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# UNIT-1

## INTRODUCTION TO THE ART OF COOKERY

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## 1.1 INTRODUCTION

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Cookery is defined as a “chemical process” the mixing of ingredients; the application and withdrawal of heat to raw ingredients to make it more easily digestible, palatable and safe for human consumption. Cookery is considered to be both an art and science. The art of cooking is ancient. The first cook was a primitive man, who had put a chunk of meat close to the fire, which he had lit to warm himself. He discovered that the meat heated in this way was not only tasty but it was also much easier to masticate. From this moment, in unrecorded past, cooking has evolved to reach the present level of sophistication. Humankind in the beginning ate to survive. Now also we still eat to survive, however efforts have been made to make the food more enjoyable like cooking meats and vegetables in different ways to make them more easily eaten, digestible and to make them more attractive, palatable and to have wider choice. This is the art associated with the preparation of food. However it is not solely the artful manipulation and

combination of food which results in good tasting products. Nutritional aspects, the effects of combining various foodstuffs and the use of modern technology can be considered the science of cooking. The “how of cooking” can be considered to be the art and the “why of cooking” could be the science. Balancing the art and science must be the goal of every professional chef.

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## 1.2 OBJECTIVE

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The objective of this unit is to make the students learn and understand:

- The evolution of cookery from ancient times to modern age.
- To understand the most popular cuisines of the world.
- To gain knowledge about human feeding habit and their well-being.

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## 1.3 CULINARY HISTORY

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**Development of the culinary art from the middle ages to modern cookery:** The phrase “a brief history of culinary preparation” is, at best, misleading and, at worst, a bald faced lie. It is not possible to do justice, in a brief manner, to a subject, which is equivalent to the history of human race. This art and science began more than 300,000 years ago when, according to carbon dating, man began to use fire for the preparation of food. There have been very few discoveries or inventions of humanity since fire that have been not affected, in some manner, the preparation of food. When was salt first used in food preparation? How did various spices and herbs begin to be used? These and many other questions concerning the history of food preparation cannot be answered. However, as archaeology has slowly uncovered the ancient civilization around the world, it has unearthed an increasingly large body of knowledge concerning the world over.

When humans first used herbs and spices is not known, but their importance in the ancient world is known. The acquisition of these and other foodstuffs was a prime factor in the development of trade routes throughout both the western and eastern hemispheres. Alexander the great brought to Greece spices from the Orient and melons and other fruits from Persia. The trade routes begun by Alexander were later used by the Ptolemy’s of Egypt and then by the Roman Empire. Spices and herbs hold a special place in the history of mankind, having been as eagerly sought as gold, silver and jewels.

A less glamorous culinary cousin of spices, grain has always been the key to the might of nations. The treasures of Africa were not simply gold, ivory and jewels of Rome. Africa was more important as the breadbasket of the Empire. The pound of grain, which was the right of every citizen of Rome, came from the fertile fields of North Africa. It was to protect these shipments of grain that the Roman Empire cleared the Mediterranean Sea of pirates and built a system of roads, many parts are still in use today.

Historically, the procuring of various foods has always been of great significance for the Roman Empire it was gram, or the English Empire tea and sugar. Culinary development initially was tied to developments within an individual country or region; however as each region came in contact with people from other areas, ideas were

exchanged. The result was a traceable progression in the development of food preparation from the Egyptians, to the Assyrians, to the Babylonians, to the Greeks, to the Romans, and then direct forerunners of the French kitchen. The French kitchen is the cornerstone for most historians of the beginning of modern dining in the western world.

A pattern of refinement and development of culinary preparation began with the early Egyptians rulers and continued to the time of Persians. The Greeks refined the tradition of cooking; in fact Greek contribution towards the kitchen was frying pan and few other things. The citizens of early Rome were admirers of all things Greek made and invented, but the development of cuisine in the region of Rome is an example of how cuisines have developed in regions all over the world. In the Roman Empire there were two levels of culinary development taking place simultaneously. The one most often discussed is that of the ruling elite and their effect on foods. The Romans are to be credited with introducing to the rest of Europe a sense of culinary art.

At the age of 14 years a young man name Grillaume of Tirel was a kitchen boy who cooked huge roast in front of the open fire. This young boy was destined to be the founder of the movement towards the modern French kitchen. Throughout the twentieth century the kitchen and menu have been streamlined. Preparations have come to be viewed from the standpoint of nutritional value as well as taste. There is no question that the history of culinary preparation has just begun, whether the issue is kitchen organization, style of service, cuisine and many other issues.

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### **1.3.1 CULINARY HISTORY OF INDIA**

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Culinary skills and arts of a country are backed by the “origin” which can precisely be termed as “Culinary History”. The origin of each country’s eating habits however have arisen due to the influence from within the country itself or from its neighbors and some other influence such as climatic conditions, agriculture, religious aspects etc. Indian cooking has developed—from a purely vegetarian style to today’s mixed style in the process, artistically absorbing the culinary styles of all the subcontinents, past invaders which include Persians, Greeks, Romans, Mugals, French, Portuguese and the British. Over 5,000 years of recorded history and even before, one gathers from its legends and great epics, India had been invaded by armies, traders and immigrants from all over the world. Some of the conquerors were the Aryans during the second millennium BC, the Greeks, led by Alexander the great in 326 BC, the Mugals in the 16th Century, the British in the 18th and 19th centuries, but these were interspersed with more observe and more exotic incursions of Mugals, Sythian, Psthians, Kushans, Arabs, Turks, Afghans, Portuguese and Dutch and throughout this successions of invaders there remained pockets of tribal and aboriginal life in the more daunting mountain, country and in the less accessible inland areas.

After the independence and partition of India, there was a mass exodus of people to Great Britain, Africa and other parts of the world. They took with them eating habits and spices, and soon Africa started cultivating those spices. The mass migration of Asians in the 60’s and 70’s from east Africa and the sub–continent to Great Britain and other parts of Europe brought Indian food to the notice of everyone. The sub-continent of India and Pakistan covers about 4 million sq. km. and comprises of many different cultures and

regions of which the main being Hindus and Muslims. Equally in the matter of religion an exceedingly important even crucial aspect of Indian life, the country displays a profession of faith, practices and observances as it is the home of Hinduism, and Buddhism and the religions of the Jains, the Sikhs etc. India as mentioned earlier has a large population of Muslims and Hindus and contains as well different seats of Christians, one of the oldest settlements of Jews in the world. Zoroastrians, animists and a number of minor faiths all of these have contributed too in their own manner and ways and attributed to the rich texture of Indian life and living.

After all these centuries of foreign contact, India and most of the South East Asia should still be screened from the western world be such a formidable barrier of fantasy, half-truths, misconceptions and sheer ignorance. Even food, one of the first and most immediate contacts a traveler makes with a foreign country remains virtually unexplored and a great and varied cuisine involved from indigenous sources and outside culture seems to have been reduced in western mind. Travel brings about a maximum contact of food habits of various countries, thereby spreading of spices and delicious.

Common culinary skills inherited over the years in each type of:

1. Rotis or Indian bread.
2. Rice preparation.
3. Meat, fish and vegetable with grinding of masalas.
4. Indian sweets.

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### **1.3.2 HISTORY OF COOKING**

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The story of food service is long and interesting, one dating far back to the very beginning of civilization. Humans began eating the product of their picking such as mushrooms, roots, and fruits. Then, they began to kill or catch animals and eat their flesh. In the same time, they used and then made fire, cooked meat or flesh was first eaten, said the legend, by accident when someone dropped his share of meat in the fire and discovered it was better. The same happened with the use of salt when someone dropped his food on a piece of rock where seawater had evaporated. Later, one was introduced agriculture and both cereals and pulses were grown as well as fruit trees introduced by the Romans (peaches, lemon, cherries, apricots, walnuts and plums) from there faraway trips to Eastern countries. Game meat was the almost unique one eaten until came Geese and Pork breeding. The Romans also taught French how to make bread and wine, which has remained the French staple diet even today. Cumin and vinegar were the first spices and condiment used. Onion and garlic the main aromatics. Spices came from Asia and were highly priced. At the period of III century most of the commodities were used. In a kitchen, one could find ginger, cloves, chilies, saffron, nutmeg, bay leaf, cumin and turmeric when the spice road was opened.

Soups were served – origin of the word “Soup” comes from the Old French language where a “Soupe” was a slice of bread. Other says it comes from Sanskrit words Su (well) Pa (feed) giving “Supa” good food. This detail is taken from the very first French Cookery Book (“The Master”) given by Philip VI and Charles V. Guillamme Tirel, Larder Master of the Royal Kitchens was the first known famous Chef de Cuisine (1392) and still today, a restaurant in Paris has his name.

**Egypt Birth place of Industry:**

6000 years ago, human beings wandered into a region along the Nile river, which is called Egypt today, and found it better suited to their needs, so they settled there. The climate was gentle, there was adequate supply of food and water, so people at least found it possible to abandon a daily search for essentials to apply their talents to other things. Ancient Egypt was a simple agricultural society. Major crops were wheat and barley that was ground into flour for bread. Barely was combined with dates to produce the world first beer. Vegetables like pumpkin, onion, leeks, radishes, watermelons were grown. They raised cattle duck and geese. The Egyptians learned to press oil from olives and sesame seeds and used it regularly in cooking. They used honey with their daily bread, they also made wine.

Nearly 4000 years after civilization first took route along the Nile, Egypt was at its peak of prosperity. The entire region was alive with activity, the pyramids were under construction, agriculture was producing abundantly, artisans were creating works of great beauty, and the industries of the country were manufacturing new products in increasing volumes. The only problem was one of distribution for the goods produced and in due course a new class of merchants of Egypt traveled far and wide on foot or in caravans and they were compelled to provide themselves with meat and if the merchants did not want to cook, cooks came along. Travelling in this way becomes complicated and tedious. So finally inns appeared along the frequently traveled trade routes. They were crude shelters, but they ensured a degree of safety and comfort without the burden of a huge caravan.

In the beginning the inns provided only lodging and the travelers continued to supply their own food, but in due time this too became the inn keepers service. Much of the food we eat today was first discovered in this period and many of the techniques we use to prepare food are simply modification of system first used by these ancient people. Our modern stove and oven grew from their invention of charcoal burner, which was a cylindrical earthenware about 3 in height with 2 metal grills one for the charcoal fire and the other was the shelf on which the food to be cooked was placed. The bread pans were made of heavy pottery and their system involved heating empty containers in the stove until they were very hot. At this point the pan was removed from the oven and the dough was placed in them. Heat stored in the heavy pottery was sufficient to bake the dough and make it into bread. Egyptians also cooked food over an open charcoal fire. As time passed, merchants of Egypt expanded their trading and whenever they wanted, 5000 years of Egyptian progress was soon transplanted.

The custom of food, food preparation drink and dining service was included in the knowledge passed on by the Egyptians approximately 3000 years ago; the center of civilization began shifting away from Egypt and came to rest in Greece. It is in this time and place that the food service industry attained its full measure of professionalism and respect. In early Greek history preparation of food was simple. The household kept two women slaves, to grind and bake bread and cook other dishes. Their talents were limited and whenever the occasion demanded the host went into the kitchen to prepare food. Later on men were added to the kitchen staff and the man known as **Magiero** took the task of preparing bread. The Magiero was a slave but an unusual one for his master

treated him with respect befitting a skilled artisan. In the beginning his duty was of making bread but later it included the overall charge of entire kitchen and other kitchen slaves and all the aspects of food preparation were under his control. He was given assistance and public acclaim for the feast he prepared. There was a special law, which permitted him with exclusive rights to prepare new dish and sell it to public.

The Magieros were the first to make cooking a respectable profession and set standards for its practice. An apprentice system was set up. The novice had to work for 2 years under an established Magiero. He had to study from many books the culinary art. The profession grew to one of the greatest respect and the Magieros in Greece became free to continue to practice of the culinary profession. They were available to work for pay and some held steady jobs. Most of them worked only when banquets worthy of their attention was being held. The people of ancient Greece loved to eat and developed many customs relating to food and its place in daily life. Three meals were eaten in a day, one after getting up, like bread dipped in wine, one in the afternoon which was a simple meal varying from household to household and the principle meal in the evening consisting of two courses, meat with accompaniments and dessert. Kitchens in Greece were well supplied with pork, beef, goat, which was prepared by boiling or roasting. Sausages in different sizes and shapes were popular. In the beginning the Greeks didn't eat in bowl and dish but later on they took to it. Sardines with their favourite vegetables like cabbage, lettuce, beans and lentils were eaten regularly, and for dessert, fruit like figs, pomegranates, apples, pears, and grapes were very common. Athens was famous for its parties. The Greeks liked to socialize and loved to eat in company and at any given opportunity banquet or party was given. They dined in a semi reclined position and used the right arm and hand for eating. Food was eaten from baskets but eventually two sizes of china plates were developed. The meat corner was lined by the only man with a knife in the dining room and it was his duty to cut everybody's requirement of meat portions into bites sized pieces. Forks were not used but everybody had a spoon like implement to handle gravy and soup. Main dishes were eaten directly from serving dishes; everyone ate rapidly to ensure that they would get the most of their share as possible. The decline of Greece and ultimate defeat came about in 146 BC when they were conquered by Rome. Meanwhile the Greek merchants and the Greek soldiers spread their customs wherever they went. The merchants were even able to establish colonies in the name of Greece in the southern part of Italy and there was a continuous exchange of information. Thus the discoveries and refinement of Egypt and Greece were soon transplanted to Italy.

**The Roman Empire:** The condition of the Greek colonies in south Italy did not change, people continued their more primitive existence, providing food for themselves, providing shelter and protecting themselves from attack. They realized that defense was an important consideration and so they built villages on hills. The collection of these villages grew to be a great heart of an Empire called Rome by thousands. Soon Romans built up strong army to defend themselves and any attack of aggression was crushed heavily. Later they carried out invasions and the lands owned by the soldiers were annexed and added to the Empire, thus expanding the Roman Empire.

The average Roman citizen was not rich, they were shepherds in farms. Meals were of fruits, vegetable, porridge, and wine. They ate pork and meat. The number of

meals varied depending upon religious customs, but the pleasure of food and dining played an important role in the life of Roman elite's who were very rich and could afford the very best from anywhere in the world. They had staffs able to produce the most exquisite of dishes. These people were quick to sample foods from other places and were in fact so intent on the discovery of new tastes and sensations that they even set expeditions to far corners of the world in search of such things. They found some of the culinary inspiration in Asia Minor they came back with appetite for oriental food. It was then that meals began to demand more preparation and expense. The Romans captured the Greek colonies in the south and were very impressed with food prepared by Magieros who they sent to Rome as slaves to work as cooks in the houses of wealthy citizens. And when Rome captured Greece, some more Magieros were sent back to Rome. The captured Magieros accepted their fate and went about teaching the Roman about the artistry of food. In due time they received great acclaim for accomplishments and some were freed by grateful masters. It was during this year that the duties of the kitchen were 1st separated and departmentalized and in 25 AD man called Apicus wrote the first cook book. The Romans were great meat eaters and birds were highly popular, they loved to use all sorts of condiments, they had no cane or beet sugar so they used grapes syrup and honey. To meet the new demands made by changed tastes Rome developed a sophisticated system of food production, importing and marketing. So they set up a centralized market where all kinds of foodstuffs were sold. The Roman Empire, top heavy with power and luxury and corruption was deteriorating and by a 76 AD it collapsed.

All over Europe darkness fell, people returned to a life in small rural villages and led a simple life eating simple food. The 1400 years period of decline and recovery is known as Dark or Medieval period. The Dark Age was a period of decline and subsequent recovery for the fortunes of food and dining customs. Like everything else they sank to a very low point before recovery got underway. The culinary achievements of Greece and Rome were stored in written words to be discovered later. The basic social system at this time was Feudalism where someone who declared themselves as kings and this in turn to be subdivided and given to lords who in return paid tax and loyalty to the king owned large areas. The lords' in turn again assigned lands to tenants or serfs, who tilled the land, grew crops, raised animals. Half or more of the produce went to the Lord who in turn gave some to the king and kept some for himself. This way the lords and kings lived comfortably at the costs of the serfs. This Feudalism produced 2 levels in society with each one with distinctive habits. The serfs existed on a diet of salt, pork, black beans, turnips and cabbage. While the Lords and kings stuffed themselves with a minimum of 30 dishes a meal.

**Life in the Castle:** The great hall was the only place where there was a fire lit. It was in this place that every member of the castle took the meals, which at times numbered well over a thousand. The room held tables and everyone sat on benches with no backs, there was no tablecloth used during most of the Dark ages. Besides the crowd having their meals there were number of animals and at times the knights also came in with mounts. Since there was no organization of meal service everybody stood around talking and arguing till his or her turn came to eat.

The courses were heralded by trumpeters and transported to tables in grand style. Food ranged from plain to exotic. There was plenty of pork, game, poultry, beans and peas served. But other vegetables and fruits were thought to be food fit for pigs. Milk, butter, cheese and honey were available and widely used the refined dining customs of Greece and Rome was long forgotten in this period and even the royalty ate in a crude form. The use of plates was discontinued and everyone ate from a round piece of bread called *trencher*. The only table utensil available was a small spoon like implement but still people preferred to eat with fingers. Food served at that time could be spooned or cut into bite size pieces stuck together with a gravy or sauce. Trade and travel resulting from the crusades gradually broke the grip of Dark Ages and by 1500 things began to move forward again. Trade with the orient was resumed and introduction of ideas from far places did a lot to alter eating habits in Europe. The most popular new item was spice, which was expensive but popular. Cinnamon, ginger saffron, cloves, mace, kesar were used and for the first time, food was pleasure to the palate. Sugar and almonds were re-introduced. Fruit and vegetables regained popularity and respect. Food became tastier between the years 1000 AD and 1400 AD but dining practices still remained crude. The great hall still served as the main dining hall in the castles and was dirty and confused as always with the discovery of chimney the fireplace made it possible to heat the other rooms in the castle and the king started dining in private in comfort and quiet. The chimney also made it possible to bring the cooking process indoors which was otherwise done outdoors on open fire. This improved the food quality.

During the late 1400 and early 1500 diners at the royal table were kept amused by an entirely new dimension of culinary artistry. Cooks were instructed to produce food, which was both tasty and entertaining. They devised many dishes to fit this meal which was truly unique. In one occasion they produced a huge pastry which was wheeled into the dining room and when cut open revealed a hollow interior containing 28 musicians. Many such creations were produced when 16th century Europe was on its way to recovery, feudalism withered and died and the old kingdoms gradually evolved as nations. Columbus discovered America. Food became favorite subject and people carried recipes and other knowledge of food with them when they traveled from one place to another. The diet was vastly improved e.g. tomatoes were grown throughout Europe were never eaten as they were said to be filled with poison. In 1544 a young man who was forsaken by his lover, decided to commit suicide, ate tomatoes, but didn't die. It was delicious. He named it apple of gold. Word of his discovery spread and before long Europe was enjoying tomatoes. Cucumber was first grown in Europe in 1577 after merchants returned from Mediterranean with seeds. Pickles were first made and became popular. Tea and coffee were discovered and changed breakfast from a meal with wine and beer to sugar. In the 16th century people discovered joy of a beefsteak as cattle was plenty. Later due to shortage of all meat the church declared a fish day on Friday and Saturday. 17th century brought improvement to food and table service, most important being invention of table fork. It is significant as it altered form of food that could be served. It in turn affected kitchen production technique and brought a new professionalism to the industry. The old days of sticky mess were gone forever and development in culinary artistry was wide open. One of the culinary arts most widely explored during the 17th century was that of the pastry cook. All of the culinary arts were popular during this time and cooks were treated with respect and were well paid.



Another important development of this period was the re-introduction of the dining plate. In the 18th century Europeans were frequently at war. Emperor Napoleon found himself in need of an efficient way to feed his armies in the battlefield. So he reasoned that there should be away to preserve food to be carried by his troops wherever they went instead of forgoing for it. He offered a reward to anyone who could devise such a system. After many years of experimentation a man Nicholas devised the system called canning, where food was packed in sterilized jars and stopped with a cork.

### **THE FRENCH CONTRIBUTION**

Le Livre fort excellent de cuisine (the very excellent cookery book) was published in 1540 written by P. Pinoux. Catherine of Medicis in 1575 brought in France, the Arts (renaissance) among which were the arts of Cookery. The fork for eating was put on service by Henry III. After 1600, from Louis VIII, menus became more balanced, more vegetables and less meats (XVII th Century). At this period, champagne was created by a monk, Dom Perignon. Table service has now silver and crystal. Potato is introduced by Parmentier and beetroot used to make sugar. C. de Lavarenne Cook of the Marquis D'uxelles writes "The French Cook" in 1653. S. S. Robert writes 15 years of progress in French Cookery in 1680. A sauce still has his name. Vatel is the first victim of Cookery (1671). He was the head cook of the Prince – brother of the king, and committed suicide when the fish delivery for the king's banquet did not arrive in time. Louis XIV headwaiter was Marquis de Noritel also known as Louis de Béchamel, creator of this sauce. The Duke of Richelien, winner of Mahon battle, gave its name to a sauce of his invention MAHONNAISE or Mayonnaise. The Duke of Mirepoix for its quail recipes.

Chocolate was introduced at this date as a beverage as well as coffee and tea. An Italian Procopio Del Collelli opened the first coffee bar in Paris in 1675, still exists today. Tea was introduced during Renaissance but only used as a drug. The first gastronomic critic for restaurants was called Grimod de la Reyniere (Almanach des gourmande), who wrote the history of cookery and service from 1789 till 1814. He also wrote the first Restaurant guide for Parisians. The first take away shops opened at this period. (Corcellet – Potel and Chabot) who also started outdoor catering. Brillat Savarin writes the Taste Physiology and Marie Antonis Careme 1784-1833 his famous Cookery books. The beginning of the XIX Century as one can see marks the era of Modern Cookery. The victory of Marengo in Italy by Napoleon Bonaparte gave its name to this famous Chicken Fricassee made out of the Commodities available on the evening of the battle. Chicken, onions, garlic, tomatoes, eggs, and fresh water prawns (Ecrevisses).

Alexander Dumas, also known for "the three Musketeers" wrote his grand Dictionary of cookery. Many famous names appear like Auguste Escoffier, the founder of Modern Cookery. Foyot, Maire, creator of the famous Crepe Suzette. La Tour D'argent, Vourour, on the 1st day of the 20th century, a banquet of 22,000 was served (125 tables of 10m each) by 2000 waiters. Later on banquets of 30,000 and 40,000 were organized. The period is between the 2nd world wars, saw the creation of many famous restaurants in particular Point in Vienne (France) as well as the publication of Michelin guide, classifying all the restaurants in France for the use of road travellers. Nouvelle cuisine began in the 70's with Paul Bocuse.

The next great step in the development of food service industry occurred when a few colonists from Europe landed on the Eastern coast of North America. These people brought many things to begin life in the new land. But none were more important than their understanding and appreciation of food. In later years, immigrants from all over the world brought their own tastes and preparation skills. The result is a melting pot where thousands of special tastes and techniques have been mixed and interwoven to form the great concept of food. The food service industry is a product of development reaching back to the dawn of civilization. Today it is a vibrant industry.

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## 1.4 MODERN HAUTE KITCHEN

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Quantity cookery has existed for thousands of years, as long as there have been large groups of people to feed, such as armies. Modern food service began at the time of the French revolution in 1793. Before this time, the great chefs were employed in the houses of the French nobility. With the revolution and the end of the monarchy, many chefs suddenly opened restaurants in and around Paris to support themselves.

The great chef of this time was Marie-Antoine Carême (1784-1833), whose career spanned the first 30 years of the 19th century. Carême is credited as the founder of classical cuisine. As young man he learned all the branches of cooking, and he dedicated his career to refining and organizing culinary techniques. His many books contain the first really systematic account of cooking principles, recipes and menu making. As a chef to kings, head of state, and wealthy patrons, Carême became famous as the creator of elaborate, elegant display pieces, the ancestors of our modern wedding cakes, sugar sculptures, and ice and tallow carvings. But it was Carême's practical and theoretical work as an author and chef that was responsible, to a large extent, for bringing cooking out of the middle ages and into the modern period.

### ESCOFFIER

Georges Auguste Escoffier (1847-1935) was the great chef of this century and is revered by chefs and gourmets as the "Father of Modern Cookery". His two main contributions were the simplification of classical cuisine and the classical menu and the reorganization of the kitchen. It is hard to believe that Escoffier's elaborate multi-course banquets are a simplification of anything. But in the typical banquet menu of the eighteenth century, each course consisted of as many as 20 separate dishes – or more! – Mostly a variety of meats and poultry all placed on the table at once. Guests help themselves to the few dishes they could reach. Carême began the reform, but Escoffier brought the menu into the twentieth century. Escoffier rejected what he called the "general confusion" of the old menus in which sheer quantity seemed to be the most important factor. Instead he called

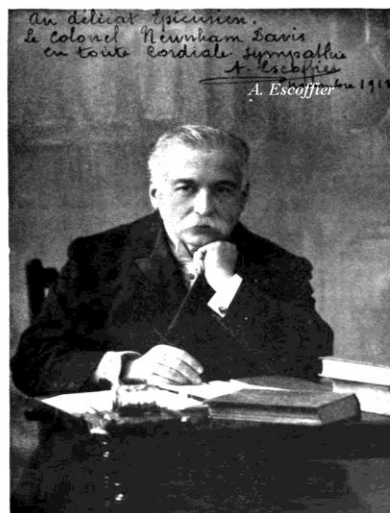


Fig. 1A

for order and diversity and emphasized the careful selection of one another harmoniously and that would delight the taste with their delicacy and simplicity. (Fig.1A)

Escoffier's books and recipes are still important reference works for professional chefs. The basic cooking methods and preparations we study today are based on Escoffier's work. Escoffier's second major achievement, the reorganization of the kitchen, resulted in a streamlined workplace that was better suited for turning out the simplified dishes and menus that he instituted. The system he established is still in use today, especially in some large hotels and full-service restaurants.

**Modern developments:** Today's kitchens look much different from those of Escoffier's day, even though our basic cooking principles are the same. Also, the dishes we eat have gradually changed due to the innovations and creativity of modern chefs. The process of simplification and refinement, to which Carême and Escoffier made monumental contributions, is still going on, adapting classical cooking to modern conditions and tastes.

**Development of New Equipment:** We take for granted such basic equipment as gas and electric ranges and ovens and electric refrigerators. But even these essential tools did not exist until fairly recently. The easily controlled heat of modern cooking equipment, as well as motorized food cutters, mixers, and other processing equipment, has greatly simplified food production.

Research and technology continue to produce sophisticated tools for the kitchen. Some of these products, such as tilting skillets and steam-jacketed kettles, can do many jobs and are popular in many kitchens. Others can do specialized tasks rapidly and efficiently, but their usefulness depends on volume, because they are designed to do only a few jobs. Modern equipments have enabled many food service operations to change their production methods. With sophisticated cooling, freezing, and heating equipment, it is possible to do some preparation farther in advance and in large quantities. Some large multiunit operations prepare food for all their units in one large central commissary. The food is prepared in quantity, packaged, and chilled or frozen, and then heated or cooked to order in the individual units.

**Development and Availability of New Food Products:** Modern refrigeration and rapid changes in eating habits has changed the lifestyle of the people over the years. For the first time, fresh foods of all kinds – meats, fish, vegetables, and fruits – became available all year. Exotic delicacies can now be shipped from anywhere in the world and arrive fresh and in peak condition. The development of preservation techniques, not just refrigeration but also freeze drying, vacuum packing, and irradiation, increased the availability of most foods and has also made affordable some foods that were once rare and expensive. Techniques of food preservation also have had another effect. It has now become possible to do some or most of the preparation and processing of foods before shipping rather than in the food service operation itself. Thus, convenience foods have accounted for an increasing share of the total food market. Some professional cooks think of new convenience food products and new equipment as a threat to their own positions. They fear that these products will eliminate the need for skilled chefs, because everything

will be prepared or will be done by machine. However, it still requires skill and knowledge to handle convenience products properly. The quality of the product as served depends on how well the cook handles it. Furthermore, many new food products and new types of equipment are intended to do work that takes little or no skill, such as peeling potatoes or puréeing vegetables. Convenience foods and advanced equipment free cooks from some of the drudgery so that they have more time to spend on those jobs that require skill and experience.

**Sanitary and nutritional awareness:** The development of the sciences of microbiology and nutrition had a great impact on food service. One hundred years ago there was little understanding of the causes of food poisoning and food spoilage. Food handling practices have come a long way since Escoffier's day. There was also little knowledge of nutritional principles in the last century. Today, nutrition is an important part of a cook's training. Customers are also more knowledgeable, and the demand for healthful, well-balanced menus is growing.

**Modern cooking styles:** All these developments have helped change cooking styles, menus, and heating habits. The evolution of cuisine that has been going on for hundreds of years still continues. Changes occur not only because of our reactions to culinary traditions. Two opposing forces can be seen at work throughout the history of cooking. One is the urge to simplify, to eliminate complexity and ornamentation, and instead to emphasize the plain, natural tastes of basic, fresh ingredients. The other is the urge to invent, to highlight the creativity of the chef, with an accent on fancier, more complicated presentations and procedures. Both these forces are valid and healthy; they continually refresh and renew the art of cooking.

Recently history provides an example of these trends. Reacting to what they saw as heavy, stodgy, overly complicated classical cuisine, a number of French chefs in the late 1960s and early 1970s become famous for a style called nouvelle cuisine ("new cooking"). They rejected many traditional principles, such as a dependence on flour to thicken sauces, and instead urged simpler, more natural flavours and preparations, with lighter sauces and seasonings and shorter cooking times. Very quickly, however, this new, "simpler" style became extravagant and complicated, famous for strange combinations of foods and fussy, ornate arrangements and designs.

By the 1980s, many people were already saying that nouvelle cuisine was dead. It isn't dead, of course, any more than the cuisine of Escoffier is dead. The best achievements of nouvelle cuisine have taken a permanent place in the classical tradition. Meanwhile, many of the excesses have already been forgotten. It is probably fair to say that most of the best new ideas and the lasting accomplishments have been those of classically trained chefs with a solid grounding in the basics.

Nowadays the traditional dishes and regional specialties are the product of cooking traditions brought over by immigrant settlers, combined with the indigenous ingredients of a bountiful land. For many years, critics often argued that most menus offered the same monotonous, mediocre food. Recently, by contrast, cooking has become fashionable, and almost any local specialty is declared "classic". The fact is, however, that in any country one finds both good and bad food. It takes a skilled cook with a

knowledge of the basics to prepare exceptional food, whether it is American, classical French, Chinese, Indian or any other.

The growth of food service holds great promise for new cooks and chefs. Technology will continue to make rapid changes in our industry, and men and women are needed who can adapt to these changes and respond to new challenges. Although automation and convenience foods will no doubt grow in importance, there will always be a need for imaginative chefs who can create new dishes and develop new techniques and styles and for skilled cooks who can apply both old and new techniques to produce high-quality foods in all kinds of facilities, from restaurants and hotels to schools and hospitals.

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## 1.5 NOUVELLE CUISINE

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Nouvelle cuisine began in the early 70's in France when 2 gastronomic critics/reviewers named H. Gault and C. Millau decided they were fed up to eat the same classical food every day. They spoke of changes to a handful of leading French chefs and those decided to use their imagination to produce something new. The chefs were named P and J. Troisgros (2 brothers) M. Guerard, A. Chapel, R. Verge and of course Paul Bocuse. (Fig.1B)

Their first action on food was:

- Smaller portions but more dishes on the menu.
- Served on plate so that service staff did not destroy presentation effect when handling with service spoon-fork.
- Sauces without flour.
- Shorter cooking times.
- Follow seasonal changes in foodstuffs and buy from the best suppliers.
- Presenting unusual combinations.



Fig.1B

The revolution started with original salads, vegetable terrines fish cooked pink on the bone and very high prices but the movement held its course and almost 20 years later, not one famous restaurant serves classical food. Gault and Milan monthly publication increased its production from 10,000 copies to 20 lakhs copies per month.

The latest tendency of Nouvelle cuisine is to come back to the origin and serve less dishes but of the highest quality. Amazing but true, Paul Bocuse latest best seller is spit roasted chicken, and chapel's one is veal chop in its juices.

Nouvelle cuisine has been influenced by Chinese cuisine- crisp vegetable, stir-frying and steaming, by Indian spices: ginger, coriander, jeera, saffron and by technology- Microwave ovens, high pressure steamer and vacuum cooking.

This style of cooking was developed by Paul Bocuse who researched the subject thoroughly both in theory and practice before introducing it to the catering world.

Through his work Bocuse has reminded us of the fundamental principles of cookery and the full potential of the commodities and foods used. The aim is to serve food with its natural taste undisguised by either the cooking process of accompanying sauces or garnishes. Food should always be fresh, the daily menu being composed of dishes made of commodities purchased on the same day rather than the menu dictating what should be bought. One result of this approach is that many establishments now offer customers a “menu surprise” composed of food in season and at the height of their perfection. These dishes, often prepared in an original way, may not appear on the printed menu since their availability may be unpredictable.

Under this approach, food is very lightly cooked so that as little as possible of the nutritional value is allowed to leach out. The guideline is just to cook or, in some instances, undercook foods so that their individual flavours textures and characteristics may be enjoyed to the fullest.

**General principles of Nouvelle Cuisine:** There currently some debate as to what is actually meant by nouvelle cuisine. It has been referred to as “Classique Nouveau” implying that it is not new but a development of the classical French style. It is not the author’s intention to enter in to such debate but to present the current trends and developments to the student so that he may seek out further information and make up his own mind as to what the concept implies. The underlying principles associated with nouvelle cuisine may be identified as follows. It must, however, be remembered that there many interpretations of this style and that the repertoire is continually developing. With the exception of basic stocks most other foods are cooked to the customer’s order. The basic sauces béchamel, veloute, and demi-glace play no part in any dish. Dishes based on or featuring these or indeed any roux based thickened sauces, gravies, soups, stews, or braised items, are completely avoided.

