour. Especially, when using an electric oven, it is important to protect the potatoes from drying by covering them with foil or coating them in oil, on cover them with a lid. Put a metal skewer through the potato to help distribute heat evenly. Baking time depends on the size of the potato which can be decided by trial and error. Serve the potato as

hot as necessary. Fillings can include butter, grated cheese (something strong like cheddar or red Leicester), baked beans, pesto, etc. and eat the skin.

#### **19.4.5 Microwave**

Perforate the skin with a fork in many places to prevent the potato from exploding. It is important to protect the potatoes from drying by covering them with a damp paper towel or coating them in oil. A low power setting may be enough. Trial and error is often necessary. Serve the potato as hot as necessary. Fillings can include butter, grated cheese (something strong like cheddar or red Leicester, though milder ones like Mozzarella are also good), baked beans, pesto - you name it and eat the skin.

#### **19.4.6 Deep Frying**

Deep fried a potato is the finger chip or french fry. The basic method for preparing chips is as follows. Chop the potatoes into chips and leave them in some cold, preferably icy, water for at least twenty minutes. Drain them and dry them as thoroughly with kitchen paper. Use good quality lard or cooking oil with a high smoke point and heat it in a deep-frying pan until it's hot enough. The temperature of the fat will drop sharply, so keep the heat high under the pan. Cook until the chips are browned. Remove the frying basket, and allow the fat to get a little hotter. Then plunge the basket back in for a few minutes to complete the cooking.

#### **19.4.7 Shallow Frying (*sautéing*)**

Potatoes can be shallow fried, as an easier and quicker alternative to deep-frying. Use a floury potato (such as King Edward) and cut into cubes of about 1cm or half an inch. Heat up a sauté pan then add vegetable oil and the potatoes. Cook at a high temperature for about five minutes, stirring often, until the cubes are browned all round. At the last moment butter can be added to glaze the potatoes and some herbs or chopped shallots if needed.

#### **19.4.8 Stewing**

Stewing is a great way to take care of left over potatoes. Potato stew goes well with sausages, meatballs, or smoked, salted or gravad fish. To make stewed potatoes peel and dice the cold, already boiled, potatoes; make the cubes about 1-2 cm across. Mix flour with milk and butter in a saucepan. Bring the sauce to a boil, add the potatoes and boil gently for 5 min. Add salt, pepper and dill to taste. Indian dishes like potato curries and gravies come under this category.

### **19.5 NUTRITIONAL FACTS OF POTATOES**

- 1) Fat free, cholesterol free and low in calories - A medium-sized potato has no fat, considered cholesterol and contains only 110 calories!

- 2) Sodium Free - Low sodium diets help to reduce the risk of high blood pressure and stroke.
- 3) Vitamin C - By eating one medium sized potato, one can receive 45% of the recommended daily value of Vitamin C an antioxidant. But vitamin C is highly heat sensitive and therefore avoid cooking at very high temperature.
- 4) More potassium than bananas! - Potatoes contain 21% of the recommended daily need of potassium.
- 5) Good Source of Fiber - The 3g of fiber in one medium-sized potato is 12% of the recommended daily need. Diets high in fiber are beneficial for a healthy digestive system and may reduce the risk of cancer and heart disease. Consuming adequate fiber also makes one feel fuller, helping to reduce snacking between meals.
- 6) Less than 10% of the daily need of carbohydrates - Potatoes contain 26g of carbohydrates, only 9% of the recommended daily need. Complex carbohydrates are a good source of energy for the body.
- 7) An excellent antioxidant - Potatoes have one of the highest overall antioxidant activity among vegetables. Antioxidants protect key cell components by neutralizing the damaging effects of "free radicals" and slow down ageing. Potatoes also contain glutathione, an antioxidant that may help protect against some cancers.

## 19.6 PREPARATION OF POTATO DISHES

### 19.6.1 Preparation of French Fry

<b>French Fry</b>	
Potatoes (large)	2 nos
Oil	3 cups
Salt to taste	
<ol style="list-style-type: none"> <li>1. Peel potatoes. Slice potatoes into thin straw-like pieces.</li> <li>2. Wash well with water to remove excess starch on the surface.</li> <li>3. Place fries in a pan with water and simmer / par boil on the stove for about 15 mins.</li> <li>4. Sieve and dry fries off.</li> <li>5. Deep fry at 175°C in vegetable oil or lard / dripping for 4 to 5 minutes to a light golden crisp.</li> <li>6. Remove and place on plate with paper towels to absorb the leftover cooking oil.</li> <li>7. Transfer to another plate if necessary.</li> <li>8. Add salt and shake to ensure all french fries are evenly salted.</li> </ol>	



## 19.6.2 Preparation of Rosemary Garlic Baked Potatoes

Preparation of  
Potatoes

<b>Rosemary Garlic Baked Potatoes</b>	
Baking potatoes	4
Olive oil	4 tbsp
Garlic, chopped	2 to 4 cloves
Dried, crushed rosemary	1 tsp
Salt	¼ tsp
Fresh ground pepper	1/8 tsp
<ol style="list-style-type: none"> <li>1. Heat oven to 400°F (205°C).</li> <li>2. Wash potatoes and pierce all over with fork to prevent exploding.</li> <li>3. Lay each potato on an individual 9 inch square piece of aluminum foil (or sized to fit potato).</li> <li>4. Pour 1 tablespoon of olive oil on each potato. Make sure the entire potato skin is coated in oil.</li> <li>5. Sprinkle ¼ of the chopped garlic, rosemary, salt and pepper over the entire skin of each potato.</li> <li>6. Wrap each potato in aluminum foil.</li> <li>7. Place foil-wrapped potatoes on cookie or baking sheet (to catch any leaking olive oil).</li> <li>8. Bake in oven for 1-hour.</li> </ol>	

### CHECK YOUR PROGRESS

1. What are the various forms in which potatoes are consumed?
2. What are the points to consider while using potato?
3. What is the poison present in the grees spot on the tubers and sprouts?