Convenience foods are also avoided. All fish, meats, poultry, game, vegetables and as on should be purchased fresh each day. The foods, their texture, and accompanying sauces should be extremely light and free from any trace of grease, with a natural blend of colours, textures, and flavours. Vegetables are only lightly cooked they should be crisp, nutty, and full of natural flavour. Presentations are more important than display when serving. The chef himself should arrange the food on the plate just as he wishes the customers to view it rather than a waiter serve it from the silver dish. The plate itself is considered part of the dish so care should be taken to select those of goods quality with suitable shapes and patterns that will complement the food being served. The actual arrangement of the food should give full regard to the shapes of the plate and the contrasting shapes, colours, and textures of the items of food to be placed on it to achieved maximum visual appeal. The sizes of the individual portions are smaller than is usual with more traditional style of cooking. Since every morsel of food should be cooked to perfection’s it is hoped there should be no waste.

Indian chefs new practice Nouvelle cuisine using local products. In Bombay –RENDEZ VOUS and MENAGE A TROIS -(TAJ), LEELA PENTA (Waterfall café) –OBEROI Rotisserie. In Delhi - TAJ PALACE (orient express), HYATT (Valentino). In conclusive, we can say that haute cuisine has lost its throne to the profit of Nouvelle cuisine which

has reached standards of quality certainly as high (if not more) as the ageing Escoffier's Haute cuisine.

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## 1.6 INDIAN REGIONAL CUISINE

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Although Indian cuisine is highly regionally specific, there are certain common threads that unite the different culinary practices. Indian cuisine throughout the nation is highly dependent on curries, which are gravy-like sauce or stew-like dishes with meat, vegetables, or cheese, although the particular spice mixtures, degree of liquidity, and ingredients are determined by regional preference. Indian cuisine in general is also very dependent on rice, although Southern Indian regions use rice more heavily than other areas. All regional cuisines are reliant on “pulses” or legumes. Indian cuisine uses perhaps a greater variety of pulses than any other world cuisine: red lentils (masoor), Bengal gram (chana), pigeon peas or yellow gram (toor), black gram (urad), and green gram (mung) are used whole, split, or ground into flour in a diverse number of Indian dishes. Dal, or split or whole legumes, add creaminess to dishes that don't use dairy, and protein to vegetarian diets.

Perhaps the most defining characteristic of Indian cuisine is its diverse use of spices. Indian spice mixes often use upwards of five different spices, sometimes combining 10 or more. Chili pepper, black mustard seed, cumin, turmeric, fenugreek, ginger, garlic, cardamom, cloves, coriander, cinnamon, nutmeg, saffron, rose petal essence, and asafetida powder ( a spice that has an overly strong scent when raw but imparts a delightful flavor akin to sautéed onions and garlic when cooked) are all used frequently in various combinations. Garam masala is a popular spice mix, cardamom, cinnamon, and clove, with the additional spices varying according to region and personal recipe. Mint, coriander, and fenugreek leaves offer their pungent, herby flavors to dishes throughout India.

**Outside Influences: *Conquest and Trade:*** The cultural impact of trade is evident in the India's cuisine, with specific regions and dishes bearing the mark of foreign influence. India's spices were highly coveted by Arab and European traders; in exchange, India received many goods that greatly influenced its culinary tradition. Portuguese traders brought New World imports like tomatoes, potatoes, and chilies, which have become deeply integrated into Indian dishes. Arab traders brought coffee and asafetida powder. India's periods of conquest have also greatly shaped the development of its cuisines. Mughal conquerors, who occupied India between the early 1500s and late 1600s, infused India's culinary tradition with Persian flavors and practices. The effect is notable in the use of cream and butter in sauces, the presence of meat and nuts in dishes, and specifically in dishes like biryanis, samosas, and pulaos, which draw heavily on Persian cuisine.

Although British control of India introduced soup and tea to the country, it had little impact on its cuisine. The colonial absorption of Indian cuisine into British culture, however, has deeply affected the translation of Indian food abroad. Chicken Tikka Masala, a popular dish on many Indian menus, is in fact an Anglo-Indian creation and is commonly known as “Britain's true national dish.” Even Western concepts of Indian

“curry”-the term is applied to a multitude of gravy and stew-like dishes-are derived from British interpretation of Indian cuisine. Curry powder is also a British creation: a blend of Indian spices that were originally paired together by colonial cooks.

**Diverse Population, Diverse Gastronomy:** India’s population is highly diverse, with cultural identities heavily influenced by religious and regional particularities. Ayurvedic teachings, emphasizing equilibrium between mind, body, and spirit, have exerted an influence over Indian cuisine in general, dictating ingredient pairings and cooking practices. While this philosophy is a common influence throughout Indian cuisine, the ways in which Ayurvedic food rules are applied differ according to religion and regional culture. Approximately one-third of India’s population is vegetarian, dictated by their Hindu, Jain, or Buddhist faiths. Consequently, a significant portion of India’s dishes throughout the country are without meat. Additionally, religious beliefs affect other dietary restrictions that shape India’s cuisine: Hindu followers abstain from beef, because cattle are sacred in this faith, while Muslims believe pork to be unclean and never eat it. Depending on the dominant religious beliefs of a region, the cuisine in a particular area may omit certain ingredients to comply with religious law. The State of India is divided into four regions depending upon the agricultural growth, climate, fooding habits, culture and customs. They are: (Fig.1C)

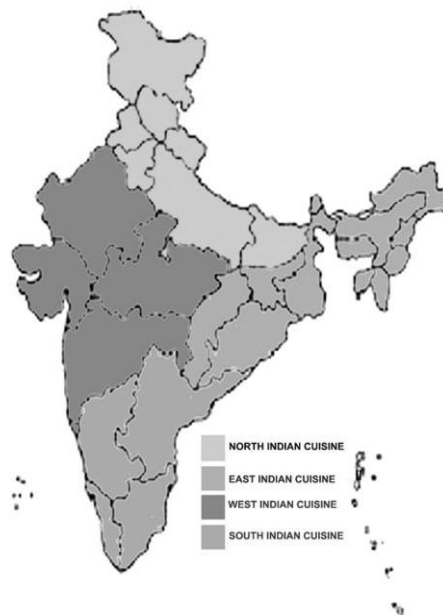


Fig. 1C Indian cuisine regions

**Northern Indian Cuisine:** Perhaps the most prevalent culinary style found outside of India, Northern Indian cuisine reflects a strong Mughal influence. It is characterized by a high use of dairy: milk, paneer (an Indian mild cheese), ghee (clarified butter), and yogurt are all used regularly in Northern dishes. Samosas, fried pastries stuffed with potatoes and occasionally meat, are a distinctive Northern snack. Clay ovens known as tandoors are popular in the North, giving dishes like Tandoori Chicken and Naan bread their distinctive charcoal flavor. A significant number of Northern dishes make regular appearances on Indian menus. Dal or Paneer Makhani are popular vegetarian dishes, consisting of dal or paneer cooked in a creamy sauce of tomatoes, onions, mango powder, and garam masala. Saag Paneer and Palak Paneer are two similar dishes made with spinach, cream, and paneer, differing slightly in consistency and spices. Korma, another menu staple from Northern India, is a creamy curry of coconut milk or yogurt, cumin, coriander, and small amounts of cashews or almonds. It can be served with different meats, usually chicken or lamb, but sometimes beef, as well as with paneer for a vegetarian dish.

**Western Indian Cuisine:** Western Indian cuisine is distinguished by the geographic and historical particulars of its three main regions: Maharashtra, Gujarat, and Goa.



Maharashtra's coastal location is responsible for its fish and coconut milk-dominant cuisine. Gujarati cuisine is mostly vegetarian and has an underlying sweetness to many of its dishes due to Chinese influence. Since the dry climate of this region produces smaller vegetables, this region is well known for its chutneys, which are popular Indian condiments that use cooked, fresh, or pickled vegetables and fruits with sweet, sour, or spicy flavors. Goa acted as a major trade port and colony for Portugal, resulting in a distinctive and unique blend of Indian and Portuguese culinary elements. Goan cuisine uses pork and beef with greater frequency than other regional cuisines in India. Vinegar is also a characteristic ingredient of Goan cuisine, another result of Portuguese influence. The prevalence of coconut milk, coconut paste, and fish in Goan cuisine results from its coastal location. Vindaloo is a traditional Goan dish that is an Indian restaurant mainstay, its name deriving from Vinho de Alho, a Portuguese marinade consisting primarily of garlic, wine, vinegar, and chilies.

**Eastern Indian Cuisine:** Eastern Indian cuisine is primarily known for its desserts. These desserts are not only favored by other regions in India, but are frequently found at Indian restaurants, their light sweetness making an excellent finale to a meal. Rasgulla is a popular sweet treat consisting of semolina and cheese curd (chenna) balls that are boiled in a light sugar syrup. Eastern dishes favor mustard seeds, poppy seeds, and mustard oil, giving dishes a light pungency. Rice and fish also feature prominently in Eastern cuisine. Overall, Eastern dishes are more lightly spiced than those from other regions.

**Southern Indian Cuisine:** Southern Indian cuisine is not typically found on many Indian restaurant menus and differs greatly from other regions. Its "curries" contrast differently in their textures and can typically be categorized according to the drier consistency, or those favoring a more soupy or stew-like presentation. Poriyals, dry curries consisting of a variety of vegetables and spices, accompany rice dishes. Sambars, rasams, and kootus, three common stew-like dishes, each differ in their primary ingredients and degrees of liquidity. Sambars are essentially tamarind flavored pea and vegetable stews that are more watery than curries from other regions, but are thicker than rasams. Rasams are more similar to soups in their consistency, and are composed primarily of tomato, tamarind, and a myriad of spices. Kootus are more similar to curries found in other regions, but, rather than being creamy like the dairy-based curries of the North, kootus get their consistency from boiled lentils. Aside from curry-style dishes, Southern Indian cuisine is known for its tasty fried or griddle-cooked snacks. Dosas consist of a large crepe-like rice pancake that is usually filled with vegetables, chutneys, or masala curries. Utthapams are similar to dosas, but are thicker with the "filling" sprinkled on top like a pizza. Idlis and vadas are fried delicacies similar to savory doughnuts that are served as accompaniments to sambars and rasams. Apart from restaurants that specifically serve Southern Indian cuisine, the only South Indian food that is frequently found in Indian restaurants are pappadams, a fried crispy rice cracker usually spiced with black peppercorns.

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### CHECK YOUR PROGRESS EXERCISE-1

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Q.1 What are the foreign influences that transformed the Indian cookery?

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Q.2. Where is Nouvelle cuisine practiced in India?

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Q.3 Name 5 world renowned personalities who were pioneer in gastronomy?

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## 1.7 POPULAR INTERNATIONAL CUISINE

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Below mentioned are the most popular cuisines served all over the world. They are so popular that mere dishes of these countries are found from deluxe to road side fast food outlets. The unique taste, texture and flavour of the dishes are mouthwatering. Here we are going to learn the basics of French, Italian, Chinese and Indian cuisine.

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### 1.7.1 FRENCH CUISINE

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In France, cuisine is not simply a source of pleasure but a multifaceted discipline. With a focus on tradition, technique and mastery of style, French cuisine is arguably the most aesthetic cuisine in the world. The development of French cuisine may be attributed to the fact that France has historically had a gastronomique capital —Paris. Culinary resources are concentrated there—the best ingredients and the most sensitive palates were all to be found at one place.

France is situated between 43°N and 51°N latitudes and between 5°W and 9°E longitude. The hexagon shaped mainland of France is located in western Europe and is bordered by the English Channel on the north west, Belgium and Luxembourg on the north east, Germany, Switzerland and Italy to the east, the Mediterranean sea to the south east, Spain and Andorra on the south west and the Bay of Biscay and the Atlantic ocean to the west. The Pyrenees mountain range divides France from Spain.

France has an area of 547000 km<sup>2</sup>, the terrain to the north and west is flat with rolling hills, while the south and east are quite rugged and mountainous. The climate is mild winters and summers in the west, cool winters and hot summers inland, tough winters in the mountains and mild winters and hot summers along the Mediterranean in the south.

About 57% of the land in France is dedicated to agriculture and the population of France is approximately 61 million.

**Historical and cultural background:** Throughout its history France has been invaded by explorers from many foreign countries. In certain areas of the country Celtic, British, Basque, Spanish, Italians, Greek and Arab influences are evident. The Celtic Gaul introduced farming to this area and also developed Charcuterie for which France is famous even today. The Romans who took over introduced cheese making and the Moors introduced goat rearing and spices. Arab influence is evident in the use of almonds and rice. With the marriage of Catherine de Medici to Henry II the foundations for modern French cuisine were established. Marie Antonio Carême (1784-1833) the great Chef who organized and detailed dishes according to courses laid the foundation for Grande Cuisine. It was further refined by Chef Georges-Aguste Escoffier whose approach was based on simplicity and called it Cuisine Classique. The next major shift in French cuisine was initiated by Chef Fernand Point (1897-1955) who further simplified the menu and laid the ground work for Nouvelle Cuisine.

France may be divided into four culinary regions—the North West, North East, South West and South East. There are in all 22 provinces, each province has its own culinary specialties, impacted by history, terrain and climate.

**The North West region:** The North West region includes the provinces of Brittany, Basse-Normandy, haute Normandy, Pays de la Loire and the Loire Valley. This area has a long coastline and maritime climate- cool summers, warm winters and heavy rain. Proximity to the ocean results in a cuisine heavily influenced by sea food. Clams, lobsters, Dungeness crabs, oysters, skate, mackerel and Dover sole are all relished. Wild game including boar, rabbit, duck and pheasant, along with domestic goat and lamb are all popular. Normandy is renowned for cow's milk cheese - Camembert and superior butter which is utilized heavily in local cuisine. Fruits and vegetable of this region include pears, plums, apples, potatoes, artichokes, endive and pumpkins. Wheat is the preferred grain and walnuts the favourite nut.

#### **The North East region**

The North East region of France includes Nord Pays de Calais, Picardy, Champagne, Alsace, Lorraine and Franche-Comte. This region's cuisine is influenced by its neighboring nations – Germany, Switzerland and Belgium. Thus foods traditionally associated with Germanic cuisine such as sauerkraut and sausages are popular as are waffles and beets, items of Flemish origin. Pork, wild game, foie gras, freshwater fish, escargots (snails) and frogs are commonly utilized. The products of this region are wheat, barley, endive, beets, potatoes, cabbage, wild mushrooms, truffles, plums, apples, cherries, grapes, asparagus and cheese. Wheat is used to make spaetzle and egg noodles.

#### **The South East region**

The southeast region of France consists of Burgundy, Auvergne, Limousine, Rhône Alps, Côte d'Azur and Corsica and is the home to the city of Lyon the culinary capital of France. Beef, pork, lamb, duck and rabbit are all common as are cheeses

derived from cow's, sheep's and goat's milk. Artichokes, eggplants, tomatoes, garlic, olives, herbs, apricots, cherries, plums and figs flourish in the cool Mediterranean climate. Common fish include anchovies, sardines, red mullets and monkfish. Specialties of this region include Dijon mustard, Le Puv lentils, bouillabaisse, ratatouille and tapenade.

### **The South West region**

The provinces of Midi-Pyrenees, Languedoc-Roussillon, Aquitaine and Poitou-Charentes make up the southwest region of France. This area borders Spain and is heavily influenced by Spanish cuisine and the Arab moors conquerors from Africa. Seafood is popular including monkfish, eel, tuna, oysters, cod and mussels. Poultry, walnuts, chestnuts, porcini and chanterelles mushrooms are harvested. The Moors introduced exotic spices such as pepper, cumin, anise, ginger, cinnamon and caraway. Specialties are fish soup with peppers and onion and Jambon de Bayonne. The staples are wheat, barley and corn and like the Spanish use almond paste for thickening sauces.

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## **1.7.2 ITALIAN CUISINE**

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Italy is located in southern Europe and comprises the long, boot-shaped Italian Peninsula, the land between the peninsula and the Alps, and a number of islands including Sicily and Sardinia (Corsica, although belonging to the Italian geographical region, has been a part of France since 1769). Its total area is 301,230 square kilometers (116,310 sq mi), of which 294,020 km<sup>2</sup> (113,520 sq mi) is land and 7,210 km<sup>2</sup> is water (2,784 sq mi). It lies between latitudes 35° and 48° N, and longitudes 6° and 19° E. Italy borders with Switzerland (740 km/460 mi), France (488 km/303 mi), Austria (430 km/270 mi) and Slovenia (232 km/144 mi). San Marino (39 km/24 mi) and Vatican City (0.44 km/0.27 mi) are both entirely surrounded by Italy.

For culinary purposes, the country can be loosely divided into the South, Central and North. Northern Italy is bordered by France, Switzerland, Austria and Slovenia. Central and Southern Italy is bordered by the Mediterranean Sea, a position that holds great historical importance in terms of exploration and trade. The generally rugged and mountainous terrain of Italy is home to a population of 58 million people. Politically Italy is divided into twenty regions and each region is unique in its own way. The culinary diversity, specialties and pride of each region are quite remarkable.

### **Historical background and regional cuisine**

Italy has a rich past, at one time, parts of the country were occupied by Etruscans, Spanish, French, Greek, Arabs, Austrian and Germans. Such occupations inevitably shaped the cuisine of Italy today. Italy was made up of separate and disputing states, till it was unified in 1861 by Giuseppe Garibaldi.

#### **Northern Italy**

The Romans who ruled Italy and at one time almost all of Europe, for about a thousand years has left a lasting effect on Cookery in Italy, they brought in a lot of local customs and foods of the countries they conquered. The port city of Venice was the centre of trade with the Middle East. This prosperous city had control over the trade of rare foods of the time like sugar, coffee and spices. Western areas of North Italy like Lombardy and Piedmont have strong French and Swiss influences in their cuisine.

Northern Italy is considered the most prosperous area of the country of which the most famous are the Eastern part of Veneto known as Emilia-Romagna. The cuisine is dominated by meat and seafood. The green pastures produce a lot of milk, butter and cheese, e.g. Gorgonzola and Mascarpone. Fresh Pasta, polenta and rice are consumed in large quantities. Risotto is the staple of the people of Piedmont. Popular cooking techniques include boiling, stewing and braising. They use a special oven called a Fogher that is used for spit roasting. Popular pasta shapes of this region include anolini, cappelletti, lasagna, tagliatelle tortelli and tortellini. Other specialties of this region is the Parmigiano- Reggiano(Cheese), Prosciutto di Parma (Ham), and Aceto Balsamico Tradizionale(vinegar).

#### Central Italy

The early settlers on central Italy were the Etruscans who migrated from the Asia Minor as early as 800 BC The Etruscans were an advanced civilization with a major empire. The Romans flourished between the 5th Century BC to 5th Century AD) with Christianity at its core. The Romans built an extensive system of roads and a central market. The great Renaissance originated here in this region and the first ever cooking school was founded in Florence. From the culinary point of view the most significant family in Italy is the Medicis of Florence. It was the Catherine of Medici who single handily shaped the future of Culinary and exported it to France when she married King Henri II. Central Italy comprises of seven regions of which Roma the capital city of Italy and Christianity is located in the region of Latium. Central Italy is known for its livestock, mainly beef, goat and lamb which are commonly gritted, spit roasted or deep fried.

#### Southern Italy

Southern they have been greatly influenced by Greeks and Arabs from North Africa. The regional cuisine began in Southern Italy with the arrival of the Greeks in 415 BC. The Greek introduced wheat cultivation, Bread making, olives, honey and nuts. Romans ruled later but did not contribute much to cuisine except for the introduction of fava beans. Sicily which is at the foot of Italy in only 145 Km from the African continent, and was conquered by the Arabs as early as the ninth century AD They bought in exotic ingredients and planted citrus trees. They also introduced the notion of combining sweet and sour flavours. Saffron, nuts, rice, couscous, sugar cane and ice cream are just a few of the contributions from the Arab world. Olive oil is the preferred fat of the region. Naples at the ankle of the Italian leg is a very historical place; it was the gateway for the entry of Catalan Cookery. Pizza's home is the Neapolitan area of Southern Italy. The great difference in Italy's climate and geography are favourable to many different agricultural forms. This means that while a superb cheese is produced from Cow's milk in the north, the south has cheese made from sheep's milk which is just as excellent Northern recipes use butter and cream, the central provinces used lard and olive oil and the south is predominately olive oil.

Respect for the basic produce and a feeling for the freshness and quality of the ingredients determines the lively seasonal variety of dishes. As result the range of products on offer is extensive and high in quality. Unadulterated taste and inspired simplicity are the main characteristics of Italian cookery, as well as health and economical attitude towards food and eating habits. Coffee with B/F is generally consumed by 10am, followed by Lunch or pranzo which is more prevalent in the rural areas where it is a family affair with substantial 3 or 4 courses. More extensive Lunch is

saved for Sundays and other special days. The evening meal is eaten around 8 pm which could again be 3 or 4 courses. A midnight snack is quite common Antipasta is the Italian word for appetizer or starters they are composed of high quality ingredients like olive which maybe raw, pickled or marinated, toasted slices of bread, salads or sausage or ham in thin slices along with melon and figs.

- Bread Specialties (PANE)
  1. Bruschetta : toasted slices of bread with garlic, olive oil and tomato.
  2. Cilindrati : croissants made from thinly rolled bread dough.
  3. Grissini :Bread sticks from Turin.
  4. Crocetta :Hot cross Buns

Another famous specialty of Italy is the Pizza.

e.g. of Pizza alla :-

Napolitana consisting of tomatoes, Mozzarella and anchovy fillets.

- Prosciutto Ham
- Funghi- Mashrooms

### Specialties of Italy

- Ham is another specialty. Prosciutto de Parma

Italy's most famous ham comes from the province of Parmal north-west of Bologna. The quality of PARMA Hams is created with the pigs being fed on barley, corn and fruit. When slaughtered it must be at least 10 months old, to ensure that the meat is firm and rosy and surrounded by a thick layer of fat. Raw leg should weigh 10 kgs. It is then brined in three phases and then left to dry. They are then matured for a year in cellars with limited supply of air. After 12 months they are ready to eat.

- Pasta Secca (Dry)

Italians are very fond of dry pasta. There are about 300 diff varieties. Pasta is made from durum wheat semolina and can be divided into three categories.

1. Pasta Corta : Short noodles and may be many shapes such as spirals, wheels, stars, snails, shells and short tube.
2. Pasta Lunga : long noodles which include the entire spagethi and tagliatelle family- 4 inch and above.
3. Pasta Ripenna : filled pasta parcels, fortellini and raviolli are the best known.

### Some famous pasta names:

1. Bucatin : Long smooth hollow noodles.
2. Cannelloni : Finger length hollow good for filling
3. Penne : Short pipes with slanting edges.
4. Farfalla : shaped liked butterflies.
5. Spirale : Spiral shapes
6. Taglintelle : Ribbon noodle.
7. Lasagne : smooth sheets of pasta

**Gnoochi:** They are small dumplings or gruels and are a passion for Italians among a wealth of variations a common type is made with mashed potatoes mixed with milk served with a lots of Parmesan, tomato or meat sauce. Potato may be replaced with semolina, chestnut flour, cornmeal and even pumpkin.

**Polenta:** Polenta is an ancient dish made with any grain be it millet, buckwheat, chickpeas or broad beans. After Columbus bought corn to Europe, it became the staple for production of Polenta as the Polenta made from corn kernels became the most economically viable grain. Polenta is delicious with rabbit, lamb, game, sausages, cream dishes and fish dishes.

**Parmiginao Reggiano:** The most famous of all Italian cheese, which has been produced using the same method for seven centuries. Produced in stipulated area which are the provinces of PARMA including Reggio, Emilia, Modena and Mantera on the right bank of the river Po and Bologna on the left bank of River Reno. Cows must be grazed on a meadow or are fed on alfalfa. Milk is poured into traditional bells shaped copper vats. It is then curdled. The curd “Cagliate” is then again reheated twice at 45°C and then at 55 °C. The resultant mass is removed in cheese cloth and deposited in wooden or metal moulds. It is then left in salt solutions for 20-25 days. They are then dried in the sun before being stored in the “Cascina” on wooden shelves to mature slowly regularly turned and brushed. Two gallons of milk produces a pound of cheese they are hard cheeses.

**Pecorino:** They are produced is south Italy. It is a hard cheese made from sheep’s milk and are moulded in basket work cylinders which are woven in SARDINA. When matured the rind is hard and dark. Pecorino Romano is considered the best.

**Gorgonzola:** Originally only produced in the little town of the same name near Milan. It is made from full cream pasteurised cow’s milk. Milk is heated up to 32° C and curdled with rennin. Spores of *encillum glaucum* are also added. They are poured into round Moulds. It is a blue veined cheese.

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### 1.7.3 CHINESE CUISINE

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As one travels around the world today, one cannot help being impressed by the extent to which Chinese food and cooking has been established in-almost every corner of the earth. The popularization of Chinese cuisine lies in the unique traditions and techniques of Chinese cooking, and in the inherent appeal of Chinese food and flavours \_to the palate, and also Chinese food can be extremely economical as well as being highly nutritious, because, most ingredients are cut into small pieces, then quickly cooked so as to retain their natural goodness. Chinese culinary' art has gone through thousands of years of refinement and development, but the Chinese unique way of cooking and preparing food, remains basically unchanged. Archaeological finds of the Bronze Age (around 1850 BC) indicate that the Chinese had utensils such as bronze Cleavers for cutting up foods into small pieces and cooking them in animal fat, using a bronze pot not dissimilar to the modern wok. There is data to prove that as long ago as the Zhou dynasty (12 C BC) the Chinese used Soya sauce, vinegar, rice wine, fruit jam and spices as seasoning for their cooking and that elaborate and complicated cooking methods were already being employed. By the time of China's greatest sage Confucius (551 - 479 BC) who was an acknowledged gourmet recorded that the importance of heat application and blending of different flavours were emphasized in Chinese cooking; and the uses of high, moderate or low heat, the blending of sour, piquant, salty, bitter or sweet flavours were all given their

correct application in order to achieve a harmonious whole. This theory of harmony is one of the main characteristics of Chinese cuisine to this day.

Today, Chinese cuisine is generally considered along, with the French as one of the two greatest cuisines. It is simple, highly adaptable to the taste of the other countries and best of all it can be prepared by anyone, possessed of a little patience. Tai See Foo - or Master Chef is a much-disciplined man, nowhere is the Tai See Foo in such importance as in China, where, in relation to the Chinese philosophy of life, his profession over the centuries has been looked upon with the greatest respect in the community.

The Chinese value food highly and rarely wastes any, many recipes require the use of leftovers and cooking ahead is standard practice. The basic flavours are six – Sweet, Sour, Bitter, Spicy (sharp) Pungent and Salty. Their distribution, proportion and use must be controlled for proper blending. Meat has always been a major item in Chinese diet; however the meat ration per person was small. Efficient utilization, proper colour arrangements and palatability often required highly imaginative combinations. Often the meat could only be flavouring for a dish rather than the main ingredient. China's economy has seldom been able to afford such animals as the cow and the lamb, inadequate pastureland for cattle has made raising these animals difficult. Pork is therefore China's most common meat. In the north, mutton is commonly used, particularly by the Chinese Muslims. Many Chinese Buddhist for religious reasons, will eat only vegetable, the cooking of which was developed to a high degree. The scientific study of vegetable became a part of Taoism and its devotees devised a highly nutritional vegetarian diet, an art so refined that their vegetarian dishes resemble meat in taste as well as in texture. The elements that contribute to the wide sensual appeal of Chinese food, which make it so acceptable to all people world over are:

1. Chinese meals are communal meals and communal dishes served on the table are of necessity, bigger and fuller than the average dishes, they are therefore bound to create a greater visual impact and are more sumptuous in appearance. The exoticism of size and variety is further enhanced by the Chinese use of heat as an integral part of flavour – the use of heat to induce, ignite, and set ablaze all the latent desires in our appetites. Hence in a well-served Chinese meal, the time-lapse between the food leaving the hot pan and its arrival on the table is measured not in minutes but in seconds.
2. Chinese dinner is a multi-dish or multi-course meal.
3. The frequent and deliberate exploitation of changing textures both the harmony and contrast of textures are exploited.
4. The bulk intake of rice produces the ultimate physical satisfaction in eating along with several soups.
5. The use of soya beans and their by-products - soya sauce, soya paste, soya-cheese, soya bean curd, etc. are able to seduce our palate and taste buds.

The basic purpose of cooking is primarily to render food edible, and secondly to render it more enjoyable to eat. To achieve these purposes two methods are generally employed, heating and flavouring.

Heating:

Take the heating of food, which is basically capable of only a limited number of variations such as heating by air, baking, roasting, heating by fire or radiation, grilling, barbequing, heating through the medium of water or by oil or heating by conduction. By combining the different methods, by varying the pace of heating (Fire - Power), by



varying the speed or lengthiness (time) of treatment by varying the stability of mobility (stir frying) of food while being heated the Chinese have developed some forty different accepted heating methods, each with its well defined and established terms of reference and conception.

#### Flavoring

In the case of flavouring the Chinese have developed and advanced even farther than in heating (cooking). This is due to the normal Chinese practice of cross cooking different types of food which results of large scale cross blending of flavours. Although not all Chinese dishes are mixed dishes - some consists of only one ingredient cooked in the simplest way. The seasoning materials and sauces are often applied at the last stage of cooking. The flavouring of Chinese cooking is achieved through a multi layer process i.e. Through the use of- supplementary ingredients for cross cooking to provide variety and difference in texture and material, the use of flavouring ingredients, seasonings and sauces to further enhance the taste and flavour and finally through the serving of table condiments to provide the individual diners with the opportunity to do their own personal "touch-ups" before consumption. In order to reduce confusion, it is normal practice in Chinese kitchens to divide the job of cooking into two clear stages: Preparation and actual cooking. The task of preparation and the task of cooking are usually carried out by two different persons. The preparations and portioning of the principal and supplementary ingredients are usually carried out by the assistant cook, while the chef attends to the firing (control of the heating) and all the work over the stove including flavouring and the application of all the sauces and seasonings.

**The main characteristic of Chinese Cuisine** Actually, Chinese cooking is often simple, even for beginners provided you follow a few firm rules. The first thing to remember is that preparation and cooking are separate procedures; all preliminaries must be completed before actual cooking begins. Chinese foods must often be cooked quickly and at very high temperatures. Chinese use oil in their cooking – usually vegetable oil. With this oil one can get the high temperatures needed to seal in the flavour and original colour of the foods and also to preserve the all important crispness and vitamins of vegetables. They do not use butter and many other dairy products either vegetables rather than meat predominate. Soups play various parts in the symphony of a well composed meal - not only is there one as a light appetizer but clear soups are often used between courses as palate cleansers. Richer soups like velvet corn, may however be served as a separate course. There exists a certain 'uniqueness' that distinguishes Chinese cooking from other food cultures. There is the Chinese division when preparing and serving food between TAN' (grain and other starch food) and 'CAI (meat and vegetable dishes) Grains in various forms of rice or wheat flours (bread, pancakes, noodles or dumplings), make up the FAN half of the meal. Vegetables and meat (including poultry, meat and fish) cut up and mixed in various combinations into individual dishes constitute the CAI half. A balanced meal must have an appropriate amount of both FAN and CAI. It is combining' various ingredients and the lending of different flavours for the preparation of CAI that lies the fine art and skill of Chinese cuisine.

The other distinctive feature of Chinese cuisine is the harmonious blending of colours, aromas, flavours, shapes and textures in one single CAI dish. The principle of blending complimentary or contrasting colours and flavours is a fundamental one - the different ingredients must not be mixed indiscriminately. The matching of flavours should

follow a set pattern and is controlled and not casual. The cutting of ingredients is another important element of Chinese cooking in order to achieve the proper effect. Slices are matched with slices, shreds with shreds, cubes with cubes, chunks with chunks and so on. This is not only for the sake of appearance but also because ingredients of the same size and shape require about the same amount of time in cooking. This complexity of interrelated elements of colours, flavours and shapes in- Chinese cooking is reinforced by yet another feature:

**Texture** - A dish may have just one or several textures, such as tenderness, crispiness, crunchiness, smoothness and softness. The textures to be avoided are: sogginess, stringiness and hardness. The selection of different textures in one single dish is an integral part of blending of flavours and colours. The desired texture or textures in any dish can only be achieved by the right cooking methods. In all different methods of cooking the correct degree of heat and duration of cooking time are of vital importance.

**Regional cooking styles:** China is a vast country and as such is exposed to extremes of both geography and climate. This naturally results in the growth of different agricultural products, so it is of little wonder that cuisines vary from province to province. Looking at the map of China, it is not difficult to understand why there should be such a rich variety of different styles, throughout the land. Even though there is no official classification of various regional cuisines in China, but it is generally agreed SICHUAN in the west, SHANDONG in the north, CANTON in the south and JIANGSU in the east represents the four major regional cooking styles of China. In addition, four more provinces ZHEJIANG, FUKIEN, ANHUI in the east and HUNAN in the west are usually included in the role of honour while one talks of the "Big Eight" distinguished schools of cuisine in China.

### **Northern School**

Archaeological evidence shows that in about 5000 BC, the inhabitants of North China had begun to farm, settle down and make painted pottery, eating and cooking vessels. Some of the most conspicuous traces of early Chinese culture have been found at sites that lie along the valley of the Yellow River, which is why this area is sometimes described as the "Cradle of Chinese Civilization". Two ancient capitals of LUOYANG and KEIFENG are both situated just south of the Yellow River in Hunan province ("HU" is the Chinese word for "river" and "NAN" means "south"). The noblemen and the imperial families live in such luxury that their chefs invented and perfected many of the Chinese classic dishes. These recipes were passed down through the centuries, and were moved to the capital, Peking and beyond. China's North has two very long and distinct seasons (winter and summer) with short transitional periods in between. Winters are dry and cold, with temperatures often below freezing. Summers provide intense heat and rain. Its diverse terrain (hills, valleys and rivers) give variety to the region's agriculture. Due to the extremely dichotomous climate, the land's produce is hearty: mainstays of wheat and corn, especially important to the Northern China economy, dominate the northerner's dietary needs. Crops are then manufactured into wheat-flour for use in common cuisine: noodles, stuffed buns, dumplings and steamed bread are just a few of the wheat products consumed in the provinces of this region. Although little rice is grown in this region, other hardy plants such as barley, millet, soybeans, cabbage, squash and apples predominately appear in northern Chinese agriculture and cooking. In the northern school the staple food is not rice but wheat flour, from which are made many noodle, dishes,

steamed bread and dumplings. Northern food tends to be lighter than that of other provinces. From Peking (meaning northern capital) and its neighbouring districts come notable dishes prepared with wine stock. Northern cooking includes pungent sweet and sour dishes and more subtle, delicately seasoned foods. The use of garlic and spring onions is also characteristic. Much of the north is bordered by Mongolia where people eat a lot of mutton. Food from Inner Mongolia and Shantung forms the backbone of northern cuisine.

Now Peking cuisine is quite a different matter, it is not a separate regional school, but rather the combination of all China's regional style of cooking. Being the capital of China for many centuries Peking (or Beijing as it is now called) occupies a unique position in the development of Chinese culinary art. Peking cuisine has been defined by the eminent Chinese gourmet Kenneth Lo as "The crystallization of many inventions and performance of the generations of imperial chefs of different dynasties which have ruled in Peking for nearly a millennium, and the local dishes of the people of Shandon and Hubet which have been in the habit of preparing together with all the culinary contributions which over the years have established their reputation in the old capital. Peking cooking is in short, the top table of Chinese culinary art. Peking cooking exhibits the greatest ingenuity and inventiveness.

Notable flavours and dishes -

Beijing is known for Jiaozi, the traditional Chinese dumpling, and Peking duck. Jiaozi dumplings are often filled with pork and vegetables, but variations may include sweet fruits (dates) or chestnuts. Peking duck is a traditional delicacy perfected during the Qing Dynasty and served to important and wealthy individuals throughout history. The duck and its skin (a delicacy) are served with Hoisin (Peking) sauce in flat-bread wrappers.

Northern cuisine includes the Henan (north of the river) region. Strikingly unique from other northern flavours is the Shaolin vegetarian cuisine. Chinese Buddhist belief has for centuries prohibited the eating of animal flesh, and the monks here have spent an age perfecting the cooking of all types of vegetarian food. This cuisine is very nutritious and healthy.

### **The western school**

The Szechuan style of cuisine arose from a culturally distinct area in the central western part of China, a province known as Sichuan. This area of China came into its own culturally towards the end of the Shang Dynasty, during the 15th century. However, it was also the climate of the area that helped to shape the culinary traditions that were to arise from Sichuan province and make their way into the realm of international cuisine. The province from which the cuisine that the world knows as Szechuan evolved is often hot and humid, and this contributed to this necessity of preparing foods in ways that differ significantly from other regions of China. Szechuan cuisine is primarily known for its hot and spicy dishes, though naturally there is more to Szechuan food than spice and sauces rich and strong in flavour. Much of the spicing of regional Chinese cooking is based upon bringing together five fundamental taste sensations – sweet, sour, pungent, salty and bitter. The balance of these particular elements in any one dish or regional cuisine can vary, according to need and desire, especially as influenced by climate, culture and food availability.

In Szechuan cuisine, there are a variety of ingredients and spices used to create these basic taste sensations. These include a variety of chilli peppers, peppercorns over

various types, Sichuan peppers, which are in reality a type of fruit, not pepper, and produce a numbing effect in addition to their warm flavour. Sichuan peppers, also called flower pepper and mountain pepper, are a traditional part of the Chinese five spice powder, or at least of those that are modeled upon the most authentic versions of the spice combinations common to regional Chinese cooking. Other ingredients used commonly in Szechuan cuisine to create the five fundamental taste sensations include different types of sugars, such as beet root sugar and cane sugar, as well as local fruits for sweetness. The sour comes from pickled vegetables and different varieties of vinegar. A special bitter melon is added to many dishes to offer the touch of bitterness that complements other flavours. Other spices and flavours include dried orange peel, garlic, ginger, sesame oil and bean paste. Salt is important to Szechuan cuisine, and the area produces uniquely flavoured salts that help to distinguish authentic Szechuan cuisine from the other regional cuisines from China.

Szechuan cuisine is marked by its rich traditional flavours, which stem from a culture of hundreds of years and are in part shaped by the natural forces of climate. Authentic Szechuan cuisine offers a unique dining experience made up of adventurous and creative taste sensations.

### **Specialties**

Hunan (south of the river) cuisine: Renowned for its soups, is one of the oldest and richest also noted for its spicy, pungent and flavourful dishes. Hunanes are especially fond of using chillies, sweet peppers and shallots in cooking. Sichuan (Szechuan) cuisine: hot, spicy chillies, ma po doufu, hot pot Famous for its heat and distinct flavours, Sichuan cooking mastered the light cooking techniques of stir-frying, sautéing, and dry-braising. One of the region's most famous recipes is ma po dou fu, a spicy bean-curd and vegetable dish cooked with some of the most powerful chillies in the world. In traditional Chinese medicine and nutrition, hot chilli peppers are considered helpful in reducing the —internal dampness. The humid climate also compels a creativity and variety in food preservation, including techniques such as pickling, salting, drying and smoking. Inland cooking also makes much use of the fungus called Cloud ear or, Tree ear. Tea smoked duck, Chicken chilly, Liver Paste Soup, Hot and Sour Soup, Beans A La Szechwan, Dong An Chicken, Fried crab, Soy Braised duck, sliced Hoi-sin Pork, Bean curd, Spiced Turnip etc., are some of the famous dishes of this region.

### **The Eastern School**

The Yangtze, China's longest river which traverses the width of China from west to east flows through China's leading agricultural regions-Sichuan and Hunan (on the upper ) Hubei and Jiangxi (on the middle) Jiangsu and Zianzgi (on the lower), which contains some of the most fertile land in China. Both wheat and rice are grown here, as well as other crops which include - barley, corn, sweet potatoes, peanuts, and soya beans. Fisheries abound in the multitude of lakes and other tributaries and deep sea fishing has long been established in the coastal province of Jiangsu and Zhejiang The areas that cover the middle and lower regions of the Yangtze are traditionally referred to as "Land of Fish and Rice", and is collectively known as Jiangnan ("JIANG" means "great river" referring to the, Yangtze and 'NAN' referring to the south), and it boasts a number of distinctive cooking styles. The Yangtze River delta has its own cooking style known as HYAIYANG with the culinary centre in Shanghai that is China's largest city which lies on the Yangtze estuary. South East China has always been regarded as the most culturally developed and economically prosperous region. Both Nanjing in Jiangsu and Hangzhou in Zhejiang have

been China's capital of several dynasties; other culinary centers are to be located in YANGZHOU (Yangchow), SUZHOU and ZHENJIANG. Yangchow fried rice, chow mien (open fried noodles), wantons, spring rolls, dumplings and many other Cantonese dim sum dishes have all originated from here. South of Zhejiang is the province FUJI AN (FUKIEN) which is sometimes grouped in the Eastern School, but its cooking style is more influenced by its southern neighbour Canton, so very often Fukien cuisine is included with Cantonese in the Southern school. Taken as a whole, Eastern cuisine is rich, decorative and rather on the sweet side; unlike Peking food, garlic is used sparingly, if at all.

The area as a whole is renowned for certain products and dishes: the specially cured Chinhua ham, with its pinkish red flesh and succulently savoury-sweet taste, the rich dark Chinking vinegar and the amber-coloured Shaohsing rice wine. Classic dishes include Crisp stir-fried shrimp, Eel cooked in oil, Yangchow fried rice, Lion's head and fish from the West Lake with a sweet and sour sauce. One special cooking technique of the region has been adopted nationally. This is hung- shao the red-braising method of cooking, whereby the ingredients (mainly meat, poultry and fish) are cooked slowly in an aromatic mixture of thick dark soy sauce and rice wine. When, at the end of cooking, the sauce is reduced and spooned over the main ingredient, the resulting taste is both rich and fragrant. Shanghai cuisine is the least known outside China. Its oiliness and sweetness are perhaps less appealing to the Western palate, and because it is decorative, it tends to be labour-intensive. Moreover, it depends largely on fresh local produce; the famous Shanghai crabs, studded with yellow roe in the autumn, have no counterpart elsewhere and for the delicate taste of the famous West Lake fish one has to go to Hangchow. The staple food of this region is rice. The cooks on the coast use more soya sauce and sugar and specialize in salty and gravy-laden dishes. Fish and shell fish from the many rivers and the neighbouring sea are popular ingredients. These are gently spiced concoctions of meat, chicken, duck and sea food with, of course lots of vegetables. Fukien produces the best soy sauce and therefore its cuisine has a good deal of stewing in this sauce or "red cooking" as it is called because of the colour the sauce imparts. The soups are clear and light. The Fukienese excels in their soft spring rolls and sea food. Fukien is also famous for its pork and chicken dishes made with sweet-tasting and fermented rice paste.

Speciality and Popular dishes:

Yangchow fried rice, Chow mien, Spring rolls, Dim sums, White cut pork, lion's head (pork meat balls with cabbage - the alarming name of this dish refers to the pork meat balls which are supposed to resemble the shape of a lion's head and the cabbage which is supposed to look like its mane), Squirrel fish.

The Southern School:

The Pearl River delta, with Canton as a provincial capital of Guangdong (Kwangtung), is undoubtedly the home of the most famous of all Chinese cooking styles. Unfortunately the reputation of Cantonese cuisine has been badly damaged by a so called 'chop suey' food outside China. Authentic Cantonese food has no rival and has a greater variety of food than any other school because Canton was the first Chinese port open for trade, therefore foreign influence are particularly stronger in its cooking. There are many pig and poultry farms and fish ponds. High, quality tea is a special product of Fukien, while all along the coast fish and sea food - crabs, cray fish, shrimps, prawns, scallops, clams - are plentiful. This wealth of ingredients has helped to make Cantonese cooking the most versatile and varied of Chinese cuisines. Cantonese food is not highly seasoned,

instead a harmonious blending of different flavours is sought in order to bring out the best of the ingredients. Cantonese cooks are at their most skilful when they stir-fry dishes. Red-braised dishes are an eastern contribution to the Chinese gastronomy but southern stir-fry dishes reign supreme nationwide. Their 'wok fragrance' a term used to describe the aroma so desirable in stir-fry dishes is matchless. Southern cooking is subtle and the least greasy of all the regional styles. The cooks excel in stir-frying. At its best, the cuisine tends to be more costly than the others because the cooks use highly concentrated chicken bouillon as the basis of their soups and general cooking: They like to use nuts and mushrooms in their dishes. They prepare many varieties of sea food and lots of roasted and grilled pork and poultry. Steamed dishes are also featured. Fisheries play a major role in the economy, Guangdong contributes about one fourth of China's fish catch (over 20% of the fish caught here are fresh water fish). Rice is a dominant food grain; the other crops are tea, tobacco, peanut, sugarcane and sub tropical fruits such as bananas, pineapples, oranges, tangerines and lychees.

Hainan Island is the only truly tropical area of China and produces coconuts, coffee, natural rubber and figs.; The Southern School consists of three distinct styles of cooking: Canton, Chaochow. (Sv atow), and Dongjiang (also known as Hakka), which means 'family of guest', which refers to the immigrants from North China who settled in the South during the Song Dynasty after the invasion of Mongols in the 13th Century. So it was the Hakka's who introduced noodles, wantons and dumplings etc, into the Cantonese diet. There was a mass immigration overseas after the 17th century both by the Cantonese and the Hakka. When Swanton was opened to foreign trade in 1858, it became a major port for Chinese immigration to South East Asia, America and Europe. That is why; the first Chinese restaurant to open abroad introduced only Cantonese cooking to the outside world. Schools of cooking there are two other schools, though not regional in character, nevertheless should be included here among China's various styles of Schools of Cooking, namely the Moslem and Vegetarian School.

**Specialized and popular dishes:** Dim-sum, Shao-mi, Cantonese roast duck, Sweet and Sour Pork. Pork Goose, Ducks webs in oyster sauce, Stuffed green peppers, Shark's fin soup, Turtle soup etc. are very famous.

**The Moslem School:** The Chinese Moslem known as "HUI" though Chinese speaking are distinguished from the Chinese by their affiliation with the Sunni branch of Islam. One theory is that they are descendants of the Moslems who settled in China in the 13 century and adopted the Chinese language and culture. There are nearly 5 million Hui widely distributed throughout almost every province in China, but their traditional areas of settlement is in the North-West with heavy concentration in Hunan, Shanki, Hubei and Shangdong. They form the Chinese Moslem school, together with two other national minorities: the UYGOR group in XINJIANG (4 million, virtually all Moslems), and about 1.5 million MONGOLS who are traditionally nomadic, and therefore, like the Moslem, do not eat pork. Their daily diet consists of beef, mutton, milk and butter, items an average Chinese has no taste for.

**The Vegetarian School:** Chinese vegetarians are not allowed anything remotely associated with animal including egg and milk. They obtain their proteins mainly from soya beans and its byproducts such as bean curd (tofu), nuts and fungi. Chinese vegetarian has a long history; its origin can be traced to as far back as around 500 BC,

when the Taoist School of Thought developed the hygienic and nutritional science of fruit and vegetables. Some centuries later when Buddhism which abhors the killing of any living creature and the eating of flesh in any form was introduced into China from India, this philosophy was readily grafted into Taoist school of Cooking and a new form of vegetarianism was born. Apart from the extensive use of fresh and dehydrated vegetables the vegetarian chefs have developed a new art by creating food that has become known as imitation meats. This imitation pork, chicken, fish and prawns and so on bare an amazing resemblance to their fleshy counterpart in form and texture, though not quite in flavour.

### EQUIPMENT AND UTENSILS

The Chinese cuisine consists of very few basic implements unlike the western kitchen. To start with only four of the most rudimentary implements are essential to cook Chinese food, i.e. Cleaver, chopping block, wok and stirrer. The Chinese cooking utensils are ancient designs, they are made-of basic and inexpensive materials and they have been in continuous use for several thousand years. As for the rest of the cooking utensils such as sieves, spatula, strainer, casserole, steamers you will find the western version to be less effective. The other tools which are used in the Chinese kitchen are cooking chopsticks, bamboo steamers, strainers, Mongolian fire pot ladles, fish slices, wok-brush, wok scoop, bamboo mat, etc."

**Cleaver:** The Chinese cleaver is an all purpose cook's knife that is used for slicing, shredding, peeling, pounding, crushing, chopping and even for transporting cut food from the chopping board or to a plate directly to the wok. At the first site, a Chinese cleaver may appear to be hefty, gleaming ominously sharp but in reality it is quite light, steady and not at all dangerous to use provided you handle it correctly and with care. Cleavers are available in a variety of materials and weight. They all have a blade of about 8-9 inches long and 3-4 inches wide. The heaviest weighing almost a kg called chopper is really meant for the professionals and is excellent for chopping bones such as drumsticks, pork spare ribs etc. The smaller and much lighter slicer with a thinner and sharper blade is convenient for slicing, meat and vegetables. But most Chinese cooks prefer a medium weight, dual purpose cleaver known as the civil and military knife (wen-wu-dao in Chinese ).The lighter front half of the blade is used for slicing, shredding, and scoring etc. and the heavier rear half of the blade is used for chopping and so on. The back of the blade is used as a pounder and tenderizer and the flat side is used for crushing and transporting. The end of the handle acts as a pestle for grinding spices.etc,. The blades of a cleaver should be made of tempered carbon steel with a wooden handle. Stainless steel cleavers with metal handles may look good but require more frequent sharpening, also the handle gets slippery, and therefore they are less satisfactory for both safety and steadiness. Always keep the cleaver blade sharp and clean. To prevent it from rusting and getting it stained wipe it dry with cloth or kitchen paper after use. Sharpen it frequently on a fine grained whet stone. Try to get a whetstone that has two different' grades of surface. Use a rough grain only if the blade has become blunt and the finer grained surface for a sharp finish to the edge. Lubricate the stone with vegetable oil or water and then put a damp cloth beneath it for stability. A cleaver of medium weight made of carbon or stainless steel is ideal for general use.

**Chopping block:** The traditional Chinese chopping block is a cross section of a tree trunk. Made of hard wood they range from about 12.inches in diameter and 2 inches thick, to giant ones up to 20 inches by 6-8 inches .The ideal size should be about 16 inches in diameter and at least 3-4 inches thick to be of any real use. To prevent it from splitting, season a new block with a liberal dose of vegetable oil is applied on both sides. Let the wood absorb as much oil as it will take and sponge the block with salt and water and dry it thoroughly. Never soak the block in water nor wash it with any detergent - after each use just scrape it clean with the blade of a cleaver then wipe the surface with a sponge or cloth wrung out in plain hot water. Always stand the block on its side when not in use. Never cut raw ingredients and cooked food on the same surface. Use different block or board for the two types of food for hygienic reasons. Use one side for chopping only then the other side should remain smooth enough for pastry making.

**Wok:** The Chinese cooking utensil known as “wok” is the pot or pan the correct translation should be gou. The wok was designed with a rounded bottom to fit snugly over a traditional Chinese brazier or oven which burned wood .charcoal or coal. It conducts and retains heat evenly and because of its shape the food always returns to the centre of the wok where the heat is most intense that is why it is ideally suited for quick stir frying. The wok is far more versatile than just a frying pan, it is also ideal for deep frying, its conical shape requires far less oil than a flat bottomed deep fryer and has more depth which means more heat and more frying surface, which means that more food can be cooked more quickly at one go.

Furthermore since the wok has a large capacity on the upper end as the oil level rises when the raw ingredients are added to it, there is a little chance for the oil to overflow and catch fire as often is the case with the conventional deep fryer. Now days a metal collar or ring purchased with the wok adapts it neatly to any gas or electric range. Besides being a frying pan (deep or shallow), a wok is also used for braising, steaming, boiling, and even smoking in other words the whole spectrum of Chinese cooking methods can be executed in one single use utensil. Basically there are only two different types of wok- the double handed wok with two handles on two opposite sides and the frying pan type single handed wok .Both types are usually made of light weight iron or carbonized steel, and the diameter ranges from about 12-18 inches. The single handed wok may appear to be unsteady and slightly tipped to one side, but in fact it is quite safe and much easier to handle particularly for quick stir frying since it offers you plenty of leverage of tilting and tossing.

The disadvantages of using a double handed wok is that you need strong wrist and oven gloves to lift it, as the metal handles get very hot even if they are reinforced with heat resistant plastic or wood. A dome shaped lid would be another useful item for certain braising and steaming dishes. Wok lids are usually made of light metal such as aluminum with a wooden or plastic knob on top as a handle. The dome shaped allows the cooking of a whole chicken or duck in a wok and the natural curve will guide the condensation inside the lid sliding down along the edge rather than dropping down directly onto the food that is being cooked.

**How to season the wok?:** A new wok is either coated with machine oil or wax to keep it away from rusting. This coating has to be removed after cleaning and a new coating should be done. This new coating prevents the wok from rusting and the food from



sticking to the bottom. After washing and cleaning the new wok, heat it on moderate fire, apply oil on all side of the pan and heat it again to smoking point. Remove and wipe it off with a clean cloth. The wok is seasoned and is ready for use. After use clean under hot water and brush off any food remains stuck. A well-seasoned wok has a glossy look and is a treasure of a Chinese cook as the “wok flavours”.

#### Stirrer

Some wok sets often consist of a pair of versatile stirrers in the shape of a ladle and a spatula, made of iron and stainless steel; both have a long handle with wooden tip. It is an indispensable utensil in the professional kitchen, since it is used for adding ingredients and seasonings to the wok besides being a stirrer and scooper during cooking as well as transferring food from the wok to the serving dish or bowl. It is also a measure for the cook, as the standard ladle will hold 6 fl oz (180 ml or 2/3 cup) liquid, slightly smaller than the rice bowl. The spatula or shovel has a rounded end to match the contours of the wok therefore it can be very useful for scraping and lifting fried food the bottom of the wok such as when cooking a whole fish etc. Sometimes it is used in conjunction with the ladle for stir frying, rather like when you are mixing or tossing a salad with a pair of spoon and fork.

**Laddles:** With long wooden handles (1/1/4) are preferred and the diameter of the bowl should be between 4 – 6 inches (8 oz). They act as stirrers and pourers. They are made of steel.

**Spatula or stirrer:** Made of steel, with flat end and wooden handle, its base is slightly curved at the sides so that it is easy to work on inside of the wok. It is used for turning the food while cooking.

**Strainer:** Made of steel, having diameter ranging from 8-12 inches, with a handle and fine wire mesh. This serves the purpose of straining stocks, deep-fried items and cleaning of oil in the wok etc.

**Broom stick:** A small broomstick is required by all Chinese chefs to clean and wash up the wok during work. The sticks should be firm and should not bend easily.

**Steamers:** Wok can be converted into steamer by placing a perforate plate halfway inside the wok, put some water beneath the plate and cover the wok with a lid. Other steamer is multi-layered of usually three tiered.

#### INITIAL PREPARATION

**Cutting Techniques:** The cutting of various ingredients into different sizes, thickness and shapes is an important element in Chinese cuisine. As mentioned earlier, the Chinese always cut their food into small neat pieces before cooking, partly because of fuel conservation, small pieces of food can be cooked quickly before the sticks of fire wood burn out and partly because, small pieces of food are easier to be served and eaten with chopsticks, since knives and carvers have never been used on Chinese tables. The fact that small pieces of food only require a short time for cooking, thus retain much of the natural flavours and nutritious value is an added bonus in Chinese cooking, which must

be regarded as an incidental discovery. When it comes to the actual cooking, the two most important factors are the degree of heat and the duration of cooking. These two factors are so closely related to each other that it is very difficult to give a precise cooking time in most recipes, since much depends on the size and condition of the ingredients, and above all, on the type of the stove and cooking utensils used.

All in all, there are well over 50 different distinct methods of cooking in Chinese cooking. They fall roughly into the following four categories:-

1. Water cooking: Boiling, Poaching, and Simmering
2. Oil cooking
3. Fire cooking:- Deep frying, shallow frying, stir frying, braising, roasting, baking and barbecuing
4. Steam cooking: Steaming.

**Cooking methods:** The Chinese divide the temperature of heat into "Military"(high or fierce and medium) and 'civil' (low or gentle and weak) And proper control of temperature and cooking time is the key to success. High or fierce heat is usually used for quick cooking for and tender foods. Different kinds of frying, steaming, instant boiling etc. call for a high heat. Medium or moderate heat can be used for quick -braising, steaming, and boiling. Low or gentle heat is used for slow cooking allowing the flavours to penetrate through all the ingredients such as roasting and simmering. Weak heat is used for long cooking turning hard ingredients soft. It is used for simmering, braising and stewing. Here are some 25 commonly used methods in Chinese cooking. One dish may require one, two or three methods each will produce a different effect.

1. **CHAO-** Stir frying. By far the most common method of Chinese cooking .Practically all vegetables will be cooked this way. Here a wok is most useful Heat the wok first then add the oil until it smokes add the ingredients, stir and toss .constantly no more than 2-3 minutes. In other way stir fry the ingredients in a little hot oil over a very high heat. This method is widely used and has many variations.
  - a. Pure stir frying: the raw ingredients are not marinated nor coated with a batter, they are just stir fried in hot oil and seasonings are added towards the end of cooking .Most vegetables are cooked in this way.
  - b. Braising stir frying: The main and supplementary ingredients are cooked in this separately .at first and then brought together with the addition of seasoning and stock or a thickening agent (usually of corn flour mixed with water) and braised very quickly over high heat.
  - c. Twice cooked stir frying: One ingredient has been previously cooked and is here cut into smaller pieces and stir fried with other ingredients and seasonings.
2. **ZHA -** Deep fry in hot oil over a high heat. Food is fried in a large quantity of oil over a high or medium heat. There are different variations of deep frying.
  - a. Neat deep frying: the raw ingredients are not coated with batter or flour.
  - b. Dry deep frying: Raw ingredients are coated with dry flour or breadcrumbs.
  - c. Soft deep frying: Raw ingredients are coated with batter, first and then deep fried for crispness.

3. **JIAN** - Shallow frying over a moderate heat. Similar to western way except that in some cases stock or water is added at the last minute forming gravy. A flat bottomed pan, little oil and medium or low heat is used. Seasonings are added when food is half done. The pan should be turned from time to time during cooking so that the heat is evenly distributed.
4. **BAO** - Rapid frying literally means to explode. It takes an even shorter time than stir frying using very high heat .Rapid stir frying is another form of stir frying , the ingredient or ingredients have been deep fried or rapid boiled first, they are then quickly stir fried over very high heat for a short period of time. Variations in this method include rapid stir frying in oil rapid stir frying in bean sauce and rapid stir frying with spring onions.
5. **SHAO** - Braising literally meaning to burn or in this case to cook. The ingredients are first fried in a little oil over a moderate heat, then simmered in stock until very little liquid or juice is left. Red cooking In this widely used method of cooking the meat is cut into small chunks then deep fried or par boiled or steamed until half done. Seasonings (Soya sauce, wine vinegar sugar etc.) stock or water are added to it ,the whole thing is brought to a boil and simmered until done.
6. **MEN** - Stewing, it is very similar to braising except that it usually takes longer over a low heat. Slow braising- the food must be fried first (light brown) then all the ingredients (seasonings etc.) are put in a tightly covered pot and simmered over a very low heat slowly like a casserole.
7. **DUN**. Simmering In this method of cooking no oil is used at all and the food is cooked over low heat .Slow cooking, there are two kinds of slow cooking in water. Slow cooking in water is a form of stewing, slow cooking, out of water involves a double boiling technique. When the pot that contains the food is immersed in a large pot of boiling water.
8. **ZHU** - Boiling over moderate heat. Boil the ingredients directly in water over low heat.
9. **CHUAN** - Rapid or fierce boiling over high heat for a very short period of time. This simple cooking is often used for making soups Bring the water or stock boil over-high heat add the ingredients and seasonings, serve as soon as the soup re-boils. No thickening agents added and the vegetables will be crisp and fresh.
10. **ZHENG** - Steaming needs no explanation .Traditionally the Chinese use bamboo steamers which sits in the wok .Another widely used in China not only for cooking .but also for treating raw ingredients before cooking by other methods, or to keep food warm after they have been cooked.
11. **LU** - Stewing in stock made of Soya sauce five spice powder and sugar over low heat. Soya stewing- a Soya-gravy is made first the ingredients are stewed in this gravy over a low heat.

12. **HUI** - Another form of braising - literally means “Assembly” normally a number of ingredients, some cooked, some semi-cooked are blended together for the final stage of cooking in a gravy using a high to moderate heat. This is a method of cooking a dish that consists of several different ingredients. Stir fry the ingredients first add stock or water and seasonings, boil over high heat for a short while, then thicken the gravy before serving .Alternately prepare the gravy first then add the partly cooked ingredients (deep fried or steamed ), cook over low heat, thicken the gravy and serve.
13. **KAO** - Roasting which hardly needs explanation, except that in China most kitchens are not equipped with ovens, therefore most of the roasting is done as barbecuing in a restaurant. The ingredients are first marinated or treated then either cooked in an oven or over an open fire like barbecuing.
14. **BAN** - Mixing raw food or salad or-cold dishes which are mixed together with a dressing.This method does not actually involve cooking, but simply calls for cutting the raw or cooked ingredients and dressing it with seasonings.
15. **SHAUN** - Instant boiling or rinsing thinly sliced ingredients are dipped into boiling water for a second or two, and then served with a sauce. This cooking method keeps the ingredients fresh and tender.
16. **AO** - Stewing or braising. Flavour a little hot oil with spring onions and ginger root then stir fries the ingredients for a short time. Now add the stock or water and seasonings, simmer over a low heat .The food should be soft and tender.
17. **QIAND** - Hot salads - Here the raw ingredients are parboiled or blanched first, then dressed with seasonings. The difference between cold salad and hot salad dressings is as follows:-
  - Cold salad dressing- Soya sauce, vinegar, and sesame seed oil.
  - Hot salad dressing: Ginger shreds, Sichuan pepper corn, salt, sugar and sesame seed oil.
18. **YAN** - Pickling- Pickle the food with salt and sugar or with salt and wine. Dishes prepared this way has a subtle fragrance and is crisp.
19. **TA - Pan frying**- The ingredients are coated with batter fried in a small amount of oil on both sides over a low heat until done. The ingredients may be deep fried first, and then finished off by pan frying. Seasonings and sauce is added towards the end of cooking.
20. **TIE-PAN** - Sticking frying- This is basically a form of shallow frying, but only one side is fried, the food is not turned over, so that one side is golden brown and the other side is soft and tender.
21. **LIU** – sauté- This is a special technique which involves two stages of cooking. First deep fry, quick or rapid boil steam or boil the ingredients until done, then mix with seasonings to make a sauce.

- Dark brown sauté Pour the sauce over the cooked foods and serve.
  - Slippery sauté Stir fry the raw ingredients and pour the sauce over half way through cooking, stirring constantly until done.
  - Soft sauté Steam or boil the ingredients and then, while they are still hot add a thin and delicate sauce.
22. **PENG** - Quick braising -This is one of the important cooking techniques and is always used with deep frying .The ingredients are cut into small pieces and deep fried first, then taken out of the oil and a sauce is added .While the sauce is hot stir fry over high heat and remove the wok from heat and continue stirring for few more times before serving.
23. **JIANG** - A soya braising. The difference between soya stewing and soya braising is that the ingredients are marinated first in the sauce in which it is cooked, with the additional stock and water. The sauce is reduced or thickened and is served with dish.
24. **PA** - Braising in sauce - In this method, a little oil is first flavoured with spring onions and or ginger root; the ingredients are then placed in the wok or pot and simmered until done.
25. **SHUN** – Smoking -Cooking with heat and smoke from burning materials such as saw dust, tea leaves, cypress branches, bamboo leaves or granulated sugar.

**THE CHINESE MENU:** Chinese menu bears no resemblance to western menus which are course wise. The Chinese cooking tradition makes for a greater harmony of living, an aspect of Chinese cuisine which has often been over looked. There is a great feeling of togetherness in the way the Chinese eat. They gather around a table and take all the dishes which are placed on the table in a communal style. Nobody is served just an individual portion in the western way. The chop-sticks are used not only as eating implements but also to help others to a choice piece especially from a particular dish this is usually an expression of respect and affection. Due to the multi course nature of the Chinese meal, eating and dinning have always been very much a family or communal event and Chinese food is best eaten this way, for only then can you enjoy a variety of dishes. An informal Chinese dinner served at home is essentially a buffet style affair, with more hot dishes then cold served on the table at the same time, to be shared by everyone.

A Chinese meal is served absolutely ready to eat there is neither last minute carving on the table, nor dishing out separate item such as meat, vegetables, gravy or sauce and no long prelude when you wait for everybody to be served before you start. At a Chinese meal, as soon as the first dish or course of dishes is placed on the table the host will raise his glass and say —Gan bei or cheers or bon appetit.

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## 1.8 AIMS AND OBJECTIVES OF COOKING

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Food is any substance consumed to provide nutritional support for the body. It is usually of plant or animal origin, and contains essential nutrients, such as carbohydrates,

fats, proteins, vitamins, or minerals. The substance is ingested by an organism and assimilated by the organism's cells in an effort to produce energy, maintain life, or stimulate growth.

Historically, people secured food through two methods: hunting and gathering, and agriculture. Today, most of the food energy consumed by the world population is supplied by the food industry, which is operated by multinational corporations that use intensive farming and industrial agriculture to maximize system output.

Primitive man made use of anything near his and to satisfy his need and" accidents and extreme hunger made many foods appetizing to our ancestors which might not appeal to us today if we had not inherited the taste for them. According to W. Mattieu Wilhams, "the fact that we use the digestive and nutrient apparatus of sheep, oxen, etc., for the preparation of our food is merely a transitory barbarism." Other authorities agree with him that the art of cooking may sometime be so developed as to enable us to prepare the coarser vegetable substances in an easily assimilated form without depending upon animals as middle men. The art of the cook has done much to make unlikely food materials attractive, but there is another phase of the question, and that is the problem how to make what we know is nourishing both pleasant and attractive. The cook of the past had to make the best possible use of the meager nutrients at hand. The cook of the present and future has the harvests of the whole world within reach all the year around. How shall such abundant material be combined to satisfy the palate without overloading the digestive organs? More important still, how shall we select and prepare foods that they may produce sufficient energy in the human body for the great tasks awaiting it in our complex civilization.

**Why and how people eat?:** All humans eat to survive. They also eat to express appreciation, for a sense of belonging, as part of family customs, and for self-realization. For example, someone who is not hungry may eat a piece of cake that has been baked in his or her honor. People eat according to learned behaviors regarding etiquette, meal and snack patterns, acceptable foods, food combinations, and portion sizes. Etiquette refers to acceptable behaviors. For example, for some groups it is acceptable to lick one's fingers while eating, while for other groups this is rude behavior. Etiquette and eating rituals also vary depending on whether the meal is formal, informal, or special (such as a meal on a birthday or religious holiday).

A meal is usually defined as the consumption of two or more foods in a structured setting at a set time. Snacks consist of a small amount of food or beverage eaten between meals. A common eating pattern is three meals (breakfast, lunch, and dinner) per day, with snacks between meals. The components of a meal vary across cultures, but generally include grains, such as rice or wheat; meat or a meat substitute, such as fish, beans, or paneer ; and accompaniments, such as vegetables and pulses. Various food guides provide suggestions on foods to eat, portion sizes, and daily intake. However, personal preferences, habits, family customs, and social setting largely determine what a person consumes.

What and how people eat is determined by a variety of factors, including economic circumstances, cultural norms, and religious restrictions. For example Indian Brahmin family sits on the floor and eats from a cloth laden with regional delicacies.

**Sources of food**

Almost all foods are of plant or animal origin. Cereal grain is a staple food that provides more food energy worldwide than any other type of crop. Maize, wheat, and rice - in all of their varieties - account for 87% of all grain production worldwide.