### 19.7 LET US SUM UP

Potato is used in a variety of ways that include baked potatoes, masked potatoes, finger chips, French fries and the simple deep fried crispy chips.

Potatoes are easier to prepare and healthier when cooked with their skins on. Potatoes are cooked in variety of ways: boiling, mashing, roasting, baking, deep frying and shallow frying.

Potatoes contain many of the essential nutrients. It contains starch, sugar, cellulose, crude fibre, pectic substances, Protein, amino acids, organic acids, lipids, vitamin c, enzymes, minerals (P, Ca, Mg, K, Fe, S, Cl) etc. considered essential for human health.

### 19.8 LESSON END ACTIVITY

1. Try to prepare fries and chips and evaluate.
2. In preparing fries (finger chips, French fries), try with and without blanching before deep frying in oil and find out the difference.
3. Hold discussion about the use, high starch and low starch potato for fries and baked potato and discuss about their suitability.

### 19.9 KEY WORDS

**Pectin** Present in various ripe fruits and vegetables, this natural, water-soluble substance is used for its thickening properties in the preparation of jams, jellies and preserves.

**Floury** A soft, fine powder.

**Cellulose** A fibrous, complex carbohydrate.

### 19.10 QUESTIONS FOR DISCUSSION

1. Enumerate the nutritional qualities of potato?
2. What are the different methods of cooking potato?
3. How is baking and general purpose potatoes are used? Comment on their suitability.

### CHECK YOUR PROGRESS - ANSWER

1. Baked potato, masked potato, finger chips, French fries, fries, chips and as vegetables.
2.
  - i) Store potato in a cool, dark place
  - ii) Do not refrigerate potato
  - iii) Avoid prolonged exposure to light
  - iv) Remove green area or sprouts
  - v) Cut the potato into desired shape
  - vi) Put in pot and cover with cold water
  - vii) Heat until boiling
  - viii) Drain potato thoroughly
  - ix) Dry potatoes
  - x) Use boiled potatoes within 2 hours.
3. Alkaloid solanine.

### 19.11 REFERENCES

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## LESSON 20

### CHEESE

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#### 20.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Cheese and their types
- Basics of cheese making
- Storage of cheese
- Preparation of cheese dishes

#### 20.1 INTRODUCTION

“A meal without cheese is like a beautiful woman who lacks an eye” - Jean Anthel Brillat-Savarin.

"Cheese, glorious cheese!" Most people love cheese, whether in chunks or strips, or melted on bread for a grilled sandwich. Cheese is a part of the cuisine of nearly every culture, and variations on the theme are legion.

Cheese is an ancient food whose origins predate recorded history. There is no conclusive evidence indicating where cheesemaking originated. Proposed dates for the origin of cheesemaking range from around 8000 BCE (when sheep were first domesticated) to around 3000 BCE. The earliest archaeological evidence of cheesemaking has been found in Egyptian tomb murals, dating to about 2000 BCE. The earliest cheeses were likely to have been quite sour and salty, similar in texture to rustic cottage cheese or feta, a crumbly, flavorful Greek cheese.

Cheese has become the most popular milk invention. Cheese is one of the most versatile foods in a cook's arsenal. It can add flavor and texture to a dish - and may even cover a few mistakes in preparation. Cheese has served as a hedge against famine and is a good travel food. It is valuable for its portability, long life, and high content of fat, protein, calcium, and phosphorus. Cheese is a more compact form of nutrition and has a longer shelf life than the milk from which it is made.

## 20.2 CHEESE

Cheese is a food made from the milk of cows, buffalows, goats, sheep and other domesticated mammals, by coagulating the milk. This is accomplished by first acidifying it with a bacterial culture and then employing the enzyme rennet (or rennet substitutes) to coagulate the milk to form "curds and whey." The precise bacteria culture used and processing of the curds play a role in defining the texture and flavor of most cheeses. Some cheeses also feature molds, either on the outer rind or throughout.

There are hundreds of types of cheese produced all over the world. Different styles and flavors of cheese are the result of using milk from various mammals or with different butterfat contents, employing particular strains of bacteria and molds, and varying the length of aging and other processing techniques. Other factors include animal diet and the addition of flavoring agents such as herbs, spices, or wood smoke. Whether the milk is pasteurized may also affect the flavor. The yellow to red coloring of many cheeses is a result of adding annatto extract called bixin. Cheeses are eaten both on their own and cooked as part of various dishes; most cheeses melt when heated.

## 20.3 TYPES OF CHEESE

There are lots of different types of cheese and there is no standard way of classifying them. Some cheeses also fall into more than one category. They can be classified by age, country of origin, fat content, dairy content, manufacturing methods, texture and special characteristics. Steven Jenkins, a renowned American

cheese expert and member of the Confrérie des chevaliers du Taste Fromage (an elite society of cheese connoisseurs), suggests the following categories:

### **20.3.1 Fresh Cheese**

Fresh cheeses are the most basic. They're uncooked, unaged and sometimes still contain whey (the liquid part of milk). They don't keep very long and therefore need to be eaten soon after they're made. This cheese category includes mozzarella, cottage cheese, ricotta, cream cheese, farmer cheese, mascarpone and queso fresco. Fresh cheese is characterized by its soft, creamy texture and mild taste.

### **20.3.2 Semi-ripened Cheese**

Soft-ripened cheeses are semisoft in texture and sometimes have a white, or "bloomy," rind. This is created with the application of molds. Soft-ripened cheeses are usually a little more flavorful and buttery than fresh cheeses, but they're still very mild. Camembert and Brie are examples of this type of cheese.