**Plant:** Many plants or plant parts are eaten as food. There are around 2,000 plant species which are cultivated for food. Seeds of plants are a good source of food for animals, including humans, because they contain the nutrients necessary for the plant's initial growth, including many healthful fats, such as Omega fats. In fact, the majority of foods consumed by human beings are seed-based foods. Edible seeds include cereals (maize, wheat, rice, et cetera), legumes (beans, peas, lentils, et cetera), and nuts. Oilseeds are often pressed to produce rich oils - sunflower, flaxseed, rapeseed (including canola oil), sesame, etc. Seeds are typically high in unsaturated fats and, in moderation, are considered a health food, although not all seeds are edible. Large seeds, such as those from a lemon, pose a choking hazard, while seeds from apples and cherries contain a poison (cyanide). Fruits are the ripened ovaries of plants, including the seeds within. Many plants have evolved fruits that are attractive as a food source to animals, so that animals will eat the fruits and excrete the seeds some distance away. Fruits, therefore, make up a significant part of the diets of most cultures. Some botanical fruits, such as tomatoes, pumpkins, and eggplants, are eaten as vegetables. Vegetables are a second type of plant matter that is commonly eaten as food. These include root vegetables (potatoes and carrots), leaf vegetables (spinach and lettuce), stem vegetables (bamboo shoots and asparagus), and inflorescence vegetables (globe artichokes and broccoli and other vegetables such as cabbage or cauliflower).

**Animal:** Animals are used as food either directly or indirectly by the products they produce. Meat is an example of a direct product taken from an animal, which comes from muscle systems or from organs. Food products produced by animals include milk produced by mammary glands, which in many cultures is drunk or processed into dairy products (cheese, butter, et cetera). In addition, birds and other animals lay eggs, which are often eaten, and bees produce honey, reduced nectar from flowers, which is a popular sweetener in many cultures. Some cultures consume blood, sometimes in the form of blood sausage, as a thickener for sauces, or in a cured, salted form for times of food scarcity, and others use blood in stews such as civet. Some cultures and people do not consume meat or animal food products for cultural, dietary, health, ethical, or ideological reasons. Vegetarians do not consume meat. Vegans do not consume any foods that are or contain ingredients from an animal source. Other foods not from animal or plant sources include various edible fungi, especially mushrooms. Fungi and ambient bacteria are used in the preparation of fermented and pickled foods like leavened bread, alcoholic drinks, cheese, pickles, kombucha, and yogurt. Another example is blue-green algae such as Spirulia. Inorganic substances such as baking soda and cream of tartar are also used to chemically alter an ingredient.

**Eating habits of people**

According to ICMR (Indian Council of Medical Research) the factors which are responsible for food habits of people are:

1. Age and height of a person
2. Gender of a person
3. Physiological status of a person
4. Locally available food items
5. Geographical and Climatic factors
6. Psychological status of a person
7. Nature of activity

1. **Age and height of a person-** Nutritional requirement of a person differs from one another depending upon the age and height. Food required by an infant differs from that of a child, an adolescent, adult and old age. Infants are given milk whereas children feed upon milk, semisolid and solid food, adolescent, adult depend mainly of solid foods whereas aged people go for semisolid ones. Their nutritional needs also differ accordingly. As height of a person is genetically built, so some extra nutrition is required for those who are taller than others because their body grows faster than the others.

2. **Gender of person-** females have more complex physical structure than the males and moreover they have to undergo various stages of development throughout their life and for which they should be provided well nourished food. Nutrition during Infancy and childhood remains same for both the genders, it differs only after the childhood stage when they become adolescent, and girls develop puberty and undergo vital changes in their body which includes menstruation, pregnancy, and child birth and lactation. It is at these stages that they require more nutrition than the males.

3. **Physiological status-** It is known that females do require more nutritional food than the males. People who are ill require different diet or those who are physically unfit are given some especial food to eat. A strict nutritional diet chart is maintained in hospitals and in the armed forces.

4. **Locally available food items-**The development of nutritional chart depends upon the ingredients locally available. The scientists and food technologists try to find out the substitutes locally and prescribe those to the needs. For example guava growing in the plains is found to be good substitute for apples which is found in the hills. People living in remote hilly regions depend mainly upon flesh of animals to fulfill their need for nutrients

5. **Geographical and Climatic factors:** These also change the nutritional requirement of the people. The food of people living in the mountains and hills mainly revolves around flesh, fruit and rice, where as those living in plains have access to variety of ingredients, similarly the food of the people living in dessert or near the sea shore have different nutritional need from others.

6. **Psychological status of a person-**people who are psychologically unfit tend to loose certain nutrients from their body. It is advisable to give cool water to a person who is angry. This cools down the temperament. People suffering from nausea are prescribed to have lime water or vitamin C tablets or likewise foods.

7. **Nature of activity-** ICMR has divided activity level for all people as:



- Sedentary workers- people who rarely do any physical activity like doctors, clerks, accountants, taxi drivers etc. they require less calories and nutrients daily for their physical needs.
- Moderate workers- people who do some physical activity daily, but not enough to burn out their calories. Teachers, peons, contractors etc require little more of nutrients than the above category.
- Heavy workers- like porters, factory laborers, farmers, rickshaw pullers require well balanced diet and that too in large amount to fulfill their nutritional requirements.

**Aims and objectives of cooking food are to develop :**

- Various taste development
- Various Textures
- Various consistencies
- Techniques used in pre-preparation
- Techniques used in preparation

The term cookery, as has been explained, means the preparation of both hot and cold dishes for use as food, as well as the selection of the materials or substances that are to be cooked. The importance of cooking foods by subjecting them to the action of heat has been recognized for ages; and while it is true that there are many foods that appeal to the appetite in their raw state and still others that can be eaten either raw or cooked, there are several reasons why it is desirable to cook food, as will be seen from the following:

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### **1.8.1 IMPORTANCE OF COOKING FOOD**

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Food is an integral requirement of human body because it provides energy and insures growth and development. Human being can be classified into two types according to their eating habits. They are:

- (A) Herbivorous- they are vegetarians who thrive upon plants and plant products, milk, butter, curd etc.
- (B) Omnivorous- they eat both plant and animal and their products

So the food people eat need to be transformed into chewable substance so that the body can absorb the nutrients and minerals from it. Human eat food with mouth and the parts that paly important role in ingestion of food are teeth, tongue and esophagus. Some food are easily broken and become digestible, like cucumber, radish, cherry etc. but some needs to be cooked, like potato, brinjal, meat, fish etc. So we can say cooking is an important work that has to be performed before eating too many of the food. Human cook for for many reasons which are benefitted to the body process, which may be :

1. To soften the fibers to hasten and fasten the process of mastication, digestion, absorption or nutrients, assimilation and elimination of the waste. For instance, the hard grains, such as wheat, and the dried vegetables, such as beans, cannot be readily digested unless they are softened by cooking. But while cooking makes such foods more digestible, it renders others more difficult of digestion, as in the case of eggs, the degree of digestibility depending somewhat on the cooking method used and the skill of the cook. An egg in an almost liquid form, or when

only slightly cooked, as a soft-boiled egg, is more easily digested than when it becomes hardened by cooking. Then, too, a properly prepared hard-cooked egg is more digestible than an improperly cooked one, although the degree of hardness may be the same.

2. To make the food soft, tasty and eatable. This is true of such foods as meat, cereals, and many vegetables, which would be very unappetizing if they were eaten raw.
3. To destroy all the harmful microorganisms present in the food. Cooking sterilizes foods either partly or completely. Many foods need partial or complete sterilization for safety. They must be completely sterilized if the germs that produce fermentation or putrefaction and thereby spoil food would be destroyed. This is done when fruits and vegetables are canned for keeping. Foods that are exposed to dust, flies, and improper handling should be thoroughly cooked in order to destroy any pathogenic germs that might be present. By such germs are meant disease-bearing germs. They differ from germs that produce fermentation and putrefaction, or spoiling, and that must in general be considered as a help, for these play an important part in the raising of bread and the preparation of various foods, as is pointed out later.
4. Cooking develops flavor in many foods. In the case of some vegetables, the flavoring substance is given off in the air by certain methods of cooking and a better flavor is thereby developed.
5. To change the characteristics of certain enzymes and minerals to more usable form.
6. To introduce new variety and taste. The same food may be cooked by various methods and be given very different tastes and appearances; on the other hand, it may be combined with a large number of other foods, so as to increase the variety of the dishes in which it is used. The large number of recipes found in cook books shows the attempts that have been made to obtain variety in cooked dishes by the combining of different foods.
7. To fortify with new nutrients. For example salt is added to food because salt has iodine in it, so food is fortified with iodine. Some readymade foods like honey, jams, and jellies are fortified with minerals by the process of cooking.
8. Delays spoilage - enzymes which cause natural spoilage are destroyed at 60°C as they are protein in nature.

### TYPES OF TASTE

Animals, specifically humans, have five different types of tastes: sweet, sour, salty, bitter, and umami. As animals have evolved, the tastes that provide the most energy (sugar and fats) are the most pleasant to eat while others, such as bitter, are not enjoyable. Water, while important for survival, has no taste. Fats, on the other hand, especially saturated fats, are thicker and rich and are thus considered more enjoyable to eat.

**Sweet:** Generally regarded as the most pleasant taste, sweetness is almost always caused by a type of simple sugar such as glucose or fructose, or disaccharides such as sucrose, a molecule combining glucose and fructose. Complex carbohydrates are long chains and thus do not have the sweet taste. Artificial sweeteners such as sucralose are used to mimic the sugar molecule, creating the sensation of sweet, without the calories. Other types of

sugar include raw sugar, which is known for its amber color, as it is unprocessed. As sugar is vital for energy and survival, the taste of sugar is pleasant. The stevia plant contains a compound known as steviol which, when extracted, has 300 times the sweetness of sugar while having minimal impact on blood sugar.

**Sour:** Sourness is caused by the taste of acids, such as vinegar in alcoholic beverages. Sour foods include citrus, specifically lemons, limes, and to a lesser degree oranges. Sour is evolutionarily significant as it is a sign for a food that may have gone rancid due to bacteria. Many foods, however, are slightly acidic, and help stimulate the taste buds and enhance flavor.

**Salty:** Saltiness is the taste of alkali metal ions such as sodium and potassium. It is found in almost every food in low to moderate proportions to enhance flavor, although to eat pure salt is regarded as highly unpleasant. There are many different types of salt, with each having a different degree of saltiness, including sea salt, fleur de sel, kosher salt, mined salt, and grey salt. Other than enhancing flavor, its significance is that the body needs and maintains a delicate electrolyte balance, which is the kidney's function. Some canned foods, notably soups or packaged broths, tend to be high in salt as a means of preserving the food longer. Historically speaking, salt has been used as a meat preservative as salt promotes water excretion, thus working as a preservative. Similarly, dried foods also promote food safety.

**Bitter:** Bitterness is a sensation often considered unpleasant characterized by having a sharp, pungent taste. Dark, unsweetened chocolate, caffeine, lemon rind, and some types of fruit are known to be bitter.

**Umami:** Umami, the Japanese word for delicious, is the least known in Western popular culture, but has a long tradition in Asian cuisine. Umami is the taste of glutamates, especially monosodium glutamate or MSG. It is characterized as savory, meaty, and rich in flavor. Salmon and mushrooms are foods high in umami. Meat and other animal byproducts are described as having this taste.

## TYPES OF TEXTURE

Texture is described as the characteristic of prepared food, which purely depends in the order of preparation, their mixing, cooking, stirring and serving. A correct texture has to be brought about in the food. The chef should not only know the correct texture, but should be able to produce the same in the food. The various textures which are listed down, are difficult to explain in words, they should be felt and understood better. There are very thin differences between some of these, which one should learn better during practical. A food can have the following textures:

1. **Firm and close** – biscuits and plain short pastries can explain this texture. Raising agents are used while preparing these, but they do not make the product very light or brittle. In fact they are hard as a result of many tiny air bubbles created by raising agents. But the biscuits are not too hard either, because of the fat included.
2. **Short and crumbly** – nankhatai and tarts are good examples of this texture. Fat included is more than that in biscuits, so it breaks more easily into smaller particles.

3. **Spongy** – Swiss rolls, sponge cakes, idli and dhokla are spongy. A soft, elastic texture due to incorporation of more air results in this texture.
4. **Light** – Madeira cake has plenty large holes in it, making it 'light'. It is firm, but not hard and tough. It is neither as short as a tart nor as spongy as a Swiss roll.
5. **Flaky** – chiroti, lacchha paratha, chicken or veg puffs and khara biscuits are flaky. Thin, crisp layers are formed by spreading fat in between two layers of dough which get separated during baking / frying and remain separated due to air pockets. The flakes by themselves should not be tough / hard. Ideally the layers break easily and melt in the mouth.
6. **Coarse** – large and uneven holes are a result of too much of the raising agent or too little liquid. This is not a good texture to have in food; in fact, it is something to be avoided. Such cakes and other products are sunken at the centre.
7. **Tough** – too much liquid, over mixing, incorrect mixing, too little fat and long cooking time could result in toughness in food. Mostly, like the coarse texture, this also is to be avoided.
8. **Hard** – another texture which should be avoided as far as possible. In fact, it is considered to be a fault in the product. Too much pressure while mixing, excessive liquid in the product and incorrect quantity of fat result in this texture. Air that is incorporated gets removed out of the mixture, making the final product hard.
9. **Light and smooth**- With plenty of holes and fairly even size- neither too flaky nor too tough. E.g. Madeira cake, soufflé, custards.

**TYPES OF CONSISTENCIES:** Like different textures found in solid foods (which are mentioned above), different 'consistencies' are found in liquid foods. Some substances flow readily, others resist flow and some require force or weight application to start flow. The concept of consistency is closely related to viscosity.

Factors affecting consistency of liquid are –

- Concentration (of thickening agent)
- Temperature
- Degree of dispersion
- Mechanical treatment
- Time (how long is it after preparing)

Generally speaking, the following consistencies could be found in liquid foods –

- a. **Pouring** – like water and milk. These do not show any resistance and flow easily /readily. Stocks and some thin soups like consommé are examples of 'cooked' liquids having pouring consistency.
- b. **Coating** – when a starchy thickening agent is mixed with a liquid, and the mixture is heated, the starch gelatinizes. In case of a protein as a thickening agent, it coagulates when exposed to heat. In both these cases, the liquid starts to thicken. If a spoon is dipped in this mixture, it starts coating the spoon. A thin film of the mixture could be seen in the beginning. Later on it goes on becoming visibly thicker. Depending upon one / more factors listed before, the thickening will take place up to a certain point. While making basic custard, this will be understood better. Here, liquid is milk and thickening is egg yolk. Similar coating consistency could be observed in kadhi where liquid is buttermilk and thickening is gram flour (besan) The liquid is proportionately more than the flour or thickening agent.

- c. Dropping – when a liquid is added to dry flour, it forms lumps as only some flour (granules) gets combined with liquid. Later, when added more liquid, it converts into dough and with some more liquid, it turns into ‘batter’. Here, the amount of solid (flour) is more than the liquid. For example, a cake mixture of fat, sugar, egg and flour is moistened with water or milk. Only that much liquid is required which will make the mixture fall out in a big moist smooth lump. The liquid should be dispersed well to get a smooth mixture. When you make cake batter in the bakery class, you will understand it better. Also, next time when you are waiting for your (batata) vada-pav, don’t forget to observe the vender making and using the batter.

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## 1.9 PRINCIPLES OF BALANCED DIET

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Food has been a basic part of our existence. Life cannot exist without food. After air and water, food is the utmost important thing for survival. There is no other habit, practice or factor that influences the health of an individual, as much as the kind and amount of food consumed. Through, the centuries, food has also been used, as an expression of love, friendship and social acceptance. Food refers to anything, which nourishes the body. It would include solids, semi-solids, and liquids which can be consumed and which help to sustain body and keep it healthy. Food is a substance which after ingestion, digestion and absorption is capable being utilized by the body for its various functions.

Ingestion- means intake of food. It is intake of a substance which should be chewable, palatable and should enter the gastrointestinal tract. After ingestion, food undergoes a process of digestion. Digestion is a process by which complex substance in food is broken down into simpler substance, which the body can take in and use. Some of this complex substance such as carbohydrates, protein and fats undergo some change during digestion. The end products of digestion or the nutrients present in the small intestine can be used by the body only when they enter these blood stream. This process of movement of digested food or nutrients from the small intestinal wall to the blood stream is termed as absorption of food.

Food supplies nutrients to the body, which help us to maintain our nutritional status and health. For example, apple can be classified, as food, as it is capable, of being ingested, digested and finally supplies nutrients to the body after being absorbed. These materials help the body in carrying out the day today activities and thus maintain health.

The nutrients provided by food are carbohydrates, protein, fats, minerals, vitamins, and water and these performs various functions in the body for maintaining our health. Apart from performing this major function, food has another function also. Now let’s talk about those functions:

### Functions of food

The functions of food can be broadly classified into three main categories.

- 1) Physiological functions of food.
- 2) Psychological functions of food.

3) Social function of food.

1) **Physiological functions of food** - The physiological functions of food can be further sub-divided as follow:

- a. Energy giving.
- b. Body building.
- c. Regulatory and protecting functions of food.

a) **Energy giving:** The body needs a constant supply of energy to carry out the involuntary processes of which we are not even aware, like, respiration, circulation of blood etc. which are essential for continuance of life. Energy is also required to carry out voluntary activities like professional, household and recreational activities, which every human being indulges in like, either jumping, walking, playing etc. Besides this some amount of energy is also required to convert the ingested food into usable nutrients in the body and the heat released during this process helps to keep the body warm. Energy is mainly provided to our body through carbohydrates and fats in the food. Rich sources of carbohydrates are cereals, sugar, jiggery, potatoes, honey etc. Good Sources of fats include ghee, oil, nuts etc. A major part of our daily diet is constituted by these energy-rich food materials.

b) **Body Building:** The foods we eat become a part of us. Thus one of the most important functions of food is that of building the body. A newborn body weighting 2.7-3.2 kg can grow to its potential adult size of 55-70 Kg., if right kinds and amounts are eaten from birth to adulthood, in adult life, the food eaten each day helps to maintain the structure of the adult body, and to replace worn out cells of the body. Building of new tissues is very important particularly for the growing children and pregnant women. There is also a continuous breakdown of old tissues and building up of new tissues going on in our body at all ages irrespective of the apparent growth, thus maintaining a need for body building nutrients. For the body building purposes, the major nutrients utilized are proteins and minerals. Proteins are mainly provided through milk and milk products, meat, fish, poultry, nuts, soybean, and pulses etc.

c) **Regulatory and Protective function:** The third physiological function of food is to regulate the activities of the body. It includes regulation of such varied activities as beating of the heart, maintenance of body temperature, muscle contraction, control of water balance, clotting of blood, removal of waste products from the body etc. For any of these processes, one or the other nutrients is responsible. For example Vitamins of the B groups are an integral part of the enzymes and are responsible for metabolizing food and thus release energy. Vitamin K is an essential factor in clotting of blood. Apart from regulating our body processes, food also protects us from various infections, diseases, and injuries. For example, Consumption of Vitamin A and Vitamin C rich food help in building resistance in the body to fight against invading organism.

The main nutrients which perform these functions include proteins, vitamins, minerals, water and roughage. Although these nutrients are required by the body in very small amounts, yet it is very important for them to be present in our daily diets. The major

sources of these protective and regulatory nutrients are green leafy vegetable, milk, fresh fruits and vegetable, fish etc.

2) **The Psychological Functions of food** - The second major function of food is the psychological function. Food must also satisfy certain emotional needs. These include sense of security, love and attention. Everyone grows in a particular culture with its own unique food habits of that culture and caste. The person begins to associate the food habits and foods commonly consumed by him, as it gives him a sense of security and satiety. The foods daily eaten by us, give us more mental satisfaction, even a nutritional balanced meal may not be satisfying to the individual, if food include is unfamiliar or distasteful to him/her. In a friendly gathering, one may try unfamiliar foods and thus enlarge our food experiences. During the course of time and repeated experience, strange foods become familiar and new tastes are formed. These new taste are developed should again be satisfying to the mind. For example, a person accustomed to traditional Indian cuisine, takes time to adjust to Chinese or western dishes, but feels mentally satisfied at the site of familiar foods.

3) **Social function of Food** - Food and eating has significant social meaning. Share food with any other person implies social acceptance. When you share a meal with anyone else, you are expressing your acceptance of friendship and respect for that person. Earlier only persons enjoying equal status in society eat together. A person would never share a meal with someone inferior to him in social terms. Food is also a symbol of our social life. Food is a medium through which we express our happiness. For example, feasts are given at specific states of life, such as birth, mundane ceremony, birthday, marriage etc. Sweets are also distributed and exchanged to mark certain auspicious occasion like festivals. Food is the common link in a meeting, party or get-together that attracts people to come to such social gatherings. Refreshment served even at officials meeting creates a relaxed atmosphere, where people can exchange their views. The menu for such get-together should bring the people together, rather than divide them. Foods help to strengthen mutual friendship.

For example, inviting friends and relatives over meals signify acquaintance and hospitality. Food also has a specific significance and meaning in the religious context. Certain food items such as fruits, sweets, and coconut are offered to the deity in temples. Often sweets are prepared at temples and gurudwaras and distributed to devotee as a benediction or prasad. Further, people of a given religious community share a common eating pattern. This is because religious texts and practices strongly recommend some foods while rejecting others. Food thus becomes an integral part of the social and religious life of people.

Thus it can be concluded that food performs various important functions from satisfying hunger to building mutual understanding and above all helps to maintain our health and adequate nutritional status.

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### **1.9.1 FOOD GROUPS**

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To get maximum benefit from food, so that it performs all its functions it is important that we take a diet containing all the nutrients in adequate amounts. It is often

seen that most foodstuffs contain some nutrients in either more or lesser amounts than required. Thus, to be able to obtain all the nutrients and in adequate amounts, it is important to include different types of foodstuffs in our diet. On the other hand, it is also not possible to include, all the foodstuffs in our diet at one time. Therefore, to overcome this problem, food items providing same types of nutrients have been grouped together, termed as a 'Food Group'.

Food groups have been formed according to various methods from time to time. ICMR (1989) has classified the different foods items into five food groups, as follow:

1. Cereal, roots and tubers
2. Pulses, nuts, and oil seeds
3. Milk, meat and their products
4. Fruits and vegetables
5. Fat and oils, sugar and jaggery

In this classification, the foodstuffs providing similar nutrients have been grouped together. The five food groups together with their nutrients contribution is given in Figure 1 D.

1. **Cereals, Roots, and Tubers** - group has been further subdivided into two:

**Cereals and Cereals products:** The foodstuffs included in this group are rice, jawar, bajara, maize, bread, maida, etc. These food items are rich sources of energy and, thus provide energy to the body. Cereals are an integral part of our diet on some form or other. Cereals are the cheapest source of energy. In addition to carbohydrates, they also contain some amounts of proteins and as cereals constitute a major part of our daily diet, ample amounts of proteins are derived from them. However, cereals are poor in lysine and rich in methionine, pulses are poor in methionine and rich in lysine, when cereals are mixed with pulses in the same meal then the quality of protein improves through mutual supplementation.





Cereals are also a good source of B-group vitamins, provided one consumes whole grain cereals, as most of B-group vitamins are present in the outer layer of the cereals. These vitamins are thus absent in refined cereals such as maida etc. Whole grain cereal is also a good source of mineral iron, bajra, being the richest among all. Ragi is the only cereal, which contains appreciate amounts of calcium. Cereals are lacking in Vitamin A and C. Both germination and fermentation of cereals significantly increase the B-group vitamins and vitamins C contents.

- **Starchy roots and tubers:** Like potatoes, sweet potatoes, jam, colocasia, tapioca etc. mainly provide carbohydrates and are thus grouped along with cereals under energy giving foods. These food items do not provide protein, as do cereals. Therefore it is not advisable to use them in place of cereals to provide energy for a very long time. These roots and tubers, can however, be used along with cereals in providing energy.

**2) Pulses, Nuts and Oil seeds:** This food groups include various pulses and legumes, like green gram, black gram beans, etc. Nuts and oil seeds like groundnuts, sesame are included in this group. The foodstuffs from this food group provide major portion of protein for vegetarians as pulses are very good source of proteins. The proteins from these sources are also second-class proteins. Pulse lack in essential amino acid, methionine and rich in lysine. On the other hand, cereals are lacking in essential amino and lystine and rich in methionine. Therefore when cereals and pulses are combined together, the quality of protein improves through mutual supplementation. Hence, cereal–pulse combination as in dosa, dal-roti and rice-dal are good practice in Indian homes. Pulses are also good sources of vitamins and minerals. They contain appreciable amounts of B groups of vitamins, especially thiamine.

Pulses do not contain vitamin C, however, on sprouting they became a very good source of this vitamin also. In general pulses are good sources of iron and on sprouting the availing of iron increased further. Apart from proteins, nuts also contain a high amount of fat; therefore they are good sources of energy also. Oil seeds like groundnuts, till, mustard, and sunflower seeds etc. also have good amounts of proteins. The oil cake or meal left after the extraction of oils is rather a very good source of proteins. This oil cake should be incorporated in the diets in combination with other protein food to improve protein utilization.

**3) Milk, Meat and their products** - The foodstuffs included in this food groups are:

- i) Milk and milk products.
- ii) Eggs, meat fish, poultry etc.

All these foodstuffs provide us with first class proteins i.e. their protein contain all the essential amino acids, in adequate amounts. The food items from this group thus help in body building and maintenance processes.

i) **Milk and its products:** Milk and its products like cheese, curds, are very good source of good quality proteins. Along with proteins milk also provides us with calcium and phosphorous, vitamin A and riboflavin. Milk is a very important food for growing children, as it provides them with good quality proteins and they are also able to digest it.

For small infants this is the only food, which is easily digested and assimilated in the body.

ii) Eggs, meat, fish and chicken: These are also excellent sources of first class protein, which can be totally utilized in our body for building the body. They also contain B-group vitamins in good amounts. Among, this liver is very good source of vitamin A and vitamin B12. Eggs contain nearly all the nutrients, but are particularly good source of protein, fats, vitamin A, iron., calcium and phosphorus.

**4) Fruits and Vegetables** - This food includes fresh vegetables and fruits which provide protective nutrients to our body i.e. vitamins and minerals. The foodstuffs included in this group are spinach, methi, cabbage, cauliflower, carrot, papaya, mango, apple, tomato, lemon, orange, guava, amla etc.

Green leafy vegetables and orange and yellow coloured fruits and vegetables provide us mainly with carotenes.(precursor of vitamin A) vitamin C is found in citrus fresh fruits. Vitamin B group is also present in green leafy vegetables. Some fruits like peaches, pineapple and vegetables like fenugreek, mustard leaves, horse gram leaves are exceptionally good sources of iron. Calcium is basically furnished by green leafy vegetables.

Fruits and vegetables also provide dietary fibre to our meals. The fibrous tissues, which are not digested, help to move the food through the digestive tract and regulate excretion of body wastes.

**5) Fats and Oils, Sugar and Jaggery** - Fats and oils like vegetable oils; hydrogenated fats and pure ghee are very concentrated sources of energy providing 9 Kcal./g. They are mainly used as the cooking medium and hence do form a necessary part of the diet. Fats and oils help to increase the palatability of our food.

Sugar, jaggery and honey supplies energy in the form of carbohydrates. These food items provide about 4 Kcal/g. Sugar is the main source of energy in the form of carbohydrate. Apart, from providing carbohydrates, jaggery is also a good source of iron.

Although, most of the food items are covered under these five food groups, but still some widely used food items are uncovered. Condiments and spices are also used in our diets which are mainly added to make the food tasty and appealing. Though they contain significant amounts of certain nutrients, but since these are used in very small quantities, they do not contribute much to the nutritive value of the diet.

The ICMR classification is based on grouping foodstuffs according to the similarity in nutrients found in them. To incorporate the goodness of all the food groups in one's diet, one must choose some foodstuffs out of the two energy giving food groups i.e. cereals, roots, and tubers, and fat, oil and sugar and some food items out of either pulses or meats for body building purpose. The fruits and vegetables however are a must in every meal. Thus, some items from the energy giving food groups, bodybuilding food groups and protective food group must be incorporated in every meal.

For ease in planning diets and for the sake of simplicity and remembrance, the food groups have also been divided according to their functions. Thus on the basis of three physiological functions of food, food items have been grouped into three food groups as follows:-

- 1) Energy giving food groups
  - 2) Body building food groups
  - 3) Protective and regulatory food groups.
- 1) Energy giving food groups: The food stuffs included in this food groups are cereals, like wheat, rice, bajra, jawar, etc. roots and tubers like potato, colocasia, and sugar, jaggery, ghee oil, butter etc. All these foodstuffs are either rich sources of carbohydrates of fats and provide us with energy. These foodstuffs give the strength to carry on the various days to-day activities.
  - 2) Body building foodstuffs: The food items included in this food groups are milk and its products, meat, fish, pulses, nuts, soyabeans, etc. The food from this group mainly provide us with proteins and some vitamins and minerals to aid in the growth of the body and for the maintenance of the body by repair of worn out tissues.
  - 3) Body protective and regulatory foodstuffs: The food items included in this group are fruits, green vegetables and other vegetables.

The nutrients derived from these foodstuffs are vitamins and minerals. These nutrients help us to fight against disease and infections. Vitamins and minerals also aid in the regulation of various body processes. If some food items from the three functional food groups are included in each meal, then our meal becomes a complete meal. To make our meals complete, it is not necessary to go in for elaborate menus, but by simple and judicious selection of menus, we can achieve a complete and balanced meal, e.g. incorporation of any vegetable in paranathas and having them with curds. A more time saving option would be roti i.e. cereal pulse combination, along with some green leafy vegetables or any other vegetables. Other example of complete meals include roti, dal and subji, sambar–idly as sambar usually contains some vegetables, vegetables palao with curd, cheese and vegetables sandwiches etc.

**Balanced diet:** Balanced diet can be defined as “ the one which contains different types of foods in such quantities and proportions that the need for all the nutrients are adequately met and a small extra provision is made for nutrients as a margin of safety”. Thus, our meals will only be said to be adequate and balanced when the quantity of food consumed is sufficient to meet our daily requirements, plus there is an allowance to be stored in the body to be used in conditions of stress. When a person due to some reasons, is not able to consume the required amount of nutrients, like in fever or fasting, then the body stores of these nutrients are utilized. The quantity of our meals can be improved or is said to be optimum when our diets are complete. Every meal should have foodstuffs providing energy, protein, and vitamins, and minerals. The component of a balanced diet will , however differ according to age, sex, physical activity, economic status and physical state of human being, which shall be discussed in detail in the next chapter.

However, as an example a day's diet for an adult man belonging to middle income group is given below.

According to ICMR, the following guidelines are suggested for maintaining a healthful diet. It should be noted these are only general recommendations for people who are already healthy and want to stay that way. They are not necessarily for those who need special diets because of disease or other abnormal conditions.

1. **Get adequate nutrients within calorie needs:** The greater the variety of nutrient-dense foods and beverages within and among the basic food groups we consume, the more likely we are to get all the nutrients we need. Choosing nutrient-dense foods and avoiding empty calories is necessary in order for us to get adequate nutrition without consuming too many calories in the process. Choose foods that limit the intake of saturated and trans fats, cholesterol, added sugars, salt, and alcohol
2. **Manage weight:** To maintain a healthy body weight, balance the calories you consume with the calories you burn. People who are greatly overweight are more likely to develop certain chronic diseases, including high blood pressure, heart disease, and stroke. People who consume more calories than they burn off will gain weight. To prevent gradual weight gain, make small decreases in the calories you consume and increase your physical activity. Rather than depending on crash diets, it is usually better to lose weight slowly and gradually, to develop better habits of eating, and to increase physical activity. To get all the nutrients you need while cutting down on calories, decrease foods that are high in calories but low in nutrients, especially fat and fatty foods, sugar and sweets, and alcohol.
3. **Engage in physical activity:** Engaging in regular physical activity promotes health, psychological wellbeing, and a healthy body weight. For general health and reducing the risk of chronic diseases, getting at least 30 minutes of moderately vigorous exercise every day is desirable, and more and longer vigorous exercise can be even more beneficial. In order to avoid gaining weight, adults should try to get 60 minutes of exercise most days while at the same time not consuming too many calories. People who wish to lose weight gradually should try to get 60 to 90 minutes of exercise most days, again while limiting calorie intake.
4. **Select from the right food groups:** Fruits, vegetables, whole grains, and low-fat or fat-free milk and milk products are the foods with the highest nutrient density. These foods should be strongly emphasized in a healthy diet. In particular, someone who consumes 2,000 calories a day should try to eat the following daily:
  - 2 cups (4 servings) fruit, selecting from a variety of fruits
  - 3 cups (6 servings) vegetables, selected from as many of the basic vegetable groups as possible: dark green vegetables, orange vegetables, legumes, starchy vegetables, and others
  - 8 servings of whole grains
  - 3 cups of fat-free or low-fat milk or its equivalent in other dairy products, such as yogurt and cheese

5. **Manage consumption of fats:** Keep total fat intake between 20 and 35 percent of calories with most fats coming from sources of polyunsaturated and monounsaturated fatty acids, such as fish, nuts, and vegetable oils. This means for a diet of 2,000 calories daily, calories from fat should be between 400 and 700. Why not lower than 20 percent? Remember that some fatty acids are essential nutrients, and fats also carry fat-soluble vitamins. Consuming less fat than 20 percent of daily calories could be unhealthy.

- Keep consumption of saturated fats, especially trans fats, as low as possible.
- Consume less than 10 percent of calories from saturated fatty acids.
- Consume less than 300 milligrams cholesterol per day.
- When selecting and preparing meat, poultry, dry beans, and milk or milk products, make choices that are lean, low-fat, or fat-free.

Remember: High fat intake, especially of saturated fats and cholesterol, is associated with such conditions as heart disease and high blood pressure. Although other factors contribute to these diseases, such as heredity and smoking, following this dietary recommendation should increase the chances of staying healthy.

6. **Manage consumption of carbohydrates:** Choose fiber-rich fruits, vegetables, and whole grains. These foods are the sources of the most healthful carbohydrates. Avoid prepared foods high in added sugars. Reducing refined sugars and starches in the diet has the added benefit of helping reduce tooth decay.

7. **Manage consumption of sodium and potassium:** Consume less than 2,300 milligrams (about 1 teaspoon or 5 milliliters salt) sodium per day. Sodium, as noted earlier, appears to contribute to high blood pressure. For people who already have high blood pressure, it is especially important to reduce sodium in the diet. The best ways to do this are to decrease the use of salt in the kitchen and at the table and to limit the intake of prepared foods that are high in salt, such as potato chips, salted nuts, pretzels, pickled foods, cured meats, and salty condiments like soy sauce. Reduce the harmful effects of sodium by eating potassium-rich foods, such as fruits and vegetables.

8. **Manage consumption of alcoholic beverages:** People who choose to drink alcoholic beverages should do so sensibly and in moderation- defined as the consumption of up to one drink per day for women and up to two drinks per day for men. Alcoholic beverages are high in calories but provide few nutrients. Heavy drinking may cause a variety of serious diseases. Moderate drinking- one or two drinks a day- appears to do little harm and may, in fact, be of some benefit.

Many people, including children and adolescents, pregnant and lactating women, people taking medications that interact with alcohol, and people with certain medical conditions, should avoid alcohol completely. In addition, alcoholic beverages should be avoided by people engaging in activities that require attention, skill, or coordination, such as driving or operating machinery.

**Cooking Healthful Meals:** Restaurateurs and chefs are becoming more and more attentive to people's health and diet concerns. Many of them are reexamining their menus, modifying their cooking practices, and adding new, healthful items to their menus. Some have developed new menus intended to follow as closely as possible the

eight recommendations listed above. An increased health consciousness has affected the way we think about food and the way we cook. Professional cooks are making their foods more healthful in several ways:

1. **Using less fat in cooking:** Cooking methods that require no added fat, such as simmering, poaching, baking, steaming, and grilling, can be considered the most healthful. For sautéing, nonstick pans are becoming more widely used because little or no fat is needed. With regular pans, one can be careful to use as little fat as possible. Grilling is popular because it can be done without first coating the food with fat. If this is done, however, one must be careful not to let the food dry out. Using less fat in cooking also means using ingredients with less fat. Excess external fat can be trimmed from meats and poultry. Low-fat sauces, such as salsas and vegetable purées, can often be used instead of high-fat sauces. Recipes can often be modified to reduce quantities of high-fat ingredients, such as butter, cheese, and bacon.
2. **Using unsaturated fats:** When you do use fats, try to substitute monounsaturated fats, such as olive oil or canola oil, for saturated fats when appropriate.
3. **Emphasizing flavor:** Taste is the most important factor in preparing nutritious food. The most vitamin packed dish does no one any good if it is uneaten because it doesn't taste good. Preparing flavorful foods requires knowledge of the principles of cooking. You can't rely simply on nutritional information. Rely more on the natural flavors of foods and less on salt and other additives that should be decreased in the diet.
4. **Using the freshest, highest-quality foods possible:** In order to prepare delicious foods with little or no added salt and with less reliance on high-fat, high-sodium sauces and condiments, it is important to use high-quality natural ingredients at their peak of flavor. Healthful cooking means letting the true flavors of foods dominate. To enhance natural flavors without added salt, cooks are using more fresh herbs, hot seasonings such as chiles, ginger, and pepper, and flavorful ingredients like garlic, browned onions, and flavored vinegars.
5. **Storing foods properly:** Foods in storage lose nutrients as they age. The loss of nutrients can be slowed, however, by proper storage. This applies particularly to proper refrigeration. For each category of perishable food discussed in this book, pay close attention to how the foods should be stored.
6. **Modifying portion sizes:** It is not necessary to feature huge slabs of meat to serve satisfying meals. Smaller portions of well-trimmed meat, poultry, or fish, nicely balanced on the plate with an assortment of attractive fresh vegetables and complex carbohydrates, are likely to be more healthful. Sauces often get the blame for adding calories to a meal, but if a sauce is flavorful, you don't need much. Make a better sauce and serve less of it. Also, if a sauce isn't too thick, it won't cling as heavily to the food, and a little will go farther.
7. **Giving customers a healthful choice:** Offer a menu with a variety of foods so customers can choose a well-balanced meal suited to their needs and desires. It's not

necessary to cook only “diet food,” but a menu that offers French fries as the only available starch is not well balanced. Place more emphasis on fruits, vegetables, and whole grains. Offer a menu with choices from all the groups in the ICMR food pyramid, with a variety of choices from the bottom half of the pyramid or the outer rings of the rainbow. Be flexible in the kitchen. A good chef is willing to modify menu items to meet dietary requirements and to satisfy special requests from customers.

8. **Training the dining room staff:** Some restaurants offer special “spa menus” in addition to their regular menus, or they highlight “healthy” items with a special symbol. Unfortunately, this approach may suggest to some people that the highlighted menu items are boring “health food,” while the other menu items are unhealthful because they aren’t flagged. Consequently, many chefs prefer to train their dining room personnel to answer customers’ questions about the menu and to offer suggestions when asked.
9. **Using nutritional information:** Study the nutritional content of foods in order to plan healthful menus. Many publications are available that list the nutritional content of common food items. Some restaurants have even hired registered dietitians to analyze their menus and give advice on how to make their food more healthful.

Hiring a dietitian is, of course, not practical for every operation. On the other hand, a basic awareness of nutrition helps every professional minimize the fat, cholesterol, and sodium in and maximize the nutritional content and balance of the foods they serve.

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### 1.10 ACTION OF HEAT ON FOOD

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**Action of heat on carbohydrates:** Carbohydrates come in basically two forms- sugar and starch, and each form reacts differently when exposed to heat. When exposed to heat, *sugar* will at first melt into thick syrup. As the temperature continues to rise, the sugar syrup changes color, from clear to light yellow to a progressively deepening brown. This browning process is called *caramelization*. It is a complicated chemical reaction, and in addition to color change, it also causes the flavor of the sugar to evolve and take on the rich complexity that we know to be characteristic of caramel. Different types of sugar caramelize at different temperatures. Granulated white sugar melts at 320°F/160°C and begins to caramelize at 338°F/170°C.

**Starch-** a complex carbohydrate has powerful thickening properties. When starch is combined with water or another liquid and heated, individual starch granules absorb the liquid and swell. This process, known as *gelatinization*, is what causes the liquid to thicken. Gelatinization occurs at different temperatures for different types of starch. As a general rule of thumb, root-based starches (potato and arrowroot, for instance) thicken at lower temperatures but break down more quickly, whereas cereal-based starches (corn and wheat, for example) thicken at higher temperatures but break down more slowly.

In foods that are not primarily sugar or starch, a different reaction, known as the *Maillard reaction*, is responsible for browning. This reaction involves sugars and amino

acids (the building blocks of protein). When heated, these components react and produce numerous chemical by-products, resulting in a brown color and intense flavor and aroma. It is this reaction that gives coffee, chocolate, baked goods, dark beer, and roasted meats and nuts much of their rich flavor and color. Both caramelization and the Maillard reaction typically require relatively high heat (above 300°F/149°C) to occur rapidly enough to make an appreciable difference in foods. Because water cannot be heated above 212°F/100°C unless it is under pressure, foods cooked with moist heat (boiling, steaming, poaching, and stewing) will not brown. Foods cooked using dry-heat methods (sautéing, grilling, or roasting) will brown.

**Action of heat on fats:** Fat is not changed, except at a very high temperature, 500° F (260 deg.C) and over, when it is broken apart - "split" - into fatty acid and glycerine. Some of the glycerine is changed to "acrolein," which is very irritating to the mucus membrane, as is recognized by the smarting sensation given to the eyes and nose when fats are heated too hot. Butter begins to "split" at 374 ° F, lard at 446 ° F, and olive oil at 630° F. Fats and oils give a rich flavor and texture to food and make it crispy. It also increases the energy value of food.

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

**Action of heat on proteins:** Whenever you cook food, the heat first breaks and then "unfolds" the proteins molecules within. Protein molecules are long chains of 100 or more amino acids all linked together that usually form a coil called an alpha helix.

When the molecules of protein in food are "stressed" by the heat of cooking, it begins to "uncoil" and changes, losing or altering some of its properties, the process is called *protein denaturing*. There are physical and chemical changes to the structure of the protein as it is being cooked, some of which are beneficial and others that are not. All proteins first denatures and then coagulates. The temperature of coagulation occurs between 65-90 deg.C. Coagulation means curdling, formation of mass, congealing or solidifying.

Overcooking creates chemical changes that can alter or destroy protein in plant and animal tissue. Excess heat breaks down proteins, causing them to lose essential amino acids and up to 50 percent of their vitamins and minerals. Also, the higher the temperature, the more cancer-causing chemicals are produced. Meat, fish and poultry cooked on a gas grill create nitrosamines, which are *carcinogens*. Sizzling fat on a grill also generates carcinogens, such as nitrosamines, hydrocarbons and benzopyrene. When meat is charred, polycyclic hydrocarbons and free radicals are created. Instead of frying or grilling, try baking meat and chicken and poaching fish or steaming it in parchment. Cooking methods using a steady medium temperature over a longer period of time also helps keep proteins in meat, chicken or fish more viable and cancer-causing chemicals to a minimum. Lightly steaming vegetables will ensure that their proteins (and other nutrients and fiber) remain at their best.

**Action of heat on minerals:** All minerals are stable to heat application directly, only they



tend to oxidize due to the presence of moisture.

**Action of heat on vitamins:** Vitamin loss can be induced by a number of factors. Obviously, losses of vitamins depend on cooking time, temperature, and cooking method. Some vitamins are quite heat-stable, whereas others are heat-labile. All vitamins except Vitamin C are fairly resistant to heat application.

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### 1.10.1 EFFECTS OF COOKING ON DIFFERENT TYPES OF INGREDIENTS

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**Cereals:** Rice is washed before cooking. Excessive washing removes the water-soluble vitamins and mineral. The practice 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.

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### CHECK YOUR PROGRESS-II

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Q. 1 What are the bread specialties of Italy?

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Q2. What are the categories into which Chinese cooking broadly classified?

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Q3. Define balanced diet?

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## 1.11 SUMMARY

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The chapter has aimed to make one understand the existence of the art of cookery in the ancient ages from African to Roman and finally to the entire world. The transformation from lavish dinners to small ones without changing the mood of the people. The modern practice of nouvelle cuisine brought about immense transformation in the style of food production and service. Apart from this the modernization and sophistication in the equipments has brought every cuisine at the door-step. Popular

dishes of every country are easily available everywhere. What does ‘cooking’ mean? Can cucumbers and salads be called ‘cooked foods’? Cooking means exposing food materials to heat. The medium of transfer of heat from its source could be water, air or oil. This will be dealt with in detail at a later stage. First let us understand why we need to ‘cook’ food. Today we do eat some food in the uncooked (raw) form; though, mostly we associate food with its cooked form. Cooking style is somewhat different from one country to another, but the method remains the same. Boiling, frying, simmering, broiling and steaming are practiced in every culture so that the people can get the maximum minerals and vitamins from the food.

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## 1.12 GLOSSARY

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1. **ICMR**- Indian council for medical research- the supreme body in India which defines the nutritional status of its people.
2. **Vatel**- first victim of cookery – who committed suicide when the fish delivery for the king Louis XIV ‘s banquet did not arrive in time.
3. **Nouvelle cuisine**- the modern and simplified cuisine developed by P and J. Troisgros (2 brothers) M. Guerard, A. Chapel, R. Verge and Bocuse.
4. **Antipasta**- the Italian word for appetizer or starters.
5. **Gnoolchi**- Italian dumpling made of potato and cheese
6. **Polenta**- a Italian dish similar to rice preparation made from millet, buckwheat, chickpeas or broad beans.
7. **Wok**- Chinese kadai- used for cooking.
8. **Dim-sum**- Chinese tid-bits
9. **Cleaver**- Chinese cutting tool which has broad face and with a handle.
10. **Unami**- it is the Japanese word for delicious.
11. **Balanced diet**- Balanced diet can be defined as “ the one which contains different types of foods in such quantities and proportions that the need for all the nutrients are adequately met and a small extra provision is made for nutrients as a margin of safety”.
12. **Caramelisation**- browning of sugar.
13. **Gelatinization**- the formation of stickiness by the starch upon heating in presence of moisture.
14. **Maillard reaction**- The browning of carbohydrate
15. **Flash point**- a point when fats and oils are heated, smoke is formed and eventually catches fire.

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## 1.13 CHECK YOUR PROGRESS-I ANSWERS

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1. The foreign influences that transformed the Indian regional cookery are - Persians, Greeks, Romans, Moghuls, Sythian, Psthians, Kushans, Arabs, Turks, Afghans, Jews, French, Portuguese and the British and the Chinese.

2. In India nouvelle cuisine is practiced in In Bombay –Rendez Vous and Menage A Trois -(Taj), Leela Penta (Waterfall café) –Oberoi Rotisserie. In Delhi - TAJ PALACE (Orient Express), HYATT (Valentino).
3. Alexander Dunas, Sir George Augustus Escoffier, Marie-Antoine Careme, A. Chapel and Paul Bocuse.

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## 1.14 CHECK YOUR PROGRESS-II ANSWERS

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1. Bread specialties of Italy are:
  1. Bruschetta : toasted slices of bread with garlic, olive oil and tomato.
  2. Cilindrati : croissants made from thinly rolled bread dough.
  3. Grissini : Bread sticks from Turin.
  4. Crocetta :Hot cross Buns
- 2 Chinese cooking is broadly classified into
  1. Water cooking: Boiling, Poaching, and Simmering
  2. Oil cooking
  3. Fire cooking:- Deep frying, shallow frying, stir frying, braising, roasting, baking and barbecuing.
  4. Steam cooking: Steaming
3. Balanced diet can be defined as “ the one which contains different types of foods in such quantities and proportions that the need for all the nutrients are adequately met and a small extra provision is made for nutrients as a margin of safety”.

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## 1.16 TERMINAL QUESTIONS

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### Short answer type questions:

1. Write a note on the fooding habits of the Romans.
2. What is the role of France in developing cookery?

3. Write short note non Haute cuisine.
4. What is the contribution of Escoffier in Cookery?
5. What are the principles of Nouvelle cuisine?
6. Write a note of the various cheeses found in France.
7. What are the different types of texture food can be classified?
8. Discuss in short the Food groups according to ICMR.

**Write short notes on:**

1. Eating habits of the people in castles
2. French cook book writers
3. West Indian cuisine
4. North Indian cuisine.
5. Szechuan cuisine
6. Caramelization
7. Chinese vegetarian school.
8. Flash point
9. Psychological function of food
10. Different types of consistencies.

**Long answer type questions**

1. Write an essay on how has the culinary history of India influenced by other foreign countries and faiths?
2. Explain why Egypt is known as the birth place of commercial food industry?
3. Why Nouvelle cuisine is considered as landmark in modern development in Food preparation and service?
4. Discuss the Development of gastronomy in modern days.
5. Discuss the role of various equipments used in Chinese cuisine.
6. What the aims and objectives of cooking food? Write in detail.
7. Discuss elaborately the characteristics of Chinese cuisine.
8. What are the different factors on which the eating habits of the people of India depend upon?
9. Explain in detail the principles of Balanced Diet.
10. Discuss in detail the different functions of food.
11. Elaborate the different elements of food group.
12. Discuss how balanced diet can be achieved for well being of human.

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## UNIT-2

# KITCHEN EQUIPMENTS AND HYGIENE

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### STRUCTURE

- 2.1 Introduction
- 2.2 Objective
- 2.3 Different types of Kitchen equipments
  - 2.3.1 Heat generating equipments
  - 2.3.2 Cold generating equipments
  - 2.3.3 Other equipments
  - 2.3.4 Metals and conductivity

Check your progress-I

- 2.4 Maintenance of Kitchen equipments
- 2.5 Selection of kitchen equipments
- 2.6 Personal hygiene
- 2.7 Food handling and storage
- 2.8 Pest control and fumigation
- 2.9 Conversion tables

Check your progress-II

- 2.10 Summary
- 2.11 Glossary
- 2.12 Check your progress-1 answers
- 2.13 Check your progress-2 answers
- 2.14 Reference/bibliography
- 2.15 Terminal question

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## 2.1 INTRODUCTION

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The growth of food industry has created a demand of thousands of skilled workers every year. Moreover due to more economical burden, many hotels are adopting modern equipments. It is important to understand the importance of using the proper tools and equipments when preparing, cooking, storing and presenting food. Many times the quality of the finished product is determined by the tools and equipments used. In addition, the efficiency of the kitchen is impacted by the ability to select the correct tools and use it correctly. This chapter discusses most of the tools and pieces of equipments used in a professional kitchen and how the kitchen should be designed for optimal performance.

Thorough knowledge of equipment is essential for success in the kitchen. Few food service operations depend on nothing more than a range and an oven, an assortment of pots and pans, and knives and other hand tools. Modern technology continues to develop more and more specialized and technically advanced tools to reduce kitchen labour. Much of this equipment is so complex or so sophisticated that only first hand instruction and practice will teach you how to operate it effectively and safely. Other items, especially hand tools, are simple and need no explanation but require much practice to develop good manual skills.

A vast array of specialized equipment is available for today's kitchens. It would take a large book, not just a short chapter, to explain all of the many items you will come in contact with in your career-items such as pasta machines, crepe machines, Greek gyro broilers, doughnut glazers, conveyor fryers, and so on. In this technological age, nearly every year brings new tools to simplify various tasks.

Now we introduce to the most commonly used equipment in food service kitchens. It cannot, in this short space, serve as an operating manual for every model of every machine you will use. It cannot take the place of demonstration by your instructor and of actual experience.

**Your hands are your best tools:** Machines are intended to be labor saving devices. However, the usefulness of specialized processing equipment often depends on the volume of food it handles. It takes less time for a cook to slice a few pounds of onions by hand than to set up a slicing attachment, pass the onion through it, and break down and clean the equipment. This is why it is so important to development good manual skills.

**Food equipment can be dangerous:** Modern cooking and food processing equipment has an extraordinary capacity to burn, cut, smash, mangle, and amputate various parts of the tender human body. This may sound like a harsh way, but the intent is not to intimidate you or scare you but to inspire a healthy respect for the importance of proper safety and operating procedures. Never use a piece of equipment until you are thoroughly familiar with its operation and all its features. You must also learn how to know when a machine is not operation correctly. When this happens, shut it down immediately and report the malfunction to a supervisor.

**Not all models are alike:** Each manufacturer introduces slight variations on the basic equipment. While all convection ovens operate on the same basic principles, each model is slightly different, if only in the location of the switches. It is important to study the operating manual supplied with each item or to be broken in by someone who already know that item well and has operated it.

**Cleaning is part of the operating procedure:** Thorough, regular cleaning of all equipment is essential. Most large equipment can be partially disassembled for cleaning. Again, every model is slightly different. Operating manuals should describe these procedures in detail. If a manual is not available, you must get the information from someone who knows the equipment.

**Conserve energy:** At one time, it was standard procedure for the chef to turn on the ovens and ranges first thing in the day and keep them on all days. Today, high energy costs have made such practices very expensive. Fortunately, modern equipment takes less time to heat. Know the preheating time for all your cooking equipment so you do not need to turn it on before its necessary. Plan production so that equipment requires a lot of energy is not on for long period when not in use.

## 2.2 OBJECTIVE

Through this chapter, students will be able to understand the following:

- Classification of kitchen equipments.
- Role and use of each tools and equipments.
- Purchasing of equipments and
- Maintenance of equipments and tools
- Personal hygiene and safety practices required for kitchen professionals

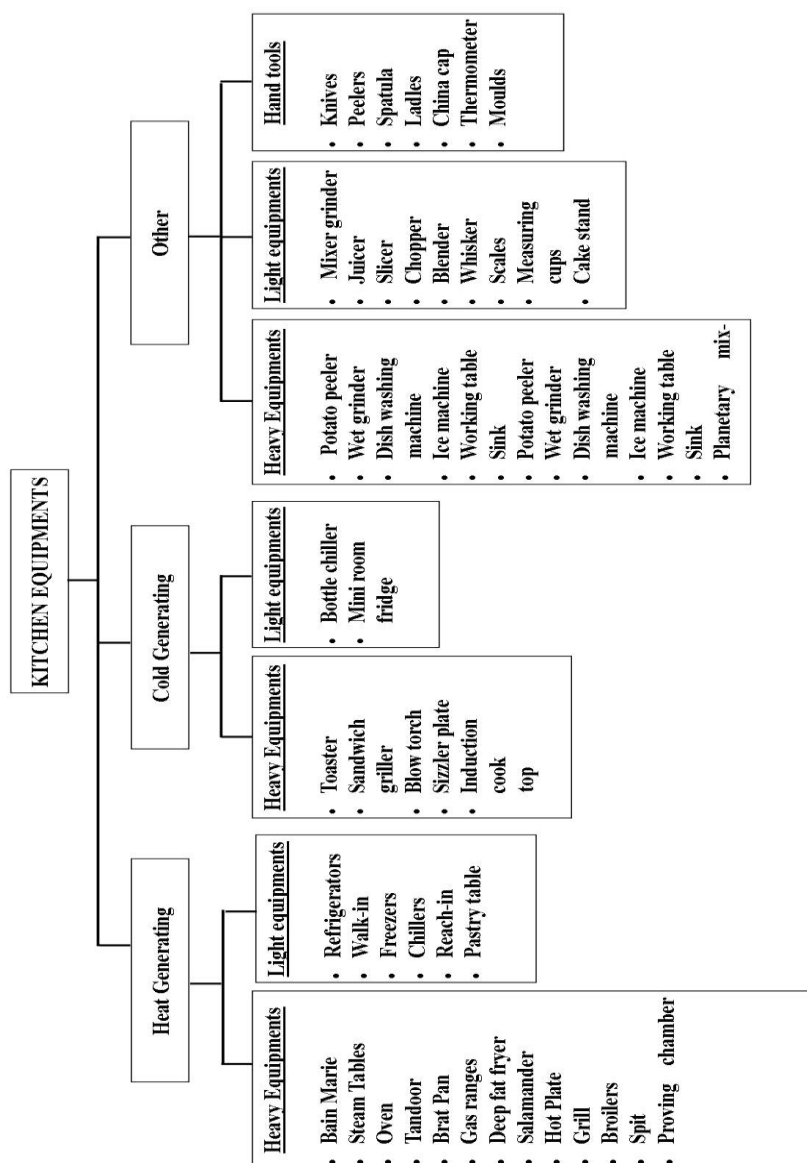


Fig. 2A. CLASSIFICATION OF EQUIPMENTS

## 2.3 DIFFERENT TYPES OF KITCHEN EQUIPMENTS

There are hundreds of kitchen equipments used in food service establishments. These may be classified as follows:

### 2.3.1 HEAT GENERATING EQUIPMENTS:

These equipments produce heat when they are ignited or when they are subjected to heat from other sources. They may be categorized as shown in Fig.2A.



**Heavy Equipments (Fig-2 B):** Heavy equipment includes the gas electric- or steam-operated appliances used for cooking. Reheating or holding foods. It also includes dishwashers and refrigeration units. These items are usually installed in a fixed location determined by the kitchen's traffic flow and space limitations. Heavy equipment may be purchased or leased new or used. Used equipments are most often purchased in an effort to save money. The buyer should also consider the lack of a manufacturer's warranty or dealership guarantee and how the equipment was maintained by the prior owner. Functional used equipment is satisfactory for back-of-the-house areas. But it is usually better to purchase new equipment if it will be visible to the customer. Leasing equipment may be appreciated for some operations. The cost of leasing is less than purchasing and if something goes wrong with the equipment, the operator is generally not responsible for repairs or service charges.

1. **Bain Marie-** is a hot-water bath. Containers of foods are set on a rack in a shallow container of water, which is heated by electricity, gas, or steam. The bain-marie is used more in the production area, while the steam table is used in the service area.
2. **Overhead infrared lamps** - are used in service areas to keep plated food warm before it is picked up by the service staff. They are also used for keeping large roasts warm. Foods dry out quickly under holding lamps. This is a disadvantage for almost all foods except for French fries and other deep-fried foods, which lose their crispness if they are kept moist.
3. **Ovens-** are enclosed spaces in which food is heated and cooked, usually by hot air or, in some newer kinds of ovens, by microwaves or infrared radiation. There are many kinds of ovens beyond those discussed here:
  - a) **Conventional ovens** - operate simply by heating air in an enclosed space. The most common ovens are part of the range unit, although separate oven units or ovens as part of a broiler unit are also available. *Stack ovens* are units that consist of individual shelves or decks arranged one above the other. Pans are placed directly on the oven deck rather than on wire shelves. Temperatures are adjustable for each deck.
  - b) **Convection ovens** - contain fans that circulate the air and distribute the heat rapidly throughout the interior. Because of the forced air, foods cooked more quickly at lower temperatures. Also, shelves can be placed closer together than in conventional ovens without blocking the heat flow.
  - c) **Revolving ovens** - also called reel ovens, are large chambers containing many shelves or trays on an attachment like a Ferris wheel. This oven eliminates the problem of hot spots or uneven baking because the mechanism rotates the foods throughout the oven. Revolving ovens are used in bakeshops and in high-volume operations.
  - d) **Barbecue ovens or smoke ovens** - are like conventional ovens, but are able to produce wood smoke, while surrounding the food and adds flavor while it bakes or roasts. This device is usually nothing more complicated than an electric heating element that heats small blocks or chips of the wood so that they are hot enough to smoke but not hot enough to burst into flame.
  - e) **Microwave ovens** -In these ovens special tubes generate microwave radiation, which creates heat inside the food.

4. **Tandoor-** is igloo shaped clay oven which is run by electricity or gas. It is used in bread making like naan, roti, parantha. It is also used in preparation of roasts like kebabs. These are available in different shapes and sizes.
5. **Brat pan or tilting skillet-** also known as the tilting brazier and tilting fry pan is a versatile and efficient piece of equipment. It can be used as a griddle, fry pan, brazier, stewpot, stockpot, steamer, and bain-marie or steam table. It has a tilting mechanism that enables liquids to be poured out of it. Power may be gas or electric.
6. **Gas Ranges-** are basically topped with gas burners. Normally each table may have 1-6 burners, depending upon the requirement. The burners may be blow type (high pressure) or mushroom type (low pressure).
7. **Deep fat fryer-** is used to cook foods in hot fat. Yet because of the popularity of fried foods, this function is an important one. These are of many types viz: Standard deep fryers are powered by either gas or electricity and have thermostatic controls that maintain fat at present temperatures. Automatic fryers remove food from the fat automatically after a preset time. Pressure fryers are covered fry kettles that fry foods under pressure. Foods cook faster, even at a lower fat temperature.
8. **Hot plate-** or Griddles are flat, smooth, heated surfaces on which food is cooked directly. Dosas, Uttapums, Pancakes, French toast, Hamburgers and other meats, eggs, and potato items are the foods most frequently cooked on a griddle. Griddles are available as separate units or as part of a range top.
9. **Salamanders-** Salamanders are small broilers used primarily for browning or glazing the tops of some items. They may also be used for broiling small quantities during off-peak hours. Salamanders are usually mounted above the range.
10. **Grills -**are used for the same cooking operations as broilers except the heat source is below the grid that hold the food rather than above it. Many people like grilled foods because of their charcoal taste, which is created by smoke from meat fat drips into the heat source. Although smoke from meat creates the taste that the people associates with grilled food, actual woods smoke flavour, such as hickory, mulberry etc can be added to foods if those woods are burned in the grill under the food. In order to do this, you must use a grill designed to burn such fuels.
11. **Broilers -**Broilers times called overhead broilers to avoid confusing them with grills. Overhead broilers generate heat from above, and food items are placed on a grate beneath the heat source. Broiling is a favorite way of preparing steaks, chops, chicken and many other items. Some broilers are said to go as high as 2000<sup>0</sup> F (1100<sup>0</sup>C) at the burner.

### Light Equipments (Fig- 2B)

1. **Toasters-** These are small electrical equipments with slots and electrical elements on the side inside. It is used for making bread toasts.
2. **Sandwich griller-** is equipments with two flaps which get heated by electricity. The inner surface is made of grooved/channeled cast iron plate. Sandwiches are placed in between the plates and then pressed tightly to roast the outer layer and have channeled carving on it.
3. **Blow torch -** it is an equipment used for browning the outer surface of food like in au-grating dishes. It has a long mouth from which liquid fuel like petrol or diesel or propane bursts out with flames.

4. **Sizzler plate** – These are a cast iron plate which is heated on gas ranges and then cooked food is placed on it. Sizzler plates are placed on the guest's table with the food on it so that it remains hot.
5. **Induction cook tops** - A fairly new type of range top, the induction cook top is slowly making its way into commercial kitchens. This equipment does not become itself. Rather, it works by magnetically agitating the molecules in steel or iron cookware so that the cookware becomes hot. There are no hot surfaces or open flames. Also, no warm-up is required. The top can be turned instantly on or off. The disadvantage of this cook top is that only iron or steel pots can be used. Traditional aluminum or copper cookware will not work. Some manufacturers of cookware have responded to the new demand by producing pots and pans made of aluminum sandwiched between layers of stainless steel. In this ways, the good heat-conducting qualities of aluminum are preserved as well as adapted to this new technology.

### 2.3.2 COLD GENERATING EQUIPMENTS

1. **Refrigerators** –also called “fridge”, may be vertical type or Horizontal type with 2-5 or more doors. In vertical ones the upper party is the coldest, while the lower part is cool, but in horizontal ones it is just the opposite. Comprises a thermally insulated compartment and a heat pump—chemical or mechanical means—to transfer heat from it to the external environment (i.e., the room in which it is located), cooling the contents to a temperature below ambient.
2. **Freezer** - are used to hold foods for longer times, or to store foods purchased in frozen form.  
There are so many sizes, models, and designs of refrigeration equipment that it would be futile to try to describe them all here. The temperature ranges from 0<sup>0</sup>C to – 20<sup>0</sup>C.
3. **Walk-in** – These are refrigerated rooms in which one can walk inside. The inside temperature ranges from 2<sup>0</sup>C to 12<sup>0</sup>C. The walls are insulated with a big door. It is used to keep large pots and pans full of food. It also has racks on the sides to keep pre-prepared or prepared food items.
4. **Reach-in** – are electrically operated cool cabinets with temperature ranging from 4<sup>0</sup>C to 24<sup>0</sup>C. It has transparent glass mirror on one side so that one can view the items placed in it. It is generally placed in confectionary, sweet shops, salad bars etc..

#### Light Equipments (Fig- 2B)

1. **Bottle chillers** – are small cabinet with bottle racks, kept in pantry, where juice bottles are kept for cooling.
2. **Mini room fridge** – are small refrigerators to keep small items of food. Generally these are found in efficiency room kitchens.

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### 2.3.3 OTHER EQUIPMENTS

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#### Heavy equipments: (Fig- 2C)

1. **Potato peeler** – is an upright electrically operated machine with round drum with rough inner lining made of rock. The potatoes are dropped from the upper opening and the peeled potatoes are thrown out by the latched door at the side. The friction of the potatoes with the rough surface peels off the skin.

2. **Wet grinder** – It is an electrical modern version of pestle and mortar. It is used to grind wet masalas. The mortar is rotated with the pestle at the center caused the masalas to grind to paste.
3. **Dish washing machines** – is an electrically operated machine with slots to hold soiled cutlery and crockery/ hot water along with detergent sprays on the utensils to make it clean. The racks in the machine have slots for plates, bowls, glasses etc.
4. **Ice making machines** – is a machine which produces ice. It is attached with the tap. The water from the tap enters the machine in individual moulds. It is then immediately frozen and collected in drum.
5. **Working tables** – comes in various shapes and sizes according to the need. Some has garbage disposal attachments in it, while some has vertical racks on it, All working tables should be at least 2 ½ feet tall, made of thick stainless steel.
6. **Dough mixture** – is a machine which is used to prepare dough, also acts as whipper and creamer. This is basically used in bakery and large quantity dough preparation for chapattis and other Indian breads.
7. **Sinks** – are used for cleaning pots and pans. These are stainless steel 3- compartment tables. For cleaning, washing and rinsing purpose. This is used in manual dish washing method.

#### Light Equipments (Fig- 2E)

- 1) **Mixer and grinder** – are available in variety of brands with multiple attachments for grinding and mixing.
- 2) **Juicer** – used to extract juice from vegetables and fruits. They also come in multiple sizes.
- 3) **Slicer** - this machine has a number of attachments with different sized blades. Used for slicing vegetables, fruits, sausages etc.
- 4) **Chopper** – This machine chops all the vegetables and fruits according to the sizes required.
- 5) **Blender** – this equipment has jars with whippers and cutters. Used for blending ingredients, both solids and liquids.
- 6) **Whisker** – This equipment has wire whisk attachment. Used to whisk cream, butter and other bakery ingredients.
- 7) **Juicer Mixer Grinder** – is a combination of all the three and can perform functions like shredding, chopping, whipping, dough making, grinding, blending, mixing and extracting juice. In short it is called JMG.

**Hand tools:** Hand tools are designed to aid in cutting, shaping, moving or combining foods. They have few, if any, moving parts. Knives, discussed separately later, are the most important hand tools. Others are metal or rubber spatulas, spoons, whisks, tongs and specialized cutters. In addition to the items shown here, many hand tools designed for specific tasks, such as pressing tortillas or pitting cherries, are available. Sturdiness, durability and safety are the watchwords when selecting Hand Tools. Choose tools that can withstand the heavy use of a professional Kitchen and those that are easily cleaned.

**Knives:** Knives are the most important items in your tool kit. With a sharp knife, the skilled chef can accomplish a number of tasks more quickly and efficiently than any machine. Good quality knives are expensive but will last for many years with proper care.

Select easily sharpened, well constructed knives that are comfortable and balanced in your hand. A good knife begins with a single piece of metal, stamped, cut or best of all forged and tempered into a blade of the desired shape.