### **20.3.3 Washed-rind Cheese**

Most varieties of "stinky" cheese, like Limburger, are washed-rind, or monastery cheese. These cheeses have reddish-orange rinds. The "stink" comes from being washed in a liquid, such as salted water, wine or beer, during the ripening phase. The washing encourages the growth of bacteria and mold, which gives the cheese a very strong smell and taste.

### **20.3.4 Natural-rind Cheese**

Some cheeses have rinds that form naturally, without the introduction of molds or bacteria. These natural-rind cheeses are usually aged and are heavier than other types of cheeses. Many of them are made from raw milk, and they include English Stilton and the French fromage de chèvre.

### **20.3.5 Blue-veined Cheese**

English Stilton is a blue-veined cheese. These cheeses resemble marble, with bluish-green veins crossing through the pale cheese. The veins are mold cultures, introduced during the cheesemaking process. Depending on the type of cheese, the mold may give it a very strong flavor. Maytag Blue, Gorgonzola and Roquefort are other examples of blue-veined cheese.

### **20.3.6 Uncooked, Pressed Cheese**

Cheddar, one of the most well-known cheeses, is an uncooked, pressed cheese. This means that the curds have not been heated and the cheese has been pressed to get rid of the liquid whey, to give it a very compact, dense texture.

### **20.3.7 Cooked, Pressed Cheese**

Cooked, pressed cheese has its curds heated before being pressed. Parmigiano-Reggiano, Gruyère and Emmental are all cooked, pressed cheeses. Within this category are pasta filata, cheeses like provolone in which the curds are stretched.

### **20.3.8 Processed Cheese**

Processed cheese isn't technically a cheese but a byproduct of the cheesemaking process. It may be made with scraps of cheese, which can also include whey, cream, water, dyes, gums and other ingredients. It has a long shelf life, melts easily and can be made in spreadable varieties. This type of cheese includes American cheese (although this name is also used for some American-made cheddars) as well as products like Cheez Whiz, Velveeta and spray cheese. However, not all processed cheese is American-made - the French La Vache Qui Rit (Laughing Cow) is also processed.

Cheese (with the exception of processed cheese) can be made with milk from mammals other than cows. Roquefort, a blue-veined cheese, and Pecorino Romano, a cooked, pressed cheese, are both made with sheep's milk. Many varieties of cheese, including soft-ripened and blue-veined, can be made with goat's milk.

## **20.4 BASICS OF CHEESE MAKING**

### **20.4.1 Curdling**

The only strictly required step in making any sort of cheese is separating the milk into solid curds and liquid whey. Usually this is done by acidifying the milk and adding rennet. The acidification is accomplished directly by the addition of an acid like vinegar in a few cases (paneer, queso fresco), but usually starter bacteria are employed instead. These starter bacteria convert milk sugars into lactic acid. The same bacteria (and the enzymes they produce) also play a large role in the eventual flavor of aged cheeses. Most cheeses are made with starter bacteria from the Lactococci, Lactobacilli, or Streptococci families.

Some fresh cheeses are curdled only by acidity, but most cheeses also use rennet. Rennet sets the cheese into a strong and rubbery gel compared to the fragile curds produced by acidic coagulation alone. It also allows curdling at a lower acidity—important because flavor-making bacteria are inhibited in high-acidity environments. In general, softer, smaller, fresher cheeses are curdled with a greater proportion of acid to rennet than harder, larger, longer-aged varieties.

### **20.4.2 Curd Processing**

At this point, the cheese has set into a very moist gel. Some soft cheeses are now essentially complete. The whey present in

drained out, salted, and packaged. For most of the rest, the curd is cut into small cubes. This allows whey to drain from the individual pieces of curd.

Some hard cheeses are then heated to temperatures in the range of 35°C - 55°C (100°F - 130°F). This forces more whey from the cut curd. It also changes the taste of the finished cheese, affecting both the bacterial culture and the milk chemistry. Cheeses that are heated to the higher temperatures are usually made with thermophilic (heat tolerant) starter bacteria which survive this step, either lactobacilli or streptococci.

Salt plays a number of roles in cheese besides adding a salty taste. It preserves cheese from spoiling, draws moisture from the curd, and firms up a cheese's texture in an interaction with its proteins. Some cheeses are salted from the outside with dry salt or brine washes. Most cheeses have the salt mixed directly into the curds.

A number of other techniques can be employed to influence the cheese's final texture and flavor. Some examples:

- **Stretching:** The curd is stretched and kneaded in hot water, developing a stringy, fibrous body. Example: Mozzarella, Provolone.
- **Cheddaring:** The cut curd is repeatedly piled up, pushing more moisture away. The curd is also mixed (or milled) for a long period of time, taking the sharp edges off the cut curd pieces and influencing the final product's texture. Example: Cheddar and other English cheeses
- **Washing:** The curd is washed in warm water, lowering its acidity and making for a milder-tasting cheese. Example: Edam, Gouda, Colby.

Most cheeses achieve their final shape when the curds are pressed into a mold or form. The harder the cheese, the more pressure is applied. The pressure drives out moisture - the molds are designed to allow water to escape - and unifies the curds into a single solid body.

### **20.4.3 Ageing**

A newborn cheese is usually salty, bland in flavor and, for harder varieties, rubbery in texture. These qualities are sometimes enjoyed, cheese curds are eaten on their own, but usually cheeses are left to under carefully controlled conditions. This ageing period (also called ripening, or, from the French, affinage) can last from a few days to several years. As a cheese ages, microbes and enzymes transform its texture and intensify its flavor. This transformation is largely a result of the breakdown of casein proteins and milkfat into a complex mix of amino acids, amines, and fatty acids.



## 20.5 STORAGE OF CHEESE

- 1) Unpasteurised cheese with a range of flavours should not be sliced until purchase otherwise it will start to lose its subtlety and aroma.
- 2) Keep the cheese in conditions in which it matures. Hard, semi-hard and semi-soft cheeses are stored in the temperatures from around 8° – 13° C.
- 3) Keep the cheese wrapped in the waxed paper and place it in a loose-fitting food-bag not to lose humidity and maintain the circulation of air.
- 4) Chilled cheeses should be taken out of the refrigerator one and a half or two hours before serving.
- 5) Cheeses contain living organisms that must not be cut off from air, yet it is important not to let a cheese dry out.
- 6) Do not store cheese with other strong-smelling foods. As a cheese breathes, it will absorb other aromas and may spoil.
- 7) Wrap soft cheeses loosely. Use waxed or greaseproof paper rather than cling film.
- 8) Let cold cheese warm up for about half an hour before eating to allow the flavour and aroma to develop.

## 20.6 PREPARATIONS OF CHEESE DISHES

### 20.6.1 Preparation of Cheese Sauce

<b>Cheese Sauce</b>	
Cheese	100 gms
Flour	2 tbsp
Salt	½ tsp
Pepper powder	¼ tsp
Mustard	½ tsp
Butter	2 tbsp
Milk	2 cups
<ol style="list-style-type: none"> <li>1) In a pan, melt butter.</li> <li>2) Add flour to it and make smooth paste.</li> <li>3) Cook till the mixture turns bubbly.</li> <li>4) Gradually add the milk. Stir and cook till smooth and thick.</li> <li>5) Add pepper, salt and mustard. Now mix grated cheese and again cook. Cook till cheese melts.</li> <li>6) Cheese Sauce is ready.</li> </ol>	

### 20.6.2 Preparation of Cheese Omelet

<b>Cheese Omelet</b>	
Grated Parmesan cheese	1/3 cup
Finely chopped parsley	1 tbsp
Finely chopped fresh mint	1 tbsp
Eggs	4
Milk	¼ cup
Finely chopped scallions	¼ cup
Butter	2 tbsp
Salt and black pepper to taste	
<ol style="list-style-type: none"> <li>1. In a mixing bowl beat the eggs with the salt and pepper until it starts bubbling.</li> <li>2. Beat in the milk, mint, parsley, scallions, and cheese until well homogenised.</li> <li>3. Add the egg mixture and mix the contents thoroughly.</li> <li>4. In a heavy skillet melt the butter over moderate heat.</li> <li>5. Pelt in the egg mixture and spread it out evenly.</li> <li>6. Reduce the heat to low and cover it fully and cook until the edges of the omelet begin to get firm. Uncover and run a spatula around the edges to keep it from sticking to the pan.</li> <li>7. When the center of the omelet is almost firm, place a plate over the skillet and invert, dropping the omelet onto the plate. Gently slide it back into the pan, cover, and cook for a few minutes longer until the underside is lightly browned.</li> <li>8. Slide out onto a serving plate, cut into wedges, and serve hot once.</li> </ol>	

#### **CHECK YOUR PROGRESS**

1. How do you induce curdling in milk?
2. What are the procedures in cheese making?
3. What are the different types of cheeses available commercially?

#### **20.7 LET US SUM UP**

Cheese is the curd of milk, coagulated usually with rennet, separated from the whey, and pressed into a solid mass in a hoop or mold.

There are hundreds of types of cheese produced all over the world. Different styles and flavors of cheese are the result of using milk from various domesticated animals such as cow, buffalo, sheep

and goat or with different butterfat contents, employing particular species of bacteria and molds, and varying the length of aging and other processing treatments.

Cheese are generally prepared by curdling with the addition of bacterial culture or by adding vinegar or lime juice. After curdling, it is aged and then processed before packaging.

### 20.8 LESSON END ACTIVITY

1. Check various cheeses available in your pantry and record their appearance, consistency, colour, texture and flavour and record them
2. Know various food applications of cheese.
3. If raw materials and ingredients are available try to make cheese and record your observations.
4. Practice making different cheese dishes, taste them and record your observations.

### 20.9 KEY WORDS

<b>Coagulate</b>	To cause transformation of (a liquid or sol) into a soft, semisolid, or solid mass.
<b>Acidify</b>	To make or become acid.
<b>Microbes</b>	A minute organism usually producing disease: bug, germ, and microorganism.

### 20.10 QUESTIONS FOR DISCUSSION

1. Give a brief description about cheese.
2. Write a short note on storage of cheeses.

### CHECK YOUR PROGRESS - ANSWER

1. It is either done by the addition of bacterial cultures or by adding acidifying products such as vinegar or lime juice.
2. Milk is first curdled followed by aging and processing prior to packaging and marketing.
3. Fresh cheese, semi-ripened cheese, washed-rind cheese, natural-rind cheese, blue-veined cheese, uncooked pressed cheese, cooked pressed cheese and processed cheese.

### 20.11 REFERENCES

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## LESSON 21

### FOOD STORAGE AND REHEATING

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#### 21.0 AIMS AND OBJECTIVES

At the end of this lesson, students should be able to demonstrate appropriate skills, and show an understanding of the following:

- Principles of food storage
- Recommended storage for various foods
- Storage guidelines
- Reheating of food

#### 21.1 INTRODUCTION

Food is stored by almost every human society and by many animals. Storing of food has several main purposes:

- to tide over periods of scarcity or famine
- taking advantage of short term surplus of food as at harvest time
- enabling a better balanced diet throughout the year
- preparing for special events and celebrations
- planning for catastrophe or emergency
- protection against predators or others.