The metals generally used for knife blades are;


1. **Carbon steel**—An alloy of carbon and iron, carbon steel is traditionally used for blades because it is soft enough to be sharpened easily. It corrodes and discolours easily, however, especially when used with acidic foods.
2. **Stainless steel**—Stainless steel will not rust, corrode or discolour and is extremely durable. A stainless steel blade is much more difficult to sharpen than a carbon steel one, although once an edge is established; it lasts longer than the edge on a carbon steel blade.
3. **High-carbon stainless steel**—an alloy combining the best features of carbon steel and stainless steel, high—carbon stainless steel neither corrodes nor discolours and can be sharpened almost as easily as carbon steel. It is now the most frequently used metal for blades.
4. **Ceramic**—A ceramic called zirconium oxide is now used to make knife blades that are extremely sharp, very easy to clean, rustproof and nonreactive. With proper care, ceramic blades will remain sharp for years, but when sharpening is needed, it must be done professionally on special diamond wheels. Material costs and tariffs make ceramic-bladed knives very expensive. Although this ceramic is highly durable, it does not have the flexibility of metal, so never use a ceramic knife to pry anything, to strike a hard surface (for example, when crushing garlic or chopping through bones) or to cut against a china or ceramic surface. A portion of the blade, known as the tang, fits inside the handle. The best knives are constructed with a full tang running the length of the handle; they also have a bolster where the blade meets the handle (the bolster is part of the blade, not a separate collar). Less expensive knives may have a 3/4th—length tang or a thin “rattail” tang. Neither provides as much support, durability or balance as a full tang.

Knife handles are often made of hard woods infused with plastic and riveted to the tang. Moulded poly- propylene handles are permanently bonded to a tang without seams or rivets. Stainless steel handles welded directly to the blade are durable but very lightweight. Any handle should be shaped for comfort and ground smooth to eliminate crevices where bacteria can grow.

Knife shapes and sharpening Equipment you will collect many knives during your career, many with specialized functions not described here. This list includes only the most basic knives and sharpening equipment. (Fig- 2F)

- 1) **French knife-** used for general purpose chopping, slicing, dicing etc. Blade length is 10 inches which is wider at the heel and tapers to the point
- 2) **Utility knife-** narrow, pointed knife 6-8 inches long. Used mostly for pantry work, cutting and preparing vegetable leaves, fruits etc.
- 3) **Paring knife-** these are small pointed blade 2-4 inches long. Used for trimming, and paring vegetables and fruits. They may be straight edged or curved edge.
- 4) **Boning knife-** Thin, pointed blade about 6 inches long. Used for boning raw meat and poultry. Stiff blades are used for heavier work.
- 5) **Filleting knife-** These knives have 6-10 inches long thin flexible blades. Thin Flexible blades are used for lighter work and for filleting of meat and fish.

- 6) **Slicer or Pallet-** long, slender, flexible blade up to 14 inches long. Used for carving and slicing cooked meats. This is also known pallet knife.
- 7) **Serrated Slicer-** similar to slicer, but has serrated blade. Used for carving, slicing meat and cutting breads manually.
- 8) **Butcher knife-** Heavy, broad, slightly curved blade. Used for cutting, sectioning and trimming raw meats in the butchers shop.
- 9) **Scimitar or steak knife-** Curved, pointed blade. Used for accurate cutting of steaks.
- 10) **Cleaver or chopper-** has a flat, wide blade, heavy with thick handle. Used for cutting through bones.
- 11) **Clam knife-** Short, rigid, broad –bladed knife with a slight edge. Used for opening clams.



### Handling Knives Safely

- . Use proper knife for each kind of work. |
- . Knives should always be clean and sharp and should have sturdy and manageable handle.
- . Hold the knives properly while cutting and apply pressure equally on both ends. Cut away from your body.
- . Never try to catch falling knives.
- . Never leave your knife unattended on the table or elsewhere. Keep them properly and safely in cupboard or drawer in its own cover or on designated rack. Never keep them immersed in water.
- . Always keep your cutting board, table or block neat and clean
- . Always keep a distance between yourself and others while working with knife otherwise you may cause accident.
- . Always walk with knife with its blade and point facing downwards.

Fig.2 B

#### Small tools (Fig- 2G)

- 1) **Vegetable peeler-** short tool with a slotted, swiveling blade. Used to peel vegetables and fruits

- 2) **Steel-** It is though not a knife, but is used to sharpen knives. It has parallel ridges upon which knives are chafe upon.
- 3) **Cutting board-** are usually made of wooden blocks upon which cutting is done. Nowadays fibrous blocks of different colors are available.
- 4) **Melon ball scooper-**It has small scoop on both or either side. It is used to scoop out ball shaped vegetable.
- 5) **Cooks fork-** Heavy two pronged fork with long handle used for lifting and turning meat and other items.
- 6) **Pallet -** A flat, long flexible blunt knife basically used in bakery of spreading icings.
- 7) **Rubber spatula-** has a flat rubber end, used for wiping off gravies and liquids from bowls and other utensils.
- 8) **Offset spatula-** Has broad blade, bent to keep hands off hot surfaces. Used for turning and lifting food items.
- 9) **Skimmer-** Perforated spoons with long handles, used in deep and shallow frying.
- 10) **Tongs-** spring or scissor type tool used to lift or handle foods.
- 11) **Wire whip-** Loops of stainless steel wire fastened to a handle. Used for mixing, whipping, creaming, beating food.
- 12) **China cap-** It is a cone shaped strainer used to strain soups, stocks, sauces etc.
- 13) **Strainer-** round bottomed, cup shaped strainer made of screen type mesh. Used to strain pasta, vegetables, soups, tea etc.
- 14) **Sieve-** screen type mesh supported in a round metallic frame. Used for shifting flour and other powdery items.
- 15) **Colander-** large perforated bowl made up of stainless steel or aluminum. Used to strain cooked rice, pasta etc.
- 16) **Grater-** a four sided metal box with different types of perforation on each side. Used for shredding, and grating vegetables and food.
- 17) **Channel knife-** it has a very short blade with groves, so that it can produce channel shaped groves on vegetables while carving.
- 18) **Can opener-** used to open tins and cans

#### Measuring devices (Fig- 2H)

- 1) **Scales-** most recipe ingredients are measured by weight, so accurate scales are required. Scales may be electronic or manual type, small sized to larger ones depending upon the requirement.
- 2) **Measuring cups-** are available in 1-2,  $\frac{1}{2}$  -  $\frac{1}{3}$  – and  $\frac{1}{4}$  - cup sizes. They can be used for both dry and liquid measures.
- 3) **Measuring spoons-** are used for measuring very small volumes: 1 table spoon, 1 tea spoon.  $\frac{1}{2}$  tea spoon and  $\frac{1}{4}$  teaspoon. They are used most often for spices and seasonings.
- 4) **Ladles-** are used for measuring and portioning liquids. The size, in ounces, is stamped on the handle.
- 5) **Scoops-** come in standard sizes and have lever for mechanical release. They are used for portioning soft solid foods (ice creams).
- 6) **Thermometer-** measures the temperature of the food items. These can measure temperature from  $-30^{\circ}\text{C}$  to  $400^{\circ}\text{C}$

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### 2.3.4 METALS AND CONDUCTIVITY

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A good cooking utensil distributes heat evenly and uniformly. If it does not, it will develop hot spots that are likely to burn or scorch the food being cooked. Two factors affect a pan's ability to cook evenly:

1. **Thickness of the metal.** A heavy-gauge pot cooks more evenly than one made of thin metal. Thickness is most important on the bottom.
2. **Kind of metal.** Different metals have different conductivity, which means the speed at which they transfer heat. The following materials are used for cooking equipment.
  - **Aluminum** is used for most cooking utensils in food service kitchens. It is a very good conductor, and its light weight makes pots and pans easy to handle. Because it is a relatively soft metal, it should not be banged around or abused. Do not use aluminum for storage or for long cooking of strong acids because it reacts chemically with many foods. Also it tends to discolor light-colored foods such as sauces, especially if they are stirred or beaten with a metal spoon or whip.
  - Pans made of anodized aluminum, have surfaces that are harder and more corrosion-resistant than regular aluminum pans do. Although this is not, strictly speaking, a nonstick finish, it is less porous than untreated aluminum, so foods are less likely to stick. Also, it is more resistant to acids than regular aluminum, and it will not discolor light-colored foods. Its disadvantages are that it is more expensive than and not quite as durable as standard aluminum.
  - **Copper** is the best heat conductor of heat and was once widely used for cooking utensils. However, it is extremely expensive and requires a great deal of care. Also it is very heavy. Today it is used mostly for show. Copper react chemically with many foods to create poisonous compounds, so copper pans must be lined with another metal, such as tin or stainless steel.
  - **Stainless-steel** is a poor heat conductor. Cooking pots and pans made of it tend to scorch foods easily. Stainless-steel is ideal for storage containers because it will not react with foods as aluminum does. It is also used for low-temperature cooking or holding equipment, such as steamer pans and counter pans, where scorching or hot spots are not a problem. Stainless-steel pots and pans are also available with a heavy layer of copper or aluminum bonded to the bottom. Heavy aluminum pans may also be lined with stainless steel on the inside, or on both the inside and outside. This feature gives the advantages of stainless steel (its hardness, durability, non-reactivity with acid foods, and non-discoloration of light sources) with the heat-conducting qualities of copper or aluminum. These pans are usually expensive.
  - **Cast iron** is a favorite material with many chefs because of its ability to distribute heat evenly and to maintain high temperatures for long periods. It is used in griddles and heavy skillets. Cast-iron cracks easily if dropped. It rusts quickly unless kept properly conditioned and dry.
  - **Porcelain enamel**-lined pans should not be used. In fact, they are forbidden by some health departments. They scratch and chip easily, providing good hiding places for bacteria. Also, certain kinds of gray enamel can cause food poisoning if chipped.
  - **Non-stick plastic**-type coatings, known by brand names including Teflon and Silverstone, provide a slippery finish, but one that requires a lot of care because it is easily scratched. Do not use metal spoons or spatulas with this equipment. Many chefs keep a set of non-stick egg pans and use them for no other purpose.



- **Glass and earthenware** have limited use in commercial kitchens because they are very breakable. They are poor conductors of heat but are resistant to corrosion and food acids.

### **Pots and pans and their uses (Fig- 2H)**

#### **1. Stockpot**

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

#### **2. Saucepot**

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

#### **3. Brazier**

It is a round, broad, shallow, heavy-duty pot with straight sides. Used for browning, braising, and stewing meats. Sizes: 11 to 30 quarts (or liters).

#### **4. Saucepan**

It is similar to a small, shallow, light saucepot, but with one long handle instead of two loop handles. It may have straight or slanted sides. Used for general range-top cooking. Sizes: 1 1/2 to 15 quarts (or liters).

#### **5. Sauté pan**

It is similar to a shallow, straight sided saucepan, but heavier. Used for browning, sautéing and frying. Due to its broad surface area, the sauté pan is used for cooking sauces and other liquids when rapid reduction is required. Sizes: 2 1/2 to 5 inches (65 to 130 mm) deep; 6 to 16 inches (160 to 400 mm) in diameter. This is also called frying pan but the edges are much shorter.

#### **6. Double boiler**

Lower section, similar to a stockpot, holds boiling water. Upper section holds foods that must be cooked at low temperature and cannot be cooked over direct heat.

#### **7. Roasting pan**

Larger rectangular pan, deeper and heavier than bake pan. Used for roasting meats and poultry.

#### **8. Chaffing pan**

Also called counter pan may be rectangular, square or round shape which is used to hold food in service counters for buffet. The upper pan is fitted on a lower one filled with water. The water is heated from beneath, thus heating the food in the upper pan; it comes in various sizes according to the requirement.

#### **9. Stainless steel bowls**

It is round flat bottomed bowl of various sizes, ranging to much shallower version (shallow bowls) to straight side ones. These are used to store mis-en-place, preparation and storage of sauces, mixtures, condiments etc.

#### **10. Pot wash**

Pot washing is the process of cleaning low to heavily baked-on items off of restaurant kitchen food equipment, including pots, pans, trays, tubs and more. Pot washing is often a heavy sector in restaurants and kitchens, ergonomically a burden and a bottleneck in the process. It is often difficult to keep the pot-washing area clean and overall can be quite labor-intensive.

**a) Manual hand washing**

The classic and “old” process for cleaning pots and pans is the manual hand-washing method. Washing pots and pans by hand is still the ideal way to do the job. Cleaning by hand involves a pot-washing sink, which almost always is divided into 3 different sections. The first section, or "sink", is where the pots are washed and scrubbed. The middle section is for rinsing and the third for sanitizing.

**b) Power scrubber**

In simple terms, the power scrubber is a pot brush with an electric motor. Recognizing the effort it takes to scrub pots with baked-on food or grease, these brushes rotate on flexible power shafts and scour pots, pans and utensils with minimal effort. The power unit for the scrubber typically mounts on the wall at the pot sink and is connected to a six-foot flexible shaft used to scrub the soiled dishware. A variety of brushes and scrubbers can be fitted so that it can be easily changed on the shaft. In addition there are wire brushes for scouring tougher soil and even an impregnated plastic composite head for scrubbing baked-on carbon deposits from pots and baking pans.

**c) Recirculating soaker**

The recirculating soaker does most of the work itself with little manual scrubbing required. These units basically consist of a big water pump built into a pot sink. The cleaning formula behind the recirculator is simply water agitation or water moving around soiled pots and pans to loosen and wash away food particles and dirt. While this motion will quickly wash away light to medium soil, heavy soil and baked-on carbon deposits could require some scrubbing. Some units also have built-in heaters that work in conjunction with the circulating jets. By keeping the water warm, these heaters act as an aid in loosening soil.

**d) Heated soak tanks**

Another recent innovation is that of heated soak tanks. These tanks come in various sizes, but all act off the same principles. The tanks are heated to a temperature of approximately 185 °F (85 °C) which acts as a catalyst for the chemical reactions whereby the carbon and fats from the heavily soiled pots and pans break down. The chemicals used in these cleaning tanks are non caustic and often biodegradable, with a PH of 10-11. Lightly soiled items can be soaked for a couple of hours, whilst badly burnt pots should be soaked overnight. The tanks are known to be used in no less than 20 000 restaurants worldwide.

## HEAT GENERATING HEAVY EQUIPMENTS



Fig. 2C

**HEAT GENERATING  
LIGHT EQUIPMENTS**



**Toaster**



**Blow torch**



**Induction Cooker**



**Sandwich Griller**



**Sizzler plate**

**COLD GENERATING  
HEAVY EQUIPMENTS**



**Refrigerator**



**Freezer**



**Reach-in**

**COLD GENERATING  
LIGHT EQUIPMENT**



**Bottle chiller**



**Mini-room Fridge**

**Fig. 2D**

OTHER HEAVY EQUIPMENTS



Dish washing machine



Sink



Dough Mixture



Potato Peeler



Working table



Juicer

OTHER LIGHT EQUIPMENTS



Mixer Grinder



Juicer mixer grinder



Slicer and chopper

Fig. 2E

# KNIVES



**Fig.2F**

SMALL TOOLS



Fig.2G

SMALL TOOLS



Fig.2G

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CHECK YOUR PROGRESS EXERCISE-I

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Q.1 Classify equipments.



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**Q.2 Food equipments can be dangerous. Elucidate.**

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**Q.3 Give 5 examples of heat generating light equipments**

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## **2.4 MAINTENCE OF KITCHEN EQUIPMENTS**

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### **Care and Maintenance of Equipments**

1. Keep all kitchen equipment clean.
2. Wash all removable parts of kitchen equipment with suitable detergent and hot water after each use. In tropical summers this is not necessary, as the water in the taps is usually warm to hot, depending on the environmental temperature. After washing wipe kitchen equipment completely dry before replacing.
3. All small kitchen equipment like cutlery, ladles, chopping boards, kitchen tools, etc. should be washed after use in (2) and replaced in drawers and racks built for the purpose and covered to prevent them from dust or dirt during storage.
4. Check that all pieces are in working order. Close supervision at work is necessary to ensure a careful handling and to detect any deviations from effective operation, like an unusual sound, or fusing of warning lights, or ineffective thermostatic controls.
5. Repairs must be attended to without delay to prevent the kitchen equipment from giving way and disrupting work for any period of time.
6. A weekly, fortnightly or monthly programme for oiling or servicing the kitchen equipment to maintain movable parts or machinery in order is important. The service instructions provided by the manufacturer along with the kitchen equipment are a good guide to the service procedure that should be followed. It is useful to prepare an instruction card for each and every kitchen equipment carrying the manufacturer's instruction in as simple a form as will be understood by the operators of the kitchen equipment. This card could be kept near each major piece of kitchen equipment.

7. All electrical inputs to the kitchen equipment should be checked periodically to ensure that proper electrical load is available for efficient functioning.
8. Insulations, plumbing, and other connections need periodic checks to keep kitchen equipment at optimum efficiency.
9. Make full use of warranty periods to help train organization staff to learn regular maintenance procedures from the manufacture's engineers.
10. Assign the care of each machine to one responsible person.

### 1) Light equipments:

Clean and wash all the light equipment thoroughly, wipe them and then use.

**Care:** All light equipments should be cleaned and washed with hot soapy solution immediately after use. All small utensils should be wiped dry.

### 2) Pressure Cooker

Fill the cooker only  $\frac{3}{4}$ , cover it with lid, and check rubber and safety valve. Keep weight (whistle) on and keep it on slow flame. Do not keep cooker on high pressure burner.

**Care:** Wash pressure cooker with soapy water, wipe dry. Check safety valve, rubber ring regularly.

### 3) Meat Mincer

- a. Fix attachments i.e., rotating rod, blade, sieve, and rings, tightly with the machine.
- b. Keep tray on, put vegetable dices / boiled potatoes / meat without fat in the tray.
- c. Put on main switch, and then turn mincer's switch.
- d. Slide vegetable or meat little at a time, press with wooden rod.

**Care:** Remove all the attachments of mincer. Soak in warm water for 10 minutes. Remove and wash with soap solution. Rinse and wipe dry. Keep in clean cupboard. Grease when necessary.

### 4) Masala Grinder

- a. Wash grinder and stone.
- b. Keep stone in grinder, attach belt to it put the masala ingredients in grinder with enough of moisture.
- c. Put on main switch of grinder.

**Care:** Detach belt from grinding stone, remove all the masala from stone. Wash thoroughly and wipe dry. Grinder wash with warm water, wipe with dry duster. Do over-hauling once in a month. Do not run the stone in grinder and start without putting masala or idli mixture etc. in it.

### 5) Dough Mixer

- a. Wash bowl and dough kneading rod, or creamer or whisk.
- b. Fix bowl on mixer, then attach rod or creamer as per requirement.
- c. Put ingredients in the bowl, lift up the bowl by turning the handle anti-clock wise.
- d. Press green switch, increase speed by turning gear-handle clock-wise. After use reduce speed, press red switch lift-down the bowl by turning handle clockwise remove mixing rod and then remove the finished product.

**Care:** Put off main switch of the dough mixer. Wash all the attachments. Check belt of the motor occasionally.

**6) Potato Peeler**

- a. Wash Peeler from inside tightly close the door. Put potatoes from top.
- b. Start main switch as well as water supply. After peeling open door of the peeler, let all the peeled potatoes come out of the peeler. Switch off the main.

**Care:** Detach upper deck of the peeler, wash it thoroughly with scrubber, rinse and wipe it dry. Remove all the potato peels from it, scrub thoroughly with scrubber wash and dry completely. Fix upper deck and check for its function.

**7) Griller – Hot Plate**

- a. Wipe griller - hot plate with damp duster.
- b. Put on the switch, once it becomes hot, put pre-prepared item on it and cook.

**Care:** Cast iron grill plates may occasionally need scraping. After every season, it is the best to wash the plates with a mild detergent solution, rinse and dry.

**8) Tandoor**

- a. Put charcoal in tandoor separately light some coal on gas burner.
- b. Pour live coal in tandoor. Keep the ash-pit half open.

**Care:** Allow the tandoor to cool. Once in week coat the tandoor with mixture of ash, earth and water. Season inside of the tandoor with mustard and oil.

**9) Deep Fat Fryer**

- a. Clean and wipe deep fat fryer.
- b. Put oil/fat in containers, put on main switch turn temp, control knob, press operating switch.
- c. Once oil reaches desire temp, add frying food to the fryer. When breaded foods are prepared, strain fat frequently.
- d. Load fry basket to one-half and never more than 2/3 of capacity.
- e. Never salt foods directly over the fat. Salt in the fat reduced its life.
- f. Discard fat as soon as it tends to bubble excessively before food is added gummy film collects on the frying basket or heating element.
- g. Raw, wet foods such as potatoes and oysters, should be drained or wiped dry before frying to extend the life of the fat.

**Care:** Switch off the fryer and allow it to cool. Drain all the oil in normal way. Remove all debris and particle matter from the fryer. Fill the fryer compartment with soap solution. Brush inside using a bristle brush (never use steel wool). Flush with clean water to which vinegar has been added. Dry with cloth.

**10) Tilting Pan**

- a. Ensure that pan is tightly fitted by moving handle of the pan.
- b. Switch on the main, and then switch on operating switch, turn temp. control on high.
- c. Start gas connection. Press ignition switch for 20 secs. Put fat or oil and then use according to preparation.

**Care:** The equipment should be cleaned thoroughly after use. Normally washing with hot soapy water and rinsing with clean water will be sufficient. Wire scourers or scouring powders are not recommended for models with an all stainless steel finish. If the pan has been used for frying, care should be taken to remove all oil film build up. The tilting mechanism may require occasional greasing with a light non-toxic oil. This will ensure easy and trouble free operation.

**11) High Pressure Burners Range**

- a. Start main connection of gas. Slightly turn the operating knob towards left and light the gas with help of match-stick or gas lighter.
- b. Do not increase gas pressure before lighting the burners.

**Care:** - Immediately wipe up all the spillings and boilers. If during cooking periods, spillings are left to bake and harden on hot surfaces the cleaning becomes much more difficult.

**12) Convection Oven**

- a. Switch on oven, set the temperature, once it reaches desire temp.
- b. Always load the lower compartment first. Always load each shelf evenly, spacing pan, trays away from each other and the side of the oven.
- c. Never add material to a section after food has already have started to bake. Open doors as seldom as possible

**Care:** The oven should be switched off. The oven should be allowed to cool until only warm. Remove all removable shelves or rack for separate clearing. Using a clean cloth soaked in hot soap solution, wipe the oven. Rinse the cloth as necessary. The shelves and racks should be cleaned in the same way.

**13) Refrigerator / Deep Freezer / Walk-in Coolers**

- a. Once installed, temperature is to be set as required and store food items at proper temperature.
- b. Do not store items that tend to absorb smell from other food items such as eggs near a strongly aromatic food item.

**Care:** Refrigerating equipments need to be kept clean at all times. Remove spoiled food items regularly and defrost if necessary.

**14) Rotary mixers and pulverizer**

Rotary mixers-This is an important labour saving, electrically operated machine used for many purposes; e.g. mixing doughs, batters, mashing potatoes, beating egg whites, making mayonnaise etc.

Pulverizer-They are labour saving devices used for mincing and cutting various vegetables.

- a. No material likely to damage the blade is to be sliced.
- b. Each section in contact with food should be cleaned and carefully dried after use.
- c. The blades should be sharpened regularly
- d. Moving parts should be lubricated, but oil must not come in contact with the food
- e. Extra care must be taken when the blades are exposed.

**Care:** These equipments are electrically operated, so cleaning is to be done after removing the main power socket. Care to be taken while cleaning the blades. Washed thoroughly and clean dry.

**15) Hot cupboards (hot plate) and Bain marie**

- a. Hot plates are used for heating plates and keeping food hot. Care should be taken to see that the heat is regulated or controlled to a reasonable temperature.
- b. A bain marie is an open well of water used for keeping food hot, and is available in many designs. Care should be taken to see that the bain marie is never allowed to burn dry and that there is always water in the well.

**Care:** Power plugs of both equipments are to be removed before cleaning. Hot plates are to be cooled before cleaning. They are scrubbed with detergent and washed dry. Hot water from the bain marie to be removed, scales to be removed, bottom pan to be cleaned dry.

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## 2.5 SELECTION OF KITCHEN EQUIPMENTS

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In general, only commercial food service tools and equipment should be used in a professional kitchen. Household tools and appliances that are not NSF- certified may not withstand the rigors of a professional kitchen. Look for tools that are well constructed. For example, joints should be welded, not bonded with solder, handles should be comfortable, with rounded borders; plastic and rubber parts should be seamless.

Before purchasing or leasing any equipment, you should evaluate several Factors:

1. Is this equipment necessary for producing menu items?
2. Will this equipment perform the job required in the space available?
3. Is this equipment the most economical for the operations specific needs?
4. Is this equipment easy to clean, maintain and repair?

**Selecting and Purchasing the Right Equipments:** The type, amount and the size of the equipments will depend on the type of menu provided. Their placement, suitability, quality and quantity, all determine how simple any work can be made without excess fatigue. When a kitchen is planned, standard symbols are used which can be produced on square paper to provide a scale design. Wash hands facilities and storage of cleaning equipments must not be omitted.

Well-designed catering equipments need to confirm certain standards, which in some countries are statutory, while in others are left to the moral and ethical standards of the caterer who is expected to safeguard the health of the staff and the customers. The following features built into design would help to ensure not only safety and health of the operators, but the customers as well.

- The design should be easy to clean either wholly or in parts.
- The design should not provide loopholes for entry of insects, dust or dirt.
- Overall dimension (in relation to the space available).
- Weight-can the floor supports the weight?
- Simple design as it will be easy to clean.
- Should not have sharp corners, holes or cracks and all parts made easily accessible for clearing.
- Fuel supply – is the existing fuel supply sufficient to take the increases?
- Drainage where necessary, is there adequate facility?
- Use – does the equipment justifies good use?
- Capacity – can it cook the quantity of food required?
- Time- is it time effective?
- Noise – does it have acceptable noise?
- Appearance –is it eye appealing to the customers?
- Spare parts- are they ready available in the local market?

**Purchasing equipments:** Purchasing equipments involve tapping the proper sources of supply, as the expenditure forms the Capital Investments of the organization. The selecting the right supplier the following sources can be compiled:

1. Budget available
2. Past experience
3. Interviewing salesman
4. Equipment catalogue
5. Trade directories and journals
6. Competitors experience
7. Trade, fairs, seminars, conferences, etc.
8. Request for quotations

**Schedule for care of equipments:**

1. Keep all equipments clean.
2. Wash all the removable parts with suitable detergents and hot water and wipe completely dry before replacing
3. All small equipments washed would be kept in cupboards or covered to prevent from dust and dirt's.
4. Check all pieces are in working order
5. Repairs should be attended immediately
6. A weekly, fortnightly or monthly programme for oiling or servicing of equipment should be scheduled. For this a card (service card) should be tagged on the equipment.
7. All electrical equipments should be checked periodically.
8. Make full use of warranty periods.
9. Assign the care of each machine to one responsible person.
10. Always refer to the manufacturer's instructions before using any equipment.

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## 2.6 PERSONAL HYGIENE

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“Delivering safe food to the dinner table is the culmination of the work of many people. Producers, shippers, processors, distributors, handlers, and numerous others perform actions every day that may affect the safety of our food. Everyone's challenge is to perform these individual actions as well as possible, so that the food Indians eat is free from physical hazards and dangerous levels of pathogenic microorganisms and hazardous chemicals.” While every player in the flow of food from farm to table has some degree of responsibility for food safety, you are usually the last line of defense before food reaches the consumer. Because of this, you have a significant share of the responsibility for ensuring safe food. By voluntarily developing a food safety management system, you can better ensure that the foods served or sold in your establishment are safe.

Although employees have a legal obligation to ensure health, safety and security within the workplace, employees, colleagues and other persons are also responsible for taking these issues in hand.

Any health safety, hygiene and security issue such as burnt hand or a case of food poisoning must be reported immediately to the seniors in a recorded manner with the following columns

- i. Date and time of accident
- ii. Name of the person

- iii. Nature and cause of accident
- iv. Who were present nearby?
- v. Reason of cause (if possible)
- vi. Any remedial action if required

Food hygiene involves the following:

### 1. Personal hygiene

- a. It is required that good hygiene systems are followed by all food handlers.
- b. Have a shower at least once a day.
- c. Always change the clothes you wear every day.
- d. Never wear jewelry or timepieces on you during the working hours.
- e. Have short trimmed hair. Women chefs are to cover their hair with nets
- f. Shave even if there is a slight growth of facial hair
- g. Keep your fingernails short and clean
- h. Wear shoes that cover the whole foot not thongs or sandals to prevent accidents in the kitchen.
- i. Wear clean, neat clothing that is not damaged or exposed to the skin and covers arms and legs to help prevent injury if there is an accident.
- j. Always use clean utensils and never use utensils that have been used for raw food with cooked food.
- k. Do not smoke near or around food preparation area.
- l. Smoking is strictly prohibited at working area.
- m. Always wear clean and sanitized protective clothing like chef coat, hat, apron trousers etc. while working in kitchen.
- n. Wash your hands in between jobs with luke warm water and detergent. Pat it dry
- o. See a doctor at least once a month to ensure you are disease free.

### 2. Tasting food whilst cooking

- a. Use disposable spoons for tasting food.
- b. Food should never be tasted using fingers, as it just like spitting into the food
- c. Food handlers should never chew gums, eat sweets, or touch their mouth and nose while cooking.

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

- a. **Floors** - Should be durable, non-slip and non-permeable.
- b. **Walls** - Ceramic wall tiles were considered the best surface for areas where liquids splash a wall surface, potentially overcoming a damp or hygienic problem.
- c. **Ventilation**- The requirement of a higher performance kitchen ventilation system for modern kitchen with hoods and canopy system is essential.
- d. **Lightening**- Good lighting is essential to avoid eye strain. Natural lights are best but where artificial lightening is used some thought should be given to the type used.

- e. **Ceiling-** White coloured to reflect light, smooth textured, without cracks is recommended.
- f. **Equipments-** should be easy to handle, without any sharp edges, noiseless, can be cleaned and maintained easily.

**Washing and Keeping Clean:** Germs can be found everywhere, in our environment, on our hands, cleaning cloths, utensils and food. Consuming food contaminated with these germs can cause food poisoning.

We can prevent food from becoming contaminated simply by washing and keeping our hands, food and environment clean.

Good kitchen and personal hygiene practices are crucial in protecting your family's health and well-being. Together, we can keep food safe!

- Keep Your Food Clean
- Keep Your Kitchen Clean
- Keep Your Hands Clean

### 1. Keep your food clean

- Wash and soak fruits and vegetables before eating or cooking.
- Remove the soiled portions of vegetables
- Cut off the base and wash away any residual soil in a basin of tap water.
- Soak the vegetables in fresh tap water for 15 minutes.
- Before cutting and cooking, rinse the vegetables again in a basin of fresh tap water. Special detergent and washes are not needed.
- For harder items like potatoes, scrub the skin gently with a brush.
- Avoid cutting and shredding fruits and vegetables too early to preserve the nutritional value as some nutrients may be lost when exposed to air.
- Do not put raw vegetables on a plate that has previously held raw meat, poultry or seafood until it has been thoroughly washed. The juices from the raw food can contaminate the raw vegetables that you are going to eat. This is known as cross-contamination.
- Clean raw meat and seafood before storing or cooking to remove dirt and other contaminants.
- Place raw food in tightly-wrapped plastic bags or covered containers in the refrigerator to prevent raw food juices from dripping onto other food.
- Wash and dry utensils – including chopping boards and knives – and surfaces thoroughly before and after preparing raw meat, poultry and seafood. It is best to use separate cutting boards and utensils for raw and cooked food. If you only have one cutting board, always wash it thoroughly with soap and hot water between uses.

### 2. Keep your kitchen clean

- Keep cutting boards, utensils, cleaning cloths, sinks and countertops clean and dry to prevent accumulation of dirt and harbouring of bacteria.
- Place kitchen waste in bags or covered bins and dispose them frequently. Kitchen waste attracts insects and rodents which can carry germs.
- Clean all kitchen surfaces and countertops with detergent and hot water.
- Cutting boards in particular are prone to harbouring bacteria. Use a brush to scrub off the stubborn food and dirt particles. Sanitize plastic cutting boards with chlorine or bleach solution.



- A smelly dishcloth, towel or kitchen sponge is a sure sign of unsafe bacterial growth. Kitchen sponges in particular, can harbour millions of bacteria. Disinfect these in chlorine solution or heat for 2 minutes in the microwave oven.
- Frequently change tea towels or dishcloths that come into contact with plates and utensils. After using them, dry them quickly to prevent germs from breeding.
- Clean up as soon as possible. Do not let food residue dry on kitchen surfaces and utensils. It becomes more difficult to remove.

### 3. Keep your hands clean

- Wash your hands thoroughly with soap and water before handling any food items or utensils.
- Wash your hands before and after preparing food, especially raw meat, poultry and seafood and before handling cooked or ready-to-eat food.
- Wash your hands after:
  - Using the toilet.
  - Touching rubbish/bins.
  - Coughing or sneezing or caring for the sick.
  - Handling pets

### 4. Keep food in the pantry

- Keep foodstuffs such as coffee, tea, powdered milk and biscuits in clean, air-tight containers, away from heat and moisture.
- Check food storage cupboards regularly to ensure that it is free from insect infestation or contamination.
- Discard foodstuff that has been left open, or if there are signs of insect infestation or if it is beyond its expiry date. Where there has been insect infestation, clean up the storage area and food scraps and look for signs of the insects in the next 2 weeks.
- Do not store food in the same cupboard with the photocopying chemicals, cleaning agents or insecticide to avoid chemical contamination of food.

### 5. Keep the pantry clean and tidy

- Keep cupboards meant for food storage uncluttered and clean. Clean countertops and tables daily with soap and water and disinfect regularly.
- Change hand and dish towels daily. Damp towels promote bacteria growth.
- Clean up quickly after spilling food or drink before the residue become hard to remove.
- Dry kitchen utensils and containers thoroughly before putting them away.

### Food safety when preparing food

#### Handling frozen food

- Do not thaw food at room temperature. It is safer to thaw food by defrosting overnight in the refrigerator, or by using the microwave oven.
- Do not hold marinated food at room temperature. Keep marinated food in a covered bowl in the refrigerator.

### Handling dairy products

- Do not leave dairy products sitting at room temperature. Take only what you need to consume and return the unused portion to the refrigerator.

### Handling vegetables

- Rinse all fruits and vegetables thoroughly in a basin of tap water to remove any dirt, bacteria or chemical residues.
- Soak the vegetables in a basin of fresh tap water for 15 minutes.
- Before cutting and cooking, rinse the vegetables once more in a basin of fresh tap water. Special detergents or washes for fruits and vegetables are not needed.
- Do not store ripe fruit with vegetables as ripe fruits produce ethylene gas that can cause green leafy vegetables to turn yellow.