Storage does not improve the quality of any food. The quality of a food will also not decrease significantly during storage as long as the food is stored properly and used within the recommended time frame.

Quality is not synonymous with safety. A poor-quality food may be safe such as stale cereal, overripe fruit or soured pasteurized milk. An unsafe food may have good quality in terms of appearance and taste, but have a high (unsafe) bacterial count. For example, improperly canned food may contain *Clostridium botulinum* (which causes botulism) thus making food unsafe. Or cooked chicken may be placed on a plate that held the raw chicken and become contaminated. The objective of home food storage is to provide both safe and high-quality foods.

Maintaining a food's quality depends on several factors: the quality of the raw product, the procedures used during processing, the way the food is stored and the length of storage. For example, fresh-picked corn will store better than corn that has been in the market for a few days; a tightly folded inside cereal box liner will prevent a ready-to-eat cereal from becoming limp. The recommended storage time takes these factors into consideration.

Food comes in many forms. Fresh, frozen, dehydrated, canned, salted/ cured, pickled, smoked, and pasteurized food can all play a role in a good storage system. All of these foods require some energy for their production, harvesting, preservation, storage, and preparation (cooking). In the absence of traditional energy sources some food forms may not be available or may not store for the normal shelf-life period. It is possible to convert some forms of food with short shelf-life into other forms with longer shelf-life.

## 21.2 FOOD STORAGE

Food storage is: Any food “saved” to be eaten at a later time (hours, days, or years).

Storage includes food in the refrigerator or freezer, vegetables in a garden or fruit on a tree, livestock, or food stored in a storage room. Management of this food is a vital part of food storage. Food is perishable even when stored properly under the most favorable circumstances and conditions. Proper storing and rotating food will preserve nutritional quality, eating quality, and eliminate waste.

The main reason to store food should be to use it at a later date or convenient time. Properly stored foods and rotated foods will provide:

- Management of resources (time, money, energy, skills, foods, etc.)—providing self sufficiency.
- Preparedness for time of need / want.

## 21.3 STORAGE LIFE (SHELF LIFE)

Quality and nutritive value of food deteriorates during storage, therefore foods should not be held for long periods beyond their established shelf-life. When food is stored too long, there is the risk of two things happening:

color, flavor, aroma, texture or appearance deteriorate to a level where people will not consume the food, and

nutrient deterioration may be severe enough to render the food an unreliable source of specific nutrients.

### 21.3.1 Causes of Deterioration

#### **Self Destruction:**

All living systems, whether plant or animal, were designed with a self-destruction mechanism. With death or harvest, this mechanism is activated. If allowed to proceed, naturally occurring enzymes in the food will cause discoloration, and undesirable flavor and textural changes such as when an apple rots or banana over-ripens. As animals and plants are slaughtered or harvested, they lose in-built protective devices present in the a living system. When wheat is ground, the kernel dies and becomes vulnerable to rancidity.

#### **Microorganisms:**

Bacteria, yeasts and molds are the most common causes of spoilage of food and foodborne illness. Processing methods are designed to control microorganisms by either killing them by heat (eg. canning) or preventing their growth (eg. drying or freezing). It is important to realize that a food which is safe due to inhibition of microorganisms loses that safety when conditions change. Dried beans that are cooked are no longer safe to store at room temperature. When meat is thawed, it still contains living organisms and therefore must be held under refrigeration and used within a fairly short time period.

#### **Insects and Rodents:**

Rodents deposit waste products feces and urine in stored grains. Insects grow in flour, hatching eggs, to produce larvae. Cleanliness and good packaging are important in the avoidance of both problems.

#### **Contamination:**

Stored food can become unsafe to consume from contact with undesirable substances and poisonous products. Be aware of what nonfood material is in close proximity to the

stored food. This includes packaging in nonfood-approved substances such as storing wheat in plastic garbage bags.

### **Chemical Changes:**

Flavor and color changes can occur during storage; especially when stored in packages which do not exclude air and light. Baking powder can lose its sizzle and baked products won't rise.

## **21.4 RECOMMENDED STORAGE FOR VARIOUS FOODS**

Foods are divided into three groups for the purpose of storage; they are:

- |                         |  |
|-------------------------|--|
| <b>Perishable foods</b> | include: meat, poultry, game, fish; dairy produce and fats; vegetables and fruit.  |
| <b>Dry foods</b>        | include: cereals, pulses, sugar, flour, etc.; bread, cakes; jams, pickles and other bottled foods; canned foods; cleaning materials. |
| <b>Frozen foods</b>     | must be placed immediately into a deep freeze at a temperature of -2°C (28°F).   |

### **21.4.1 Storage of Perishable Foods**

#### **Vegetables:**

- Most fresh vegetables may be stored up to 5 days in the refrigerator. Removing air (oxygen) from the package, storing the vegetables at 40°F refrigerated temperatures, and maintaining optimum humidity (95 to 100%) may extend shelf-life of fresh vegetables.
- Always wrap or cover fresh leafy vegetables in moisture-proof bags to retain product moisture and prevent wilting.
- Root vegetables (potatoes, sweet potatoes, onions, etc.) and squashes, eggplant, and rutabagas should be stored in a cool, well-ventilated place between 50°F and 60°F.
- Tomatoes continue to ripen after harvesting and should be stored at room temperature.
- Removing the tops of carrots, radishes, and beets prior to refrigerator storage will reduce loss of moisture and extend shelf-life.
- Palatability of corn diminishes during cold storage due to elevated starch content. Corn and peas should be stored in a ventilated container.
- Lettuce should be rinsed under cold running water, drained, packaged in plastic bags, and refrigerated. Proper storage of fresh vegetables will maintain quality and nutritive value.
- Canned vegetables can be stored in a cool, dry area below 85°F (optimum 50°F to 70°F) for up to one year. After one



year, canned vegetables may still be consumed. However, overall quality and nutritional value may have diminished. Discard badly dented, swollen, and/or rusty cans.

**Fruit:**

- Store fresh fruit in the refrigerator or in a cold area to extend shelf-life. Reduce loss of moisture from fresh fruit by using, covered containers. Always store fresh fruit in a separate storage area in the refrigerator, since fresh fruits may contaminate or absorb odors from other foods. Prior to consumption, rinse fresh fruits and vegetables under cold running water to remove possible pesticide residues, soil, and/or bacteria. Peeling, followed by washing of fresh fruits and vegetables, is also very efficient in removing residues.
- Ripe eating apples should be stored separately from other foods in the refrigerator and eaten within one month. Apples stored at room temperature will soften rapidly within a few days. Remember to remove apples that are bruised or decayed prior to storage in the refrigerator. Do not wash apples prior to storage.
- Green pears and apricots should be ripened at room temperature and then stored in the refrigerator. Expect a 5-day refrigerated shelf-life for these fruits.
- Unripe peaches may be ripened at room temperature and eaten after 2 days. Store ripe peaches in the refrigerator but consume at room temperature.
- Grapes and plums should be stored in the refrigerator and eaten fresh within 5 days of purchase. Store unwashed grapes separately from other foods in the refrigerator and wash prior to consumption.
- Ripe strawberries can be stored in the refrigerator separately from other foods for approximately 3 days. Strawberries should be washed and stemmed prior to consumption.
- Citrus fruits, such as lemons, limes, and ripened oranges, can be stored in the refrigerator for 2 weeks. Grapefruit may be stored at a slightly higher temperature of 50°F.
- Melons, such as the honeydew melon, cantaloupe, and watermelon, may be ripened at room temperature for 2, 3, and 7 days, respectively. Store ripe melons in the refrigerator.
- Avocados and bananas should be ripened at room temperature for 3 to 5 days. Never store unripe bananas in the refrigerator, since cold temperatures will cause the bananas to rapidly darken.
- Canned fruit and fruit juices may be stored in a cool, dry place below 85°F (optimum 50°F to 70°F) for one year. As with canned vegetables, badly dented, bulging, rusty, or leaky cans should be discarded. Dried fruits have a long shelf-life because moisture has been removed from the product.

### **Dairy Products:**

- The shelf-life of fluid milk stored in the refrigerator (<40°F) will range from 8 to 20 days depending upon the date of manufacture and storage conditions in the grocers shelf. Milk is a very nutritious and highly perishable food. Milk should never be left at room temperature and always capped or closed during refrigerator storage. Freezing milk is not recommended, since the thawed milk easily separates and is susceptible to development of off-flavors.
- Dry powder milk may be stored at cool temperatures (50°F to 60°F) in airtight containers for one year. Opened containers of dry milk, especially whole milk products, should be stored at cold temperatures to reduce off-flavors. Handle reconstituted milk like fluid milk and store at refrigeration temperatures if not used immediately.
- Canned evaporated milk and sweetened condensed milk may be stored at room temperature for 12 to 23 months. Refrigerate opened canned milk and consume within 8 to 20 days.
- Natural and processed cheese should be kept tightly packaged in moisture-resistant wrappers and stored below 40°F. Surface mold growth on hard natural cheese may be removed with a clean knife and discarded. Rewrap cheese to prevent moisture loss. Presence of mold growth in processed cheese, semi-soft cheese, and cottage cheese is an indicator of spoilage and thus these foods should be discarded.
- Store commercial ice cream at temperatures below 0°F. Expected shelf-life of commercial ice cream is approximately 2 months before quality deteriorates. Immediately return opened ice cream to the freezer to prevent loss of moisture and development of ice crystals. Store ice cream at constant freezer temperatures to slow growth of ice crystals.

### **Meats, Poultry, Fish and Eggs**

- Meat, poultry, fish, and eggs are highly perishable and potentially hazardous due to their high moisture and high protein content. Generally, fresh cuts of meat contain spoilage bacteria on the surface that will grow, produce slime, and cause spoilage after 3 days of refrigerator storage in oxygen-permeable packaging film. Ground meat products are more susceptible to spoilage due to possible contamination during manufacturing process and increased surface area of the product. Bacteria in ground meats are distributed throughout, providing rapid growth in the presence of air. Ground meats should be stored on the lower shelf of the refrigerator and used within 24 hours of purchase. Refrigerator storage slows bacterial growth; however, the product will eventually spoil. Optimum storage temperature of refrigerated meats, including ground beef, is 33°F to 36°F.