### After shopping

- Return home directly after your shopping. You may want to bring insulated containers/cooler bags complete with ice or ice packs for the storage of chilled, frozen and other perishable food when you go shopping.
- Do not store chilled and frozen food directly in the boot of the car as the heat may cause the food to go bad.

### How to develop a daily hygiene routine

Cooked food is that commodity which deteriorates fast due to contamination and cross-contamination as a result they become a serious health problem for the workers and the customers. This results in bad name of the institution and has a negative impact on the business. Hence every establishment should pay extreme attention on the hygiene and sanitation of their workers and their work place and also on the purchase of ingredients, usage, and storage and service.

Every hotel worker should pay full attention on his/her personal hygiene and for which he/she should:

1. Bath every day with soap.
2. Should have trimmed nails in hand and feet.
3. Males should have nicely cut small hair and female with hair net properly tucked.
4. Beard properly shaved or trimmed or covered with net.
5. Wearing any kind of jewellery (except wedding ring) is prohibited.
6. Prohibit applying strong perfumes.
7. Wear neat, clean and spotless and odourless clothing.
8. Wash hand before entering the kitchen and moving out of the kitchen.
9. Do not spit or smoke in any part of the kitchen.
10. Wash hand after handling garbage or other soiled items.
11. It is strictly prohibited to sneeze, cough or itch in the kitchen.
12. Wear proper fitted uniforms.
13. Apply bandage or band-aid on any cut, bruise or burn part of the body.
14. Workers with contagious disease should restrict themselves entering the food place or in the hotel.



Fig.21 cross contaminations

**Don't cross-contaminate**

Cross-contamination occurs in food when raw food comes into contact with cooked food, for example when the juices of raw meat, poultry or seafood come into contact with ready-to-eat food. Cross-contamination is the most common cause of food poisoning. (Fig. 2I) To prevent this:

- Do not mix raw food with food that has already been cooked.
- Store raw meat, poultry and seafood at the bottom shelf of the refrigerator so that their juices do not drip onto other food. Ensure that they are tightly wrapped in plastic or are placed individually on separate plates.
- Use different cutting boards and utensils for raw and cooked food. If you only have one cutting board, always wash thoroughly with soap and hot water between uses.
- After cutting raw meat, seafood and poultry, wash the knives thoroughly before cutting other food.

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## 2.7 FOOD HANDLING AND STORAGE

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Cook your food well-The meal should not only be enjoyable but also safe to eat. Cooking at high temperatures (above 75°C) will destroy most bacteria.

- Cook meat and poultry thoroughly. There should be no pink meat and the juices should run clear when the meat is pricked or sliced.
- Do not cook food partially as this increases the risk of bacterial growth.
- Cook seafood (like fish and cockles) thoroughly, especially when cooking for young children, people with illnesses, pregnant women and older folks.
- Keep hot food hot. Serve food immediately after cooking. Food to be served hot should be held at 60°C or above to prevent bacterial growth.
- Reheat stored cooked food at temperatures of 75°C and above to kill bacteria.

**Using the microwave**

If you use a microwave oven to cook, ensure that the food is evenly cooked. Otherwise bacteria may survive and cause food poisoning:

- Watch out for 'cold spots' in the food. Stir the food midway while cooking to ensure that the whole dish is evenly cooked.
- Use a covered dish. Arrange the food uniformly and add a little water. Under a cover, the steam formed will help kill bacteria and ensure even cooking.
- Always follow the food manufacturer's instructions on the waiting period after food is cooked in the microwave oven, to ensure that the temperature is sufficient to kill all bacteria. When reheating cooked food, cover the food to hold in the moisture and promote safe, even heating.
- Reheat food till it is steaming hot before removing.
- Use only microwave-safe containers. Never use recycled butter or cheese containers as these may melt and cause chemical contamination to your food.

**Thawing-** a process of bringing frozen food to normal temperature

- As far as possible, thaw meat without opening the package to prevent contamination, dehydration and absorption of foreign flavours.
- Thaw only the amount required.

- Place the frozen meat in the refrigerator or use the microwave oven to thaw meat safely.
- In general, the time required for thawing 500g of frozen meat is as follows:
  - Refrigerator: overnight
  - Microwave oven: 3 - 5 minutes

(Note: thawing times vary with size, thickness and shape of meat.)

Do not refreeze meat that has been completely thawed as it may cause deterioration in quality. Improper handling and refreezing of meat may lead to growth of bacteria to levels that can cause food poisoning.

Instead of freezing unused portions, keep them chilled in the refrigerator for up to two days. Alternatively, extra portions can be cooked first and then stored chilled or frozen until the next meal. Remember to separate raw meat from cooked or ready-to-eat food to prevent cross-contamination.

### Food safety when storing food:

- Keep cold food cold.
- Keep food outside of the temperature danger zone (between 5°C to 60°C), where bacteria multiply quickly.
- Keep cold food cold in the refrigerator, or on a bed of ice until it is time to serve.
- Store dried food in a cool, dry place

Dried and preserved food should be stored in a cool and dry place, or kept in the refrigerator to prolong the shelf life. Warm and humid conditions can cause dried food to turn moldy and rancid at a faster rate.

- Nuts can keep better and longer in airtight containers when stored in a cool, dry place away from light. It is best to keep them in an enclosed cupboard or in the fridge.
- Mouldy food should be discarded as it may contain harmful mycotoxins.
- Transfer dried foods that are bought loose or unused contents of opened packages of dried and preserved foods to airtight containers.
- Dried and preserved foods that will be kept for extended periods should be stored in packaging that does not allow entry of air or water vapor into the package to prevent rancidity or moldy growth of food.

### Storing

- Store frozen meat in the freezer at -18°C.
- For storage of frozen meat in larger packaging, thaw the meat just enough (to about -10°C) to separate into smaller portions, then deep freeze in individual packs.
- Ensure there are sufficient space in-between items placed in the freezer or refrigerator so that cold air can circulate freely around them.
- Do not open refrigerator or freezer doors more often than necessary to minimize temperature fluctuation.
- Do not overstock your meat supply. Follow the rule of first in–first out, i.e. use older stock first.

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## 2.8 PEST CONTROL AND FUMIGATION

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A pest is simply an animal whose interest is some way to conflict with the interest of man.

The aim and objective of pest control is:-

- a) To minimize the number of pests.
- b) To minimize the images, inconvenience and distress they cause.
- c) Eliminate the human diseases they may transmit.
- d) We can design constant and maintain building in such a way that pest are denying and harbourage.
- e) We can store food stuff and disposed of waste in such a way as to deny food supply to paste.
- f) We can apply various chemicals to kill the pest.
- g) We can and must educate people in or in other activities.

**Dealing with rodent infestation:** Rats and mice are more like to be found in kitchens and dining room than in bed rooms, scraps of food, candles, soap, etc.

There are three main ways of destroying them:-

- a) Trapping
  - b) Fumigation
  - c) Poisoning
- 
- a) **Trapping-** Generally wire cages traps are used for this purpose, traps should be placed in those areas where rodents are seen, but this effective only when the number of rodents present in small number. Rats are very coming creatures and will ignore the route. Where they will see their male caught in traps.
  - b) **Fumigation-** is a method of pest control that completely fills an area with gaseous pesticides—or fumigants—to suffocate or poison the pests within. It is used to control pests in buildings (structural fumigation), soil, grain, and produce, and is also used during processing of goods to be imported or exported to prevent transfer of exotic organisms. This method also affects the structure itself, affecting pests that inhabit the physical structure, such as woodborers and drywood termites. This is very effective method of eradication of pests and should be carried with trained squad. This process involves releasing of certain gaseous in air in closed areas like CO<sub>2</sub>, Carbon monoxide, sulphur dioxide, etc.
  - c) **Poisoning-** Bats consist of an inner base to which some poison is added. The common bases are flour, bread & sugar, and the most common poison used is Barium Carbonate white arsenic, phosphorous.

**Insect infestation:** Insects are responsible for an enormous amount of food spoilage because of their breeding and feeding habits. It is always better to prevent insect's infestation to have control over it. Prevention is assisted by correct building design, efficient maintenance, and speedy removal of kitchen waste and rubbish & definitely with adequate ventilation.

**Insect control:** The main and most effective method of controlling the growth of insects is by the application of insecticides. These insect spray effect an organism in three ways which are as follows:-

- a) Contract insecticides: They are absorbed via external surface of skin of insect.

- b) Systemic insecticides: Here the organism will effect via alimentary canal.
- c) Respiratory insecticides: Organism is affected via respiratory tract by inhaling toxic gaseous.

**Fleas:** These are common nuisance. They are usually transferred from animals to humans and then to the hotel kitchens. These cause disease called plague and typhoid. They can be controlled by effective periodical fumigation and vacuuming

**Cockroaches:** There are several species of nocturnal insect that spend most of the day hiding in cracks, around drains, or in other dark, secluded services. Two common species of cockroach are the German & the oriental. These are both large insects, though the oriental is the larger of the two by some margin. Adult oriental cockroach grows 20-40mm in length while German grows only 10-15mm in length. The oriental cockroach is more frequently found in cooler, less humid areas such as basement and drains. Cockroach carries food poisoning bacteria in their bodies and is responsible for spreading of dysentery and gastroenteritis. Contamination occurs when the insect comes into contact with food for human consumption. The female cockroach produces up to 8 purses like eggs cases at monthly intervals.

**Silverfish:** These are silvery gray insects that look like minute fish without fins. They are about 1cm or smaller in length. They are nocturnal insects, preliminary found in most areas, and feed on cellulose material such as paper and cellulosic fabric such as cotton, and keeping moist areas cleaned and treating with them insecticides will help rid of these pests. Pyrethrum and sodium fluoride Cristal are effective against silver fish.

**Lice:** These insects pest are attracted to human hair, they are gray and measure about 3mm each. The adult lice cling to hair with their hooks and their eggs called nits. Stick to hair and clothing, linen and upholstery. In hotel they may be left on pillows and upholstery and be easily passed from one guest to other. Lice causes irritating bites on the scalp and the scratching due to it may lead to infection. To prevent head lice pillow cases and head rest covers on chair should be changed and cleaned frequently. Head beards should be wiped daily. In case of any infestation the person should specially medicated shampoo for lice and other should not use the infected personal belongings such as combs and brushes, towel and cloths.

**Ants:** These insects generally invade in large number when they come in search of food, especially sweet substances. They enter through crevices and travel along a definite tract in a procession so that when runs are found, the ants can be systematically trapped at the point where they enter an establishment. If the runs cannot be found, the vulnerable areas must be implied of food, thoroughly cleaned, and borax which repeals them spread over the shelves until the ants cease to come and eventually go to find food elsewhere. If the nest is located, it can be destroyed by placing 2 tabs spoon full of carbon disulphide at the entrance.

**Termites:** These are social insects, like ants. They are also called white ants because of their appearance. They have caste system that consist of worker termites, soldier and winged reproductive termites, including one or more queen and king termite. The queen termites create the colony by laying eggs of tending to the colony until enough insects are produced to take care of the colony. The two most common type of termite are dry wood and ground termites.

To prevent termites infestation, the soil should be treated before the construction of building with an appropriate termite killer fluid during construction, should not be allowed to come within 6 inch of ground. Wood impregnated with sodium arsenate should be used and surrounding areas of the ground be kept in contact with this chemical. Seal all cracks and crevices. In case of an infestation highly puncture kick out holes and inject appropriate insecticides into the holes. Saturates infested furniture with Ortho-die- chloro benzene. Finally wax and varnish all wood and coat with linseed oil to cover the pores old furniture may be drenched in kerosene before refinishing.

**Mosquitoes:** This transmits diseases such as malaria, filarial and yellow fever. As the life cycle of mosquitoes begin in male denote allow water to stagnate in and around the property repair and fill all pills and puddles. Cover drain and pour kerosene oil into this to prevent larvae from thriving these and growing into adult mosquitoes. Fine gauze on windows prevents the entry of mosquitoes.

An effective, eco-friendly method for the controlled of mosquitoes is the place pots of water around the property for a week or two during this time .the mosquitoes lay their eggs in the water before the egg can develop, however this water is discarded, killing the larvae.

**Fumigation Process:** Fumigation generally involves the following phases: First the area intended to be fumigated is usually covered to create a sealed environment; next the fumigant is released into the space to be fumigated; then, the space is held for a set period while the fumigant gas percolates through the space and acts on and kills any infestation in the product, next the space is ventilated so that the poisonous gases are allowed to escape from the space, and render it safe for humans to enter. If successful, the fumigated area is now safe and pest free. Fumigation is a hazardous operation. Generally it is a legal requirement that the operator who carries out the fumigation operation holds official certification to perform the fumigation as the chemicals used are toxic to most forms of life, including humans. Post operation ventilation of the area is a critical safety aspect of fumigation. It is important to distinguish between the pack or source of the fumigant gas and the environment which has been fumigated. While the fumigant pack may be safe and spent, the space will still hold the fumigant gas until it has been ventilated.

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## 2.9 HACCP

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**What is HACCP?** HACCP, as you may already know, is an acronym that stands for Hazard Analysis Critical Control Point, a systematic, science based approach used in production as a means to assure food safety. The concept for HACCP was developed in the 1960's by the Pillsbury Company in consultation with the US National Aeronautics and Space Administration (NASA) and the U.S Army laboratories at Natick which developed microbial safety of food stuffs including physical and chemical hazards in foods. HACCP is therefore the most cost effective approach devised for ensuring the safety of food.

**Definition:** Management system which food safety is addressed through the analysis and control of biological, chemical and physical hazards from raw material production, procurement and handling to manufacturing, distribution and consumption of finished product.

From the above definition, HACCP is a food-related operation which considers the following points

1. Identify and assess hazards at every stage of operations, right from start to finish.
2. Determine the critical control points.
3. Establish the critical limit and procedure to monitor each critical control points, and
4. Establish corrective procedures.

It is a preventive and a continuous approach to food safety identifying examining, analyzing/evaluating and establishing corrective measures and controlling hazards at every stage of a food related operation.

Unlike traditional safety assurance programmes focused on identifying problems in the finished product, HACCP, a recent proactive, preventive technique, focused on identifying potential problems and controlling them during the design and production process itself.

### **Advantages of HACCP**

- It is a proactive system for assuring safe production of food by emphasizing prevention rather than inspection;
- Addresses all types of hazards – microbiological, physical and chemical and reduces the risk of contamination;
- Focuses on identifying and preventing hazards from contaminating food
- Is based on sound science
- Permits more efficient and effective government oversight, primarily, because the record keeping allows investigation to see how well it is doing on any given day
- Places responsibility for ensuring food safety appropriately on the food manufacture or distributor.
- Helps food companies compete more effectively in the world market, and
- Reduces barriers to International trade by demonstrating conformance to international standards and regulations and requirements of overseas markets.

### **The other benefits of HACCP are:**

#### **A) Benefit to consumers**

- Reduces risk of food borne diseases
- Increased confidence in food supply
- Increased awareness in basic hygiene
- Increase quality of life ( health and socioeconomic)

#### **B) Benefits to Industry**

- Increased market access
- Reduction in production costs through reduced wastage and recall of food
- Increased consumer and government confidence
- Mitigating the business risk

#### **C) Benefit to Government**

- Improved public health
- Reduced public health cost
- Enhanced facilitation of International trade
- Increased confidence of the community in the food supply



Safe Quality Food (SQF) 2000 is a HACCP quality code designed specifically for business in the food industry.

**THE PRINCIPLES OF HACCP:** The 1997 National Advisory Committee for the Microbiological Criteria for Foods (NACMCF) recommendations updated the seven HACCP principles to include the following: (Fig. 2J)

1. ***Perform a Hazard Analysis.*** The first principle is about understanding the operation and determining what food safety hazards are likely to occur. The manager needs to understand how the people, equipment, methods, and foods all affect each other. The processes and procedures used to prepare the food are also considered. This usually involves defining the operational steps (receiving, storage, preparation, cooking, etc.) that occur as food enters and moves through the operation. Additionally, this step involves determining the control measures that can be used to eliminate, prevent, or reduce food safety hazards. Control measures include such activities as implementation of employee health policies to restrict or exclude ill employees and proper hand washing.

2. ***Decide on the Critical Control Points (CCPs).*** Once the control measures in principle no. 1 are determined, it is necessary to identify which of the control measures are absolutely essential to ensuring safe food. An operational step where control can be applied and is essential for ensuring that a food safety hazard is eliminated, prevented or reduced to an acceptable level is a critical control point (CCP). When determining whether a certain step is a CCP, if there is a later step that will prevent, reduce, or eliminate a hazard to an acceptable level, then the former step is not a CCP. It is important to know that not all steps are CCPs. Generally, there are only a few CCPs in each food preparation process because CCPs involve only those steps that are absolutely essential to food safety.

3. ***Determine or establish the Critical Points.*** Each CCP's must have boundaries that define safety. Critical limits are the parameters that must be achieved to control a food safety hazard. For example, when cooking pork chops, the Food Code sets the critical limit at 145 °F for 15 seconds. When critical limits are not met, the food may not be safe. Critical limits are measurable and observable.

4. ***Establish Procedures to Monitor CCPs.*** Once CCPs and critical limits have been determined, someone needs to keep track of the CCPs as the food flows through the operation. Monitoring involves making direct observations or measurements to see that the CCPs are kept under control by adhering to the established critical limits.

5. ***Establish Corrective Actions.*** While monitoring CCPs, occasionally the process or procedure will fail to meet the established critical limits. This step establishes a plan for what happens when a critical limit has not been met at a CCP. The operator decides what the actions will be, communicates those actions to the employees, and trains them in making the right decisions. This preventive approach is the heart of HACCP. Problems will arise, but you need to find them and correct them before they cause illness or injury.

6. ***Establish Verification Procedures.*** This principle is about making sure that the system is scientifically-sound to effectively control the hazards. In addition, this step ensures that the system is operating according to what is specified in the plan.

Designated individuals like the manager periodically make observations of employees' monitoring activities, calibrate equipment and temperature measuring devices, review records/actions, and discuss procedures with the employees. All of these activities are for the purpose of ensuring that the HACCP plan is addressing the food safety concerns and, if not, checking to see if it needs to be modified or improved.

**7. Establish a Documentation and Record Keeping System.** There are certain written records or kinds of documentation that are needed in order to verify that the system is working. These records will normally involve the HACCP plan itself and any monitoring, corrective action, or calibration records produced in the operation of the HACCP system. Verification records may also be included. Records maintained in a HACCP system serve to document that an ongoing, effective system is in place. Record keeping should be as simple as possible in order to make it more likely that employees will have the time to keep the records.



Fig.2J

**The Use of HACCP as A Food Safety Management System:** Since the 1960's, food safety professionals have recognized the importance of HACCP principles for controlling risk factors that directly contribute to food borne illness. The principles of HACCP embody the concept of active managerial control by encouraging participation in a system that ensures food borne illness risk factors are controlled. The success of a HACCP program (or plan) is dependent upon both facilities and people. The facilities and equipment should be designed to facilitate safe food preparation and handling practices by employees.

Properly implemented, a food safety management system based on HACCP principles may offer you the following other advantages:

- Reduction in product loss

- Increase in product quality
- Better control of product inventory
- Consistency in product preparation
- Increase in profit
- Increase in employee awareness and participation in food safety

### **Implementation of HACCP**

HACCP is a system that assists organizations to identify potential food safety hazards in the entire food supply chain and to take preventive measures for their control. HACCP focuses on the prevention of hazards rather than relying on end product testing. The following sequence of 12 steps, included in the guidelines developed by the Codex Committee on Food Hygiene, is the recommended approach to develop a HACCP programme.

#### **Step 1: Assemble HACCP team**

Set up a multi-disciplinary team that includes representatives from production, sanitation, quality control, food microbiology, etc. This team should be assigned specific segments of the food chain to be covered in the HACCP system, and be entrusted with developing a HACCP system as described from Step 2 onwards. Top management must give its full support to the team. If the required expertise is not available within the company, bring in help from a consultant.

#### **Step 2: Describe product**

Draw up a full description of the product for which the HACCP plan is to be prepared, including product composition, structure, processing conditions, packaging, storage and distribution conditions, required shelf life, instructions for use, etc.

#### **Step 3: Identify intended use**

Identify the intended use of the product by the end-user or consumer. You need to determine where the product will be sold as well as the target group (e.g. institutional catering, homes for senior citizens, hospitals, etc.).

#### **Step 4: Construct flow diagram**

You need to carefully examine the product/process and produce a flow diagram around which to base the HACCP study. Whatever the format you choose, study all the steps involved in the process – including delays during or between the steps from receiving the raw material to placing the end-product on the market – in sequence, and present them in a detailed flow diagram with sufficient technical data. In the diagram, you might also want to include the movements of raw materials, products, wastes, a plan of working premises, equipment layout, product storage and distribution, and of employee moves or changes.

#### **Step 5: On-site confirmation of flow diagram**

The HACCP team should confirm the processing operation against the flow diagram during all stages and hours of operation and amend the flow diagram if necessary.

#### **Step 6: List all potential hazards associated with each step, conduct a hazard analysis, and consider any measures to control hazards**

Using the flow diagram, the team should list all the hazards – biological, chemical or physical– that may reasonably be expected to occur at each process step, and describe the preventive measures that can be used to control such hazards (for example, the use of air curtains, hand and feet washing at entrance to processing areas, wearing of head

gear, use of good manufacturing practices [GMP]/standard operating procedures [SOP]/ sanitation standard operating procedures [SSOP], etc.).

**Step 7: Determine Critical Control Points (CCPs)**

You may wish to use a decision tree with “yes” or “no” answers to facilitate the determination of CCPs (See Annex A). When applying the decision tree, you need to remain flexible and use common sense to avoid, wherever possible, unnecessary control points throughout the whole manufacturing process. If you identify hazards at a step where control is necessary for safety and no preventive measures exist at that step, you need to modify the process at that step, or at an earlier or a later stage, to include a preventive measure. For example, in a slaughterhouse, covering carcasses with a sanitized cloth to prevent infection by flies is a preventive measure at the carcass stage, which substitutes for a preventive measure such as washing the prepared meat at the next stage, as it will not be possible to disinfect the meat at this stage, i.e., during cutting or mincing operations.

**Step 8: Establish critical limits for each CCP**

You need to establish critical limits for each CCP. They are normally derived from specifications included in the food legislation of a country or in national or international standards (e.g. moisture levels in milk powder, or pH level and chlorine limit in potable water, etc.). When limits are not taken from regulatory standards (e.g. frozen storage temperature) or from existing and validated guides of good manufacturing practices, the HACCP team should ascertain the validity of such limits relative to the control of identified hazards and critical points.

**Step 9: Establish a system of monitoring each CCP**

Monitoring is the scheduled measurement or observation of a CCP to determine conformance to its critical limits. The monitoring procedures must be able to determine loss of control, if any, at the CCP (e.g. improper control of the temperature that may lead to faults in the functioning of a pasteurization unit in a dairy plant). Monitoring for CCPs needs to be done rapidly, as they later relate to on-line processes, and there is usually no time for lengthy analytical testing. Physical and chemical measurements are often preferred as these can be done rapidly and can frequently indicate microbiological control of the product. The programme of observations or measurements should properly identify for each critical point:

- Who is to perform monitoring and checking;
- When monitoring and checking are performed; and
- How monitoring and checking are performed.

All records and documents associated with monitoring CCPs must be signed by the person(s) doing the monitoring.

**Step 10: Establish corrective actions**

The HACCP team should develop specific corrective actions and document them in the HACCP plan for each CCP in the HACCP system so that they can deal with deviations when they occur. Such corrective action should include:

- Proper identification of the person(s) responsible for implementation of a corrective action;
- Actions required to correct the observed deviation;

- Action to be taken with regard to products manufactured during the period when the process was out of control; and
- Written records of measures taken.

The actions must ensure, for example, that the CCP has been brought under control, that procedures or conditions that created the out-of-control situation have been corrected, and the food affected, disposed off safely, etc.

### **Step 11: Establish verification procedure**

Develop a verification procedure to ensure that the HACCP system is working correctly. The procedure should include the frequency of verification, which should be conducted by a responsible and independent person. Examples of verification include auditing methods, random sampling and analysis, etc.

### **Step 12: Establish documentation and record keeping**

The HACCP system requires efficient documentation and accurate record keeping. For example, hazard analysis, identified CCPs and their limits (including revisions, if any) should be documented. Examples of records are CCP monitoring records, records of deviation found and corrective action taken on them, etc.

## **FOOD PRE-PREPARATION HAZARD AND CONTROL RULES**

**Food Thawing-** Thaw in the refrigerator. Thawing can also be done in the microwave followed by immediate cooking or in cold, flowing water. Alternatively, food / meat can be cooked directly from the frozen. If thawing, make sure the center gets thawed by testing with your thermometer for a temperature of above 32°F before beginning the cooking process.

**Food washing.** All raw fruits and vegetables must be double washed before preparation. Take off the wrapper leaves and put the vegetables in the first wash sink with a lot of cold water. Agitate for 1 minute to loosen dirt. Remove from the first sink and put in the second sink with clean water and scrub / agitate again. Drain dry.

**Serving raw foods.** All raw food has some degree of pathogenic microorganism and chemical contamination. There is always a question as to the safety of raw food. The best prevention strategy is to buy from a safe source. A safe source can best be defined as one where personnel are knowledgeable about the hazards of the product and know the process used to assure the safety of the food they sell. They can tell you what they have done to assist you in removing dirt and bacteria from the raw food.

**Hard foreign objects.** Be very careful to keep hard and foreign objects out of food. Keep can openers closed. Wrap spice and herb seeds in cheesecloth bags so they can be removed. Watch for bones. Remove all packaging material. Do not use staples or twist-ties. Always sort through dry beans, lentils, etc. to remove grits and stones.

**Ingredient control.** Observe all ingredients as they are used in food preparation and reject any that are off-color, have strange odors, appear to have bubbles when they should not, show evidence of insects or rodents, or in any other manner appear to be below standard.

If you have any doubt, throw it out.

Before disposing of the food, record it on the waste control sheet and show it to your supervisor. Never use taste or smell to judge safety. Very hazardous food can smell and taste fine. Do not add fresh food to cold food.

Before disposing of the food, record it on the waste control sheet and show it to your supervisor. Never use taste or smell to judge safety. Very hazardous food can smell and taste fine. Do not add fresh food to old food.

Example of decision Tree to identify CCPs

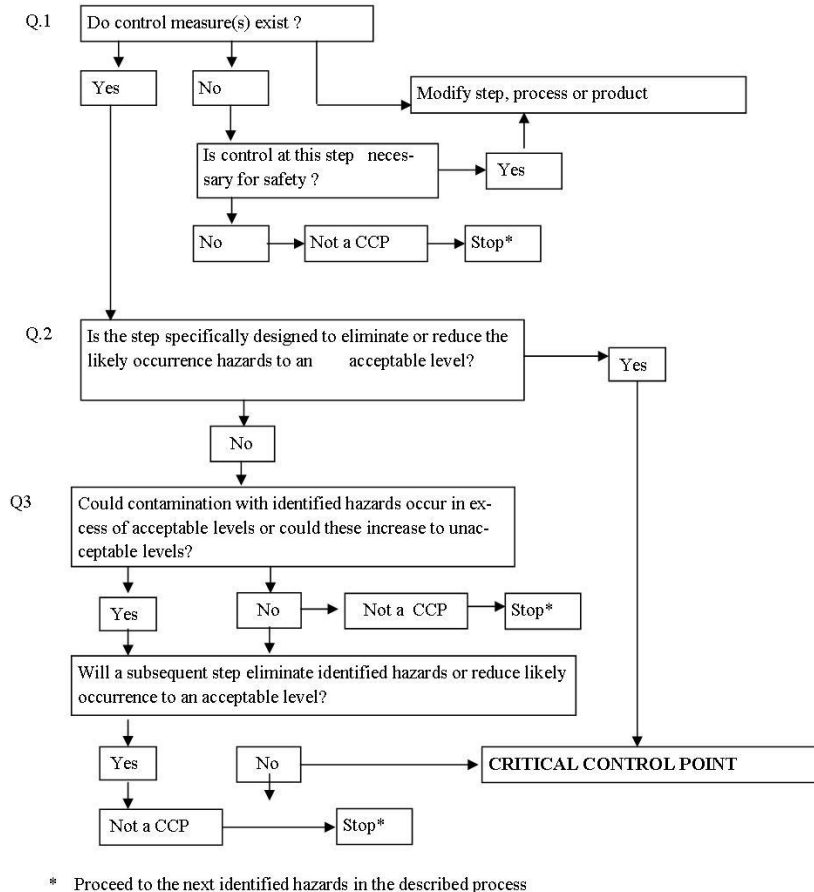


Fig.2K

**Allergenic ingredient control.** The final step before any product is produced is to verify that the ingredients being used are exactly the ingredients that are specified; that the equipment food contact surfaces are clean; and there will be no ingredient cross-contamination from the last item produced. Separate raw and cooked food preparation equipment. keep raw and cooked food separate. Use separate cutting boards and knives for working with raw and cooked foods. Equipment with raw food contamination must not contact cooked food without first being cleaned and sanitized. Never store a raw product above a cooked product.

**FOOD PREPARATION HAZARD AND CONTROL RULES**

**Cooking temperatures**

Food items	Cook to this temperature or hotter
Poultry	165 °F
Ground/punctured meat, fish, eggs	155 °F
Solid cuts of meat, fish, eggs	145 °F
Roast beef	130 °F

Use a thermometer to check internal cooking temperatures.

**Microwave cooking.** Cover and cook food to  $\geq 165^{\circ}\text{F}$  (stir or rotate the food during the cooking process), then let the food stand with cover on for 2 minutes.

**Food tasting.** Use a fresh, sanitized utensil each time food is tasted so that contaminants from the mouth will not get into the food. Roasts and thick foods. Once cooked, these food items will be kept at  $>130^{\circ}\text{F}$ .

**Sauté and thin foods.** A thin-stem, tip-sensitive, calibrated, digital thermometer will be used to assure that center temperatures meet pasteurization standards.

**Sauces, soups, and beverages.** Hollandaise and other egg and heavy cream sauces do not tolerate continuous  $150^{\circ}\text{F}$  holding. Make hollandaise, béarnaise, and mayonnaise sauces with 1 tablespoon of vinegar or lemon juice per egg yolk, and they will have a pH of less than 4.1 and be safe.

**Fruits, vegetables, legumes, and cereals.** Many fruits are high- acid foods ( $\text{pH} < 4.6$ ) and are not a food safety problem unless mixed with meat, fish, or poultry items. Cereals and raw vegetables (carrots, potatoes, onions, cabbage, mushrooms, etc.) are contaminated with spores and before cooking and must be kept cold (less than  $41^{\circ}\text{F}$ ) or packaged to allow air exchange. After cooking, all vegetables, such as green beans, baked or boiled potatoes, and cereals, such as rice, will have activated spores and must be maintained above  $135^{\circ}\text{F}$  or cooled to below  $41^{\circ}\text{F}$  within 6 hours.

**Bread, batters, and pastry.** Bread and pastry dough are not as hazardous as other foods, because normally they are moderately dry. Care must be taken if a very moist product is produced. Icing and protein (milk and egg) fillings can be hazardous. These fillings must be cooled to  $41^{\circ}\text{F}$  in 6 hours before using in items such as éclairs or custard pies. When a hazardous topping, such as an egg white meringue, is baked or browned, the center temperature of the meringue and temperature at the interface of the pie and meringue must reach  $165^{\circ}\text{F}$  to kill *Salmonella*. The pie and meringue must be safely cooled to  $41^{\circ}\text{F}$ . Cooked mixtures should be placed in cakes, shells, crusts, or other baked goods while still hot, above  $165^{\circ}\text{F}$ , then the topping added, and the item baked or cooked. This controls contamination on the surface of the product.

**Batters** (such as pancake batter) held at room temperature shall be discarded after 4 hours of use.

**Hot combination dishes.** When cooked or precooked ingredients are combined and reheated, they must reach a center temperature of  $165^{\circ}\text{F}$  in less than 2 hours.

**Cold combination dishes.** These foods are always a potential hazard. Wash, cook, cool, and prepare all ingredients separately and start with them at a temperature such as  $41^{\circ}\text{F}$ , so that, when combined, the temperature is less than  $50^{\circ}\text{F}$ . Adding the flavoring and spices in the sauce or dressing before mixing ingredients will help provide uniform flavor distribution. You can prepare large batches if the temperature is always below  $50^{\circ}\text{F}$ , which controls the toxin production by *Staphylococcus aureus*. When preparing these items, always wash hands before starting and use sanitized utensils and containers.

**Food Transport, Holding, and Serving Hazard and Control Rules**

**Hot holding.** To keep food at 135°F or hotter, preheat equipment to 135°F or hotter before adding food.

**Food serving temperatures.** All foods served to customers shall be above 135°F (57.2°C) [150°F (65.6°C) for quality] or below 41°F (5°C) when they leave the service area. Improperly cooked, warmed, or held food, or food that shows signs of deterioration, is rejected.

**Serving, packaging, transporting.** Keep hot food covered as much as possible to maintain surface temperatures and prevent surface dehydration. Hot food must be above 135°F or, if between 135 and 41°F, served within 4 hours. If food is open on a steam table, buffet, or service line, the surface temperatures will be below 130°F unless the pan is covered. Check on individual portions every 20 minutes, and casseroles at least every hour. Open, hot food should be discarded if not used within 4 hours.

**Reheating for hot holding**

- Heat food to 165°F or hotter in 2 hours or less.
- Use a thermometer to check the temperature.

**Beverage dispensing equipment.** Make sure all beverages dispensing equipment is cleaned regularly, according to manufacturer's instructions.

**Milk product dispensers.** Thoroughly clean milk and milk product dispensers, such as soft-serve machines (especially the gaskets and O-rings.) Always sanitize them before they are put into use each day, and replace gaskets when damaged.