- Freezing inhibits the growth of bacteria. Whole cuts of meat may be stored in the freezer ranging from 4 to 12 months, whereas ground meat may be stored for 3 to 4 months. For maximum storage, wrap meats in moisture-proof, gas impermeable packaging to prevent freezer burn.
- Cured meats, such as bacon, should be stored in their original packaging in the refrigerator. Cured meats have a tendency to become rancid when exposed to air. Therefore, rewrap cured meats after opening the package. Expect approximately a 1-week shelf-life for cured meats. Vacuum-packaging (removal of air) and modified atmospheric packaging (partial removal of air) extends shelf-life of meats and meat products (i.e. luncheon meats). The shelf-life of vacuum-packaged meats and gas-flushed meats is 14 days and 7 to 12 days, respectively.
- Poultry should be prepared within 24 hours of purchase or stored in the freezer. Poultry may be stored in the freezer (0°F) for 12 months. Thaw poultry in the refrigerator, under cold running water, or in the microwave. Cook poultry parts (i.e. breast and roast) and whole poultry to an internal temperature of 170°F, and 180°F, respectively. Leftovers stored in the refrigerator should be consumed within 3 days and reheated to 165°F prior to consumption. Poultry broth and gravy should not be stored more than 2 days in the refrigerator and reheated to a full boil (212°F) before consuming.
- Fresh fish, shrimp, and crab stored in the refrigerator (slightly above 32°F) should be consumed within 1 to 2 days. Never store fresh fish in water due to leaching of nutrients, flavor, and pigments. Frozen fresh lean fish and seafood (except shrimp) may be stored for 3 to 6 months at 0°F. Shrimp may be stored for 12 months at 0°F.
- Eggs should be purchased refrigerated and stored in the refrigerator (33°F to 37°F) in their original carton. Storage of eggs in the original carton reduces absorption of odors and flavors from other foods stored in the refrigerator. Use eggs within 3 to 5 weeks of the "pack date" listed on the carton (1 to 365 representing pack date day within the year). Leftover egg yolks and egg whites may be stored in the refrigerator covered for 2 and 4 days, respectively. Cover egg yolks with water. Hard-boiled eggs may be stored in the refrigerator for 1 week, whereas pasteurized liquid eggs may be stored in the refrigerator for 10 days. Egg whites and pasteurized eggs may be stored at freezer temperatures for one year. Shell eggs should never be stored in the freezer. Dried eggs may be stored in tightly closed containers in the refrigerator for one year.

### 21.4.2 Storage of Dry Foods

#### Breads, Cereals, Flour and Rice:

- Bread should be stored in the original package at room temperature and used within 5 to 7 days. However, bread stored in the refrigerator will have a longer shelf-life due to delayed mold growth and may be firmer. Expect a 2- to 3-month shelf-life of bread stored in the freezer. Refrigerate cream style bakery goods containing eggs, cream cheese, whipped cream and/or custards for no longer than 3 days.
- Cereals may be stored at room temperature in tightly closed containers to keep out moisture and insects. Whole wheat flour may be stored in the refrigerator or freezer to retard rancidity of the natural oils.
- Store raw white rice in tightly closed containers at room temperature and use within one year. Brown and wild rice stored at room temperature will have a shorter shelf-life (6 months) due to the oil becoming rancid. Shelf-life of raw white and brown rice may be extended by refrigeration. Cooked rice may be stored in the refrigerator for 6 to 7 days or in the freezer for 6 months.

#### Water:

- Commercial bottled water has an extended shelf-life of one to two years due to extensive water treatment (filtration, demineralization, and ozonation) and strict environmental controls during manufacturing and packaging. Bottled water should be stored in a cool, dry place in the absence of sunlight. Household tap water has a limited shelf-life of only a few days due to the growth of microorganisms during storage. Therefore, consumers should purchase bottled water if planning to store water for extended periods

### 21.4.3 Storage of Dairy Foods

#### Frozen Dairy Products:

- When purchasing ice cream and other frozen desserts at the store, make sure they are frozen solid and that the container is not sticky or frosted which indicates it has partially thawed at some point. Request that the ice cream be placed in an insulated bag or be double bagged to reduce melting on the way home.
- Ice cream may be stored unopened for up to two months at 0 °F or below. However, if it is to be stored for longer than one month, it is best to over-wrap the original container with freezer paper or wrap.
- Once the container has been opened, place saran wrap over the surface of the ice cream to minimize the development of large ice crystals and the loss of its creamy texture. Use ice cream within seven to ten days for best quality. Each time the

ice cream is removed from the freezer, and the surface begins to thaw, the ice cream loses quality. If ice cream or other frozen dairy products thaw completely, they should be discarded because of the danger of bacterial growth.

### **Nondairy Dessert Toppings:**

- Nondairy dessert toppings are made from vegetable oils, but may also contain some milk products. The frozen toppings may be stored for up to one year in the freezer, or thawed and kept in the refrigerator for up to two weeks. Do not freeze dessert toppings in aerosol cans. Store the cans in the refrigerator for a maximum of two to three months.

## **21.5 STORAGE GUIDELINES**

For best results in maintaining product quality, practice the rule, First In, First Out (FIFO). This means the oldest products should be used first and the newest products later. A good practice is to place the newly purchased products in back of the same products already on the shelf. Follow recommended storage times for the refrigerator, freezer and pantry:

### **Freezer:**

- Keep freezer temperature at or below 0 °F. A good indication of proper temperature is that ice cream will be frozen solid.
- Use moisture-proof, freezer-weight wrap. Examples are foil, freezer bags and freezer paper. Label and date all packages.
- Food stored beyond the recommended time will be safe to eat, but eating quality (flavor and texture) and nutritive value may be reduced.
- Keep an inventory of freezer contents.

### **Refrigerator:**

- Use a thermometer to check temperature; it must be between 34 °F and 40 °F at all times. Avoid frequently opening the refrigerator door, especially in hot weather.
- Wrapping perishable food prevents the loss of flavor and the mixing of flavor and odors resulting in, for example, onion-flavored milk.
- Raw meat and poultry should be wrapped securely so that they do not leak and contaminate other foods. Place the store packages in a plastic bag or place the package on a plate to contain any juices. Clean up leaks with warm soapy water and sanitize with a solution of 1 teaspoon chlorine bleach to 1 quart water.
- Cooked meats and leftovers should be tightly wrapped to prevent leakage and drying out.

### **Pantry:**

- Storage cabinets should be cool and dry. Storage areas near oven ranges, hot water pipes or heating ducts should not be used because heat and moisture can cause a food to lose its quality more rapidly.
- Insect infestation can occur in any home. Susceptible foods include cereals, flour, seeds, baking mixes, spices, candy, dried fruits and dry pet foods. Avoid purchasing damaged packages of foods and keep cupboard shelves clean. Storing food in tightly sealed glass, metal or rigid plastic containers may help.
- Pantry foods will probably be safe beyond recommended storage time, but eating quality (flavor and texture) and nutritive value may be reduced.

## **21.6 REHEATING OF FOOD (RECHAUFFE COOKING)**

Rechauffe is the utilization of the “left-overs” by the reheating and redressing of already cooked foods. Although freshly cooked food is better than any which has been reheated, from an economical standpoint, it is therefore an important branch of cookery.

### **General Rules for Reheating Foods:**

- 1) Cooking does not kill all harmful bacteria, especially bacterial spore survive heat since they are heat tolerant. After cooking, the remaining bacteria can grow rapidly when the food is cooling and being re-heated.
- 2) In order to kill any food poisoning bacteria present, food needs to reach a temperature of 70°C (158°F) and cook at that temperature for at least 2 minutes.
- 3) Cooked food should be cooled as quickly as possible before putting it in the fridge or freezer. Small quantities will cool quite quickly but larger quantities should be either divided into smaller portions, or transferred to a container with a large surface area stirring the contents may help cooling faster. During warm weather, stand the container in a larger bowl of iced water. Do not cover the food while it is cooling.
- 4) Never recook, only reheat
- 5) Make use of all the scraps of foods, but be sure that they are not spoilt.
- 6) To improve the taste for fish, white meat, lemon juice, parsley, nutmeg could be added.
- 7) The flavourings and seasonings, when mixed with finely minced meat, blend better and heat penetrates quickly to all parts and this reduces the reheating time. Fish can be flaked and blended with spices.



- 8) The addition of moisture in the form of gravy or sauce is necessary for the reheated meat dish, whether it is incorporated inside or served separately as it provides moisture to the dish and improves the taste.
- 9) If raw ingredients are to be added to the rechauffe dishes, they must be cooked first, as the short time employed for reheating does not allow time for raw food to be thoroughly cooked e.g. onions in croquette mixture, potatoes in fish cakes, and rice in cutlet mixture.
- 10) Rechauffe dishes should be dished neatly, decorated and garnished.
- 11) Never reheat food more than once.
- 12) Always reheat food until it is 'piping hot'.

### CHECK YOUR PROGRESS

1. Maintaining food quality depends on what factor?
2. What are the forms in which foods come?
3. Define shelf-life.

### 21.7 LET US SUM UP

Storage does not improve the quality of any food. The quality of a food will also not decrease significantly during storage as long as the food is stored properly and used within the recommended time frame. Storage includes food in the refrigerator or freezer, vegetables in a garden or fruit on a tree, livestock, or food stored in a storage room. Management of this food is a vital part of food storage. Food is perishable even when stored properly under the most favorable circumstances and conditions. Proper storing and rotating food will preserve nutritional quality, eating quality, and eliminate waste.

Quality and nutritive value of food deteriorates during storage. Therefore foods should not be held for long periods beyond their established shelf-life. Rechauffe is the utilization of the "left-overs" by the reheating and redressing of already cooked foods. Although freshly cooked food is better than any which has been reheated, from an economical standpoint it is therefore an important branch of cookery.

### 21.8 LESSON END ACTIVITY

1. Place five vegetables (of same type) in different closed containers, take each container one by one in the consecutive days. Note the colour, texture and smell of the vegetables on each day.
2. Try reheating various foods.



### 21.9 KEY WORDS

- Catastrophe** A great, often sudden calamity.
- Pasteurize** To kill bacteria and other microbes by heating milk or other liquids to moderately high temperatures for a short period of time.
- Perishable** Foodstuff subject to decay or spoilage.
- Rancidity** The development of unpleasant flavours in oils and fats as a result of oxidation. It is usually due to production of Free Fatty Acid (FFA) during storage of oil.
- Crouquette** A small cake of minced food, such as poultry, vegetables, or fish, that is usually coated with bread crumbs and fried in deep fat.

### 21.10 QUESTIONS FOR DISCUSSION

1. Enumerate the purpose of storing food?
2. Write a note on storing perishable foods?
3. What are the general rules for reheating food?

### CHECK YOUR PROGRESS - ANSWER

1. Quality of raw product, method of cooking, method of storage and length of storage.
2. Fresh, frozen, dehydrated, freeze dried, canned, salted / cured, pickled, smoked, and pasteurized.
3. A time frame to which the food can be stored without quality deterioration or development of toxicity.

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## MODEL QUESTION PAPER

Bharathiar University, Coimbatore.

Course	: B.Sc. (Catering Science & Hotel Management)
Subject	: Food Production and Patisserie - I
Time	: 3 hours
Total Marks	: 5 x 20 = 100
Direction	: Answer any five questions only

1.
  - i) What are the aims and objectives of cooking?
  - ii) Discuss the advantages of cooking.
  - iii) What are the various effects of cooking on food constituents?
2.
  - i) What are effects of cooking on different ingredients?
  - ii) What are the uses of fats and oils?
  - iii) Explain any five basic methods of cooking egg.
3.
  - i) Write a short note on culinary art.
  - ii) What are the points that need to be noted while washing fruits or vegetables?
  - iii) Explain:
    - a) Grating
    - b) Mincing
    - c) Mashing
    - d) Julienninng
    - e) Homogenisation
4. Give a brief account about the principles, merits and demerits of microwave cooking.
5.
  - i) Give the brief description about the varieties of herbs.
  - ii) What are the culinary uses of herbs?
6.
  - i) Define the term culinary fruit
  - ii) Give a brief description about nuts and give five examples
  - iii) What are stone fruits? Explain a few with its edible use
  - iv) Enumerate briefly about tropical fruits with examples.
  - v) Differentiate between watermelons and persion melons.
7. Explain the different cuts of beef in detail.
8. Enumerate the purpose of storing food.