**Salad bar.** Ice in non-refrigerated salad bars shall be filled to the level of food in the containers. Ice is not needed in mechanically refrigerated salad bars. Cold food items must be cold (41°F or less) before being placed in the salad bar, because salad bar units are not designed to cool food. Cold food items will slowly warm to about 55°F in the top layers in most salad bars. Therefore, leftover salad bar product shall never be added to fresh product beyond the safe time-temperature allowed. Some leftover salad bar items (e.g., carrot sticks, chopped onions, celery sticks) may be used in a recipe (stews or soups) in the kitchen.

**Dispensing tableware and flatware.** Tableware and flatware (both multiple use and single service) shall be dispensed in a sanitary manner so that surfaces that comes into contact with food or the mouth is protected from contamination. Handles of flatware shall be presented to the user. No unnecessary tableware is left on the table with the customer. All tableware left with the customer is washed before it is reused.

**Self-service food, dishes, and utensils.** The customer must not be allowed to return to a salad bar or buffet line for refill with used dishes. Take the dirty dishes and utensils, and give the customer fresh tableware and a clean plate for additional food. They can return with a used cup or glass for more of a beverage.



**Food exposed to the customer.** Serve customers only the amount of jelly, butter, bread, cream, etc. that they are likely to consume. All unpackaged food left with the customer must be thrown out. Packaged food such as crackers and jelly can be reserved. No unnecessary open food is left on the table with the customer.

**Table condiments.** Condiment containers shall be clean and uncontaminated, not open or abused, and shall be discarded replaced if they appear to be below standard. Individually portioned condiments may be provided for table service or counter service. Condiment bins shall be kept clean. Commercially packed condiment containers shall not be refilled. Ingredients in partially filled condiment containers may be sent to the kitchen for use in cooking.

**Ice.** Use tongs or a plastic or metal scoop to fill glasses with ice so that there is never a chance of a chip of glass getting mixed in the ice. Keep all glass (such as coffee pots) and other breakable ceramic tableware away from the ice bins or machine. Never reuse ice that has been in contact with food packages or used for displays. If you think that any glass or other contaminating material has gotten into the ice, throw it out.

### **Cooling food**

#### **Cooling hot foods**

Cooked / prepared food shall be cooled from 135°F to less than 41°F in 6 hours or less (from 135°F to 70°F within 2 hours followed by cooling to 41°F or below within a total cooling time of 6 hours). . Use a thermometer to check this.

#### **Quick cooling methods**

1. Use shallow pans (for soups, sauces, gravies, etc.): This method can also be used for small-to-medium-sized pieces of meat.
  - a. Put a 2-inch layer of food in a shallow, metal pan.
  - b. Do not cover.
  - c. Put the pan in the cooler where cold air can blow across it.
  - d. Cover, label and date the food after it has cooled.
2. Ice bath
  - a. Put the food container into an ice bath.
  - b. Stir the food every 30 minutes—more often if possible.
3. Add ice instead of water (to soups, stews, etc.)
  - a. Add only half the water before cooking.
  - b. After cooking, add the other half as ice.
4. Use chilling wands or paddles (for large containers)
  - a. Place the clean, frozen wand in the food and stir.
  - b. Use another rapid-cooling method to finish, such as the shallow pan method described above.

**Storage time.** Food spoilage microorganisms can grow and continue to reduce the quality of cooked, cooled, ready-to-eat food while it is refrigerated. All stored food must be dated and rotated. The longer it is held, the lower the quality and customer satisfaction.

**Storage containers.** Single-use items such as plastic bread bags, seamed metal cans, ketchup bottles, crimped aluminum pie tins, and glass jars shall not be reused after original contents have been removed. Food (particularly high-acid food) shall never be stored, prepared, and cooked or processed in containers that contain toxic materials such as galvanized metal, chipped enamelware, lead and lead glazes, or copper.

### **Cold holding**

Temperature- Keep food at 41°F or cooler at all times.

### **Time**

Foods prepared in the establishment: These foods can be served for up to 7 days after preparation if they are date labeled (see below) and stored below 41°F.

1. Foods purchased in ready-to-eat form (e.g., sliced sandwich meat and hot dogs): These foods can be served for up to 7 days after opening if they are date labeled (see below) and stored below 41°F.

**Date labeling.** Label a food with its preparation date if it is going to be held longer than 24 hours.

### **Freezing**

1. This stops the 7-day clock, but does not set it back to zero.
2. Before freezing a food, label it with the number of days it was held after cooking or opening.
3. After thawing, the food can be served for the rest of the original 7 days.
4. If the food was not date labeled before it was frozen, serve it within 24 hours after thawing or throw it away.

### **Waste products.**

Waste products are not stored in any storage area.

### **Your responsibility in the work place**

Although employees have a legal obligation to ensure health, safety and security within the workplace, employees, colleagues and other persons are also responsible for taking these issues in hand.

Any health safety, hygiene and security issue such as burnt hand or a case of food poisoning must be reported immediately to the seniors in a recorded manner with the following columns

- Date and time of accident
- Name of the person
- Nature and cause of accident
- Who were present nearby?
- Reason of cause ( if possible)

Any remedial action if required

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## 2.10 CONVERSION TABLES

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CONVERSION TABLE

Metric	Imperial	American
5 ml	1 / 6 fl oz	1 teaspoon
10 ml	1 / 3 fl oz	1 dessertspoon
15 ml	1 / 2 fl oz	1 tablespoon
60 ml	2 fl oz	1 / 4 cup (4 tablespoons)
85 ml	2 1/2 fl oz	1 / 3 cup
90 ml	3 fl oz	3 / 8 cup (6 tablespoons)
125 ml	4 fl oz	1 / 2 cup
180 ml	6 fl oz	3 / 4 cup
250 ml	8 fl oz	1 cup
300 ml	10 fl oz (1/2 pint)	1 1/4 cups
375 ml	12 fl oz	1 1/2 cups
435 ml	14 fl oz	1 3 / 4 cups
500 ml	16 fl oz	2 cups
625 ml	20 fl oz (1 pint)	2 1/2 cups
750 ml	24 fl oz (1 1/5 pints)	3 cups
1 litre	32 fl oz (1 3/5 pints)	4 cups
1.25 litres	40 fl oz (2 pints)	5 cups
1.5 litres	48 fl oz (2 2/5 pints)	6 cups
2.5 litres	80 fl oz (4 pints)	10 cups

Fig.2L

<b>OVEN TEMPERATURES</b>			
<b>°C</b>	<b>°F</b>	<b>Gas Mark</b>	<b>Temperature</b>
130	250	½	very cool
140	275	1	very cool
150	300	2	cool
170	325	3	warm
180	350	4	moderate
190	375	5	fairly hot
200	400	6	fairly hot
220	425	7	hot
230	450	8	very hot
240	475	9	very hot

<b>WEIGHT and CAPACITY EQUIVALENTS</b>					
<b>Imperial</b>	<b>=</b>	<b>Metric</b>	<b>Imperial</b>	<b>=</b>	<b>Metric</b>
1 oz	=	28g	2 fl oz	=	56ml
2 oz	=	57g	3 fl oz	=	85ml
3 oz	=	85g	5 fl oz (¼ pint)	=	142ml
4 oz	=	113g	½ pint	=	284ml
8 oz (½ lb)	=	227g	1 pint	=	568ml
16 oz (1 lb)	=	454g	1¾ pints	=	1 litre
2 pints	=	1.13 litres	2½ pints	=	1.42 litres
4 pints	=	2.27 litres			

**Fig. 2M**

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**CHECK YOUR PROGRESS EXERCISE -II**

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1) What are the principles of HACCP?

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2) What are the benefits of HACCP?

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3) What are the different types of food hazards?

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## 2.11 SUMMARY

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The chapter has aimed to identify the principles, practices and applications of food production in the food service industry; Inherent in the process is the hygienic management concept necessary to deliver a clean, safe and healthy product all the time. It has focused on the knowledge required by a manager to operate and manage a food production system efficiently. This knowledge is gained through an understanding of the basic principles of menu-planning and food production system, which is also, linked to the purchasing and storage processes. As with every manufacturing system, standardization is essential to maintain the consistency of the products within the financial constraints, and therefore the chapter has also attempted to demonstrate the principles and importance of operational control.

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## 2.12 GLOSSARY

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1. **Bainmarie**- a hot water bath on which food in containers are kept during buffet service.
2. **Blow Torch** - it is an equipment used for browning the outer surface of food like in au-grating dishes.
3. **Reach-in** – are electrically operated cool cabinets with temperature ranging from 40C to 240C. It has transparent glass mirror on one side so that one can view the items placed in it. It is generally placed in confectionary, sweet shops, salad bars etc.
4. **Clam knife-Short, rigid, broad** –bladed knife with a slight edge. Used for opening clams.
5. **Pallet** - A flat, long flexible blunt knife basically used in bakery of spreading icings.
6. **China cap**- It is a cone shaped strainer used to strain soups, stocks, sauces etc.
7. **Brazier**- It is a round, broad, shallow, heavy-duty pot with straight sides. Used for browning, braising, and stewing meats.
8. **Contamination**- contact or mixing of foreign organisms with food.
9. **Thawing**- a process of bringing frozen food to normal temperature.

10. **Fumigation**- is a method of pest control that completely fills an area with gaseous pesticides.
11. **CCP**- Critical control point.

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## 2.13 CHECK YOUR PROGRESS-I ANSWERS

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A.1 Equipments can be classified into:

A. Heat generating

- a) Heavy equipments- gas ranges, ovens, salamanders, proving chamber, broiler etc.
- b) Light equipments- Toaster, sandwich griller, blow torch, sizzler plate, induction cooker etc.

B. Cold generating

- a) Heavy equipment- refrigerator, walk-in, reach-in, freezer etc.
- b) Light equipment- bottle chiller, mini room fridge et.

C. Other

- a) Heavy equipment- potato peeler, dish washing machine, dough mixture, plate warmer etc.
- b) Light equipment- mixer, grinder, juicer, chopper, blender etc.
- c) Hand tools- knives, peelers, spatula, chef tong, china ap thermometer etc.

A.2 Modern cooking and food processing equipment has an extraordinary capacity to burn, cut, smash, mangle, and amputate various parts of the tender human body. This may sound like a harsh way, but the intent is not to intimidate you or scare you but to inspire a healthy respect for the importance of proper safety and operating producers. Never use a piece of equipment until you are thoroughly familiar with its operation and all its features. Do not haste in working, neither do let any of your colleagues do so. Always be cool and calm with the equipments you are working with. You must also learn how to know when a machine is not operation correctly. When this happens, shut it down immediately and report the malfunction to a supervisor.

A.3 Toaster, sandwich griller, blow torch, sizzler plate, induction cooker

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## 5.14 CHECK YOUR PROGRESS-II ANSWERS

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1. The aim and objective of pest control is:-

- h) To minimize the number of pests.
- i) To minimize the images, inconvenience and distress they cause.
- j) Eliminate the human diseases they may transmit.
- k) We can design constant and maintain building in such a way that pest are denying and harbourage.
- l) We can store food stuff and disposed of waste in such a way as to deny food supply to paste.
- m) We can apply various chemicals to kill the pest.
- n) We can and must educate people in or in other activities.

2. HACCP is based on seven principles which are:

1. Conduct a Hazard Analysis
2. Determine Critical Control Points

3. Establish Critical Limits
4. Establish Monitoring Procedures
5. Establish Corrective Actions
6. Establish Verification Procedures
7. Establish Record Keeping and Documentation Procedures

3. The different types of food hazards are:

1. Biological agents
  - Bacteria and their toxins
  - Parasites
  - Viruses
2. Physical Objects
  - Bandages
  - Jewelry
  - Stones
  - Glass
  - Bone and metal fragments
  - Packaging materials
3. Chemical Contamination
  - Natural plant and animal toxins
  - Unlabeled allergens (allergen-causing protein)
  - Nonfood-grade lubricants
  - Cleaning compounds
  - Food additives
  - Insecticides

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## 2.15 REFERENCE/BIBLIOGRAPHY

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## 2.16 TERMINAL QUESTIONS

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**Short answer type questions:**

1. What are the benefits of HACCP?
2. Write a note on knives used in the kitchen.

3. What are the general points one has to remember while caring kitchen equipments?
4. What are the points one must consider while purchasing equipments?
5. What are the precautions taken while cooking food in microwave?
6. How food is thawed?
7. What is the food safety involved while storing food ?
8. Name 5 heat generating and 5 cold generating equipments used in kitchen?
9. Compare the use of microwave cooker over broiler.
10. What is the difference between roasting pan and sauté pan?
11. What is the difference between tandoor and grill?

**Write short notes on:**

1. Ovens
2. Overhead infra red lamps
3. Induction cook top
4. Care and maintenance of deep freezer.
5. Walk-in
6. Food measuring devices
7. Non-stick cook wares
8. Grills
9. Critical control point
10. SQF

**Long answer type questions**

1. How Food production area can be made free from infestation? Elaborate.
2. Classify kitchen equipments and write in detail the maintenance of any 5 of them.
3. Discuss the conductivity of metal used in cooking purpose.
4. Discuss elaborately about food hygiene to be adopted in kitchen.
5. What are the principles of HACCP? Why is it important in food service organization?
6. Write in detail about small equipments and hand tools used in kitchen.
7. Personal hygiene is important for people working with food, why? Explain.
8. What are the hazards that can occur while holding cooked food?
9. Discuss in detail the food transport, holding, and serving hazard and control rules.
10. Name and discuss the use of at least 10 small tools used in kitchen.



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## UNIT-3

# METHODS OF COOKING

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### STRUCTURE

- 3.1 Introduction
- 3.2 Objective
- 3.3 Methods of heat transfer
- 3.4 Principles of cooking
- 3.5 Classification of cooking
- 3.6 Basic preparation
  - 3.6.1 Mise en place: the required tasks
  - 3.6.2 Preliminary cooking and flavoring
  - 3.6.3 Kinds of marinades
  - 3.6.4 Preparation for frying
- Check your progress-I
  - 3.6.5 Measuring ingredients
  - 3.6.6 Mixing techniques
- 3.7 Stocks
  - 3.6.1 Principles of Stock Making
- 3.8 Sauce
- 3.9 Egg preparations
- Check your progress-II
- 3.10 Summary
- 3.11 Glossary
- 3.12 Check your progress-I answers
- 3.13 Check your progress-II answers
- 3.14 Reference/bibliography
- 3.15 Terminal question

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## 3.1 INTRODUCTION

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In the previous chapter we have learnt the different kinds of equipments used in kitchens, along with their characteristics, care and maintenance. We also learnt the importance of hygiene and sanitation required by the kitchen workers and their duties towards maintenance of cleanliness and sanitization of the working area. In this chapter we are going to learn the different techniques of cooking food and all the preparations required to make a complete dish.

One of the first steps in learning how to cook is learning the proper cooking methods. There are many to learn, and they each have their advantages and disadvantages. You'll begin to notice a trend when it comes to applying cooking methods to various food items. Generally, you'll notice moist-heat methods used to help keep foods moist and to prevent drying out. Moist-heat cooking methods are also used to cook food items that would be too tough to enjoy if prepared using a dry-heat method. These items typically need longer cooking time and to ensure they don't dry out, a moist heat cooking method would be applied.

Practicing these types of cooking methods is the only way to become naturally adept with them. You are probably already aware of many of these methods and

unknowingly use them on a regular basis. What the goal is to make sure that you are applying the proper cooking technique to the proper food item. While cooking is usually seen as empty canvases in which to experiment with, you must first master the theory and practical skills that gives the canvas its inspirational ability. One of those things happens to an important foundational skill, and one that you can't afford to be without.

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## 3.2 OBJECTIVE

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The main objective of this lesson is to teach and inculcate the following among the budding professionals:

- How to handle heat carefully while cooking food.
- To provide the basic idea of cooking methods involved in preparing a dish.
- Use of latest technology
- To give knowledge about food and cooking method applied
- To elucidate the preparations required before actual cooking

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## 3.3 METHODS OF HEAT TRANSFER

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**Methods of heat transfer:** In order the food to be cooked, heat must be transferred from the heat source (such as a gas flame or an electric element) to and through the food. Understanding the ways in which heat is transferred and the speed at which it is done helps the cook to control the cooking process. Heat is transferred in three ways- conduction, convection and radiation.

1. **Conduction:** Conduction occurs in two ways –
  - a) When heat moves (conducts) directly from one item to the other, which is in contact with it. For example from the top of the range to a pot placed on it, from the pot to the milk inside etc.
  - b) When heat moves from one part to an adjacent part of the same item. For example from the exterior of a roast to the interior, or from a sauté pan to its handle. Different metals (materials) conduct heat at different rates (speeds) Heat moves rapidly through copper and aluminum, more slowly in stainless steel, slower yet in glass and porcelain. Air is a very poor conductor of heat.
2. **Convection:** Convection occurs when the movements of air, steam, or liquid (including hot fat) spreads heat. There are two kinds of convection
  - a) **Natural-**Hot liquids and gases rise, while cooler ones sink. Thus in any oven, kettle of liquid, or deep fat fryer there is a constant, natural circulation that distributes heat.
  - b) **Mechanical-**In convection ovens and convection steamers, fans speed the circulation of heat. Thus, heat is transferred more quickly to the food, and the foods cook faster. Stirring is a form of mechanical convection. Thick liquids cannot circulate as quickly as thin ones, so the rate of natural convection is slower. This explains in part why it is so easy to scorch thick soups and sauces.

**3. Radiation (cooking by radiant heat):** Radiation occurs when energy is transferred by waves from the source to the food. The waves themselves are not actually heat energy, but are changed into heat energy when they strike the food being cooked. (Light waves, radio waves, and X – rays are examples of radiation not used for cooking) Two kinds of radiation are used in the kitchen:

- a) **Infra-red** Broiling is the most familiar example of infra -red cooking. In a broiler, an electric element or a ceramic element heated by a gas flame becomes so hot that it gives off infra red radiation, which cooks the food. There is also high-intensity infra red ovens designed to heat food rapidly.
- b) **Microwave** In microwave cooking, the radiation generated by the oven penetrates part way into the food, where it agitates the molecules of water. The friction caused by this agitation creates heat, which cooks the food, i) because microwave radiation affects only water molecules, a completely waterless material will not heat up in a microwave oven. Plates become hot only when heat is conducted to them by hot foods. ii) because most microwaves penetrate no more than about 2 inches into foods, heat is transferred to the centre of large pieces of food by conduction, just as in roasting.

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### 3.4 PRINCIPLES OF COOKING

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**Heat Management:** The final temperature to which we cook a food ranges from about 120°F (49°C) for rare meats and fish to about 400°F (200°C) for the crisp exterior of such foods as breads and seared meats. The boiling point of water, 212°F (100°C), falls within this range. Notice, however, the heat sources we use in the kitchen, from electric elements to gas flames, are much hotter than this temperature. Managing the heat to cook foods to the desired degree is an important part of cooking. In the discussion that follows, we first consider cooking time—that is, the time it takes to heat food until it changes to a condition that we call done. We then look at other problems with controlling heat in cooking.

#### **Doneness and Cooking Times:**

We say a food is “done” when two things have happened:

**1. The interior temperature** has risen to the desired degree. Interior temperature is the most important factor when we are cooking tender meats. The difference between rare, medium, and well done (see p. 298) is a difference in temperature, and we can measure this doneness with a thermometer.

**2. The desired changes** have taken place in the food. Earlier in this chapter, we discussed the changes that take place in foods as they are heated. These changes include gelatinization of starches, coagulation of proteins, breaking down of connective tissues, caramelization of sugars, and Maillard browning.

In many foods, creating these changes is more important than simply heating the interior to a desired temperature. For example, the inside of a small piece of stew meat quickly becomes just as hot as the liquid in which it is simmering. However, we don't say it is “done” until enough connective tissue has broken down so it has a tender texture. It's not enough just to heat it to the desired degree. Similarly, the inside of a strand of spaghetti quickly rises to the temperature of boiling water, but it is not done

until enough starch has absorbed water and gelatinized, so it has the desired texture. Standards of doneness are different for every type of food and for every cooking method. As we discuss individual foods throughout the remainder of this book, we learn more about doneness in meats, poultry, fish, vegetables, starches, and other foods. The time it takes to achieve doneness is affected by three factors:

**a. Cooking temperature:** This means the temperature of the air in the oven, the fat in the fryer, the surface of a griddle, or the liquid in which a food is cooking.

**b. The speed of heat transfer:** Different cooking methods transfer heat at different rates, as shown by these examples:

Air is a poor conductor of heat, while steam is much more efficient. A jet of steam (212°F/100°C) will easily burn your hand, but you can safely reach into an oven at 500°F (260°C). This is why it takes longer to bake potatoes than to steam them. A convection oven cooks faster than a conventional oven, even if both are set at the same temperature. The forced air movement transfers heat more rapidly.

**c. Size, temperature and individual characteristics of the food:** For example: A small beef roast cooks faster than a large one. A chilled steak takes longer to broil than one at room temperature. Fish items generally cook more quickly than meats. Beef shank, which has a lot of connective tissue, takes longer to cook than beef tenderloin.

Because there are so many variables, it is difficult or even impossible to determine exact cooking times in most recipes. Individual ovens, fryers, and steamers, for example, may transfer heat more or less efficiently or have different recovery times. Roasting charts that give cooking times for various cuts of meat can be used only as guidelines, and the cook must use his or her judgment to make the final determination of doneness.

### Cooking times

It takes time to heat a food to a desired temperature, the temperature at which a food is said to be “done” (meaning that the desired changes have taken place). This time is affected by three factors.

**1. Cooking temperature-** This means the temperature of the air in the oven, the fat in the fryer, the surface of a griddle, or the liquid in which a food is cooking.

**2. The speed of heat transfer** Different cooking methods transfer heat at different rates, as shown by these examples: Air is a poor conductor of heat, while steam is much more efficient. Jets of steam (212°F/100°C) will easily burn your hand, but you safely reach into an oven at 500°F (260°C). This is why it takes longer to bake potatoes than to steam them. A convection oven cooks faster than a conventional oven, even if both are set at the same temperature. The forced air movement transfers heat more rapidly.

**3. Size, temperature, and individual characteristics of the food.** For example, a small beef roast cooks faster than a large one. A chilled steak takes longer to broil than one at room temperature. Fish items generally cook more quickly than meats. Because there are so many variables, it is difficult or even impossible to determine exact cooking times in most recipes.

**Cooking to the center:** As we read earlier, heat is transferred from the outside of food to the inside by conduction.

Conduction takes time, so cooking takes time. Think of a steak cooking on a grill. Let's say we want to cook the steak to an interior temperature of 140°F (60°C), for medium doneness. When we first put the steak on to cook, the interior temperature is room temperature, or possibly refrigerator temperature. The outside, however, rises to perhaps 400°F (200°C) very soon after we place it on the grill. Gradually, this heat moves to the center. By the time the center reaches the target temperature, the outside is much hotter. If we cut the steak through the center, we see a gradation from very well done at the outside to medium done in the middle.

Often this is just what we want. This is how people are used to eating steaks, so a person might be surprised to get a steak that was a uniform medium done all the way through. By contrast, if we cook the steak at a low temperature, there is less temperature difference between the outside and inside, so the doneness of the meat is more uniform from outside to inside. The same is true of large roasts. Roasting at a high temperature produces a strong gradation of doneness, from well done on the outside to less done in the center. Roasting at a low temperature gives more uniform doneness throughout. The roasting temperature we use depends on the results we want. Of course, cooking at a low temperature doesn't create the well-browned crust most diners desire. We have two options to solve this problem:

- Brown the exterior with high heat, then cook to doneness at lower heat.
- Cook to doneness at low heat, and then brown the exterior with a quick blast of high heat.

### Controlling Heat

To control cooking, we must control how heat is transferred. The kitchen contains dozens of kinds of heat sources as well as a great array of pots, pans, and other cooking tools. Controlling cooking with so many options is a skill a cook gains with experience, by performing cooking tasks over and over. In this section, we introduce the topic of heat management with a summary of two of the most common kinds of heat control problems.

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## 3.5 CLASSIFICATION OF COOKING

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Different cooking methods are suited to different kinds of foods. For example meats high in connective tissue will be tough hence should be broken down slowly by moist heat. Meats, low in connective tissue, are naturally tender and they are at their best and juiciest when cooked with dry heat to rare or medium- done stage. There are many other factors to consider when choosing methods of cooking for meats, fish, and vegetables, such as the flavor and appearance imparted by browning, the flavor imparted by fats, and the firmness or delicacy of the product.

Cooking methods are broadly classified as “dry heat method” “moist heat method” combination of both and other method. (Fig. 3A)

### 1. 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. We usually divide dry heat methods into two categories: without fat (i.e. using air) and with fat.

- a) **Baking:** The food to be cooked is surrounded by hot air in a closed oven. The action of dry heat is modified by the steam, which arises from the food whilst cooking. Bread, cakes, puddings and vegetables may be cooked by this method.

- b) **Broiling:** Broiling is cooking by direct heat and is used synonymously with grilling. In pan broiling the food is cooked uncovered on hot metal as a grill or a frying pan. The pan or grill is oiled slightly to prevent sticking. Excess fat accumulated while cooking should be paused off. The foods which are generally boiled are cumin seeds, aniseeds etc.
- c) **Grilling:** This is cooking by dry heat and is carried on a grid iron over the fire (over-heat) or on a grid placed in tin under electric or gas grill (under-heat) or between electrically heated grill bars (between-heat). Overheat e.g. Bar-be-que.

To cook with a covering of buttered crumbs or grated cheese until a crust or crisp surface forms. Au gratin is a term familiar to most of us and we usually think of it as having cheese melted over the top of a dish and then browned. In fact, the proper use of the term means to crumbs combined with a high fat product such as butter, cream, cheese or eggs for the topping. The crumbs may consist of breadcrumbs, crushed potato chips, crushed crackers, or even corn flake crumbs.

To prepare a dish au gratin, place the product in a dish, top with gratin and then place the dish under a salamander or in the oven, with a high heat, 475° to 550°F, until a golden brown crust forms. Larger slices of product like meat or fish, and items with a high moisture content like tomatoes, must be done at a lower heat for a longer time to insure they have the proper doneness when they reach the right gratin brown.

- d) **Roasting:** Roasting is cooking food over dry hear source. It is of two types:

(a) **Spit roasting:** The food to be cooked is brought in contact with direct flame in front of a clear bright fire. The food is basted over with fat and is also turned regularly to ensure even cooking and browning. This method, known as spit roasting, is very little used, as only good quality meats are suitable. Roast meat, done by this method, however, has a very good flavour and still served in large hotels and in special restaurants and hostels e.g. Barec meat.

(b) **Pot roasting:** This method is used to cooks mall joints and birds if no even are available but a thick heavy pan is essential. Enough fat is melted to cover the bottom of the pan. When the fat is hot the joint is browned. It is then lifted on 2 or 3 skewers in order

to prevent the joint from sticking to the pan. The pan is then covered tightly with a well fitting lid and cooked over a very slow fire. T his method is applied for small joints and birds.

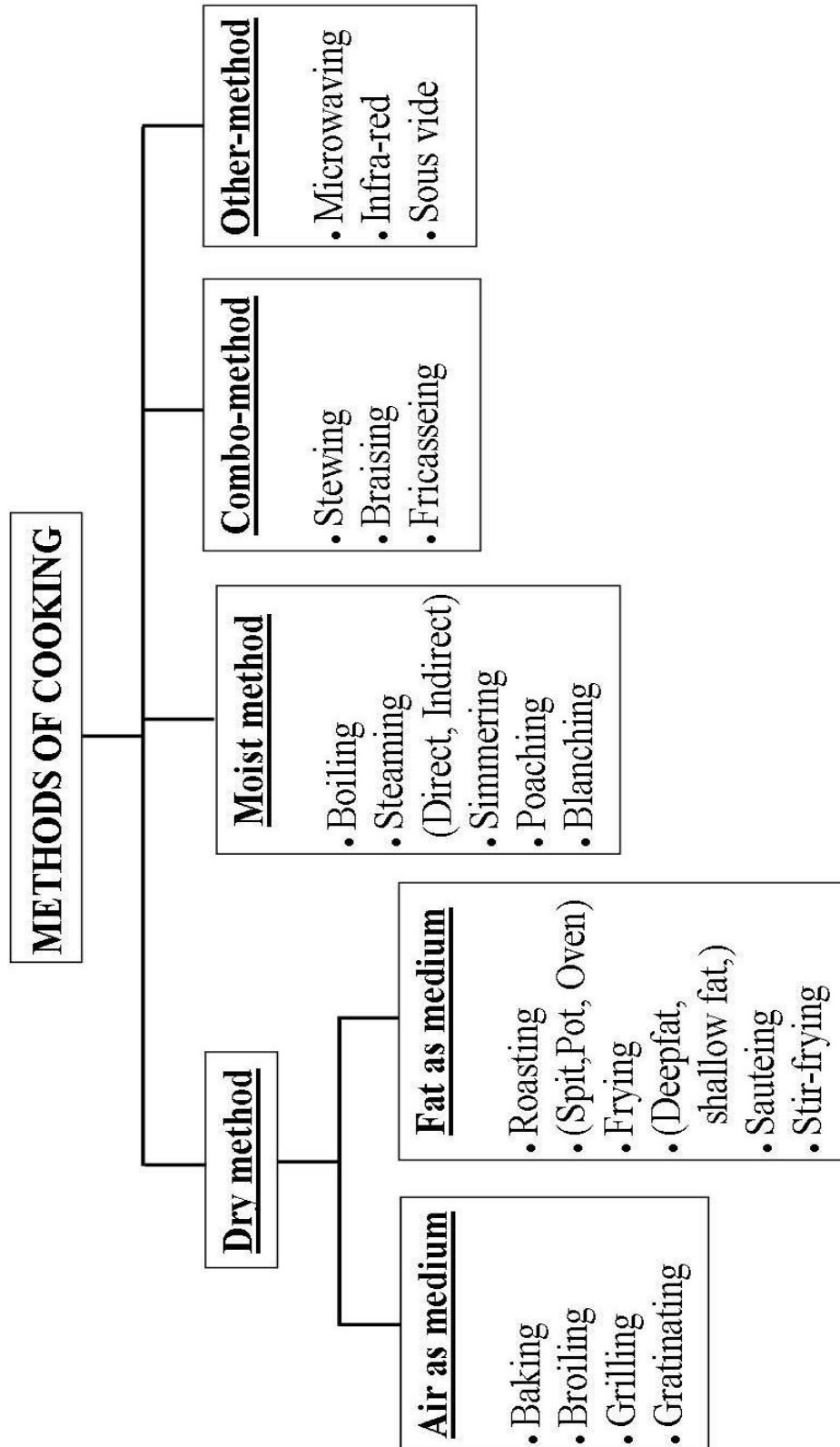


Fig. 3A

(c) **Oven roasting:** This has now taken the place of spit roasting because of its convenience, although only first class meat, poultry and vegetables are thus cooked. This is cooking in a closed oven with the aid of fat. The joint is raised out of fat by means of trivet or bones to prevent the meat from frying and becoming hard. Frequent basting however is necessary. The food is put into a fairly hot oven (300<sup>0</sup> F) for 5 to

10 mts. And the temperature is lowered to allow the joint to the cooking through thus producing a better-cooked joint than it would have been cooked at higher temperature. Also the shrinkage is less, thereby yielding more portions.

- e) **Frying:** This is a method of cooking whereby the food to be cooked is brought in contact with hot fat. Food cooked in this way is thought to be indigestible but if the method is correctly and carefully carried out, the food is quite suitable for normal people. There are two types of frying:
- (a) Deep fat frying
  - (b) Shallow fat frying

**(a) Deep fat frying:** The food is completely immersed in hot fat and, therefore, a large quantity of fat is required. The correct temperature of fat is a very important part of this method of frying. If the fat is overheated it spoils both the food and fat while if it is not hot enough the food breaks up thereby absorbing fat and thus making it unfit for consumption. Almost all foods require a coating before they are to be fried because not only the juices and flavour of the food are to be kept in put the fat must be kept out. The materials used are:

- i) Egg and bread crumbs
- ii) Flour & milk (not suitable for deep fat frying)
- iii) Flour Batter
- iv) Besan Batter
- v) Flour (Sheaved-ones)

**(b) Shallow fat frying:** In this method, very little fat is used and the food to be cooked is turned over so that both sides are cooked. Generally this method is applied to precooked food unless the food takes very little time to cook (omelets, liver etc.). Some foods contain sufficient fat and additional fat is not necessary e.g. bacon. In this case it is known as “Fatless frying”.

- f) **Sauteing:** It is frying rapidly on heat applying little amount of oil.  
g) **Stir frying:** It is frying rapidly on fierce heat applying little amount of oil.

## 2. Moist heat methods

Moist heat methods are those in which the heat is conducted to the food product by water (including stock, sauces gravies etc.) or by steam.

- 1) **Boiling:** Food to be cooked by this method is surrounded with boiling liquid (100<sup>0</sup>C). Only just sufficient liquid should be used to cover the article to be cooked.
- 2) **Steaming:** The food to be cooked is surrounded by plenty of steam from fast boiling water (e.g. pomnes vapeur) or by having the food in a basin or other dish placed in steam or boiling water (e.g. to cook in Bain Marie). It is of two types:
  - a) Direct steaming- where the food to be cooked is directly in contact to the vapour.
  - b) Indirect steaming- where the food to be cooked is not directly in contact to the vapour
- 3) **Simmering:** This is another moist method of cooking which involves convection to transfer heat from the liquid to the food. For simmering the food id submerged



in the liquid at temperature between 85-96<sup>0</sup>C. Since the temperature is higher than poaching, so more bubbles can be seen breaking on the top.

- 4) **Poaching:** Poaching is cooking slowly in a minimum amount of liquid, which should never be allowed to boil but should be just off boiling (71-82<sup>0</sup>C). Fish, fruits and eggs are poached. When poaching eggs, vinegar and salt are added to the liquid to help quicker coagulation and thus prevent disintegration.
- 5) **Blanching:** Blanching is a cooking process wherein the food substance, usually a vegetable or fruit, is scalded in boiling water, removed after a brief, timed interval, and finally plunged into iced water or placed under cold running water (shocking or refreshing) to halt the cooking process. Blanching may be used to preserve color and texture, to prepare ingredients ahead of time, and to prepare vegetables for freezing.

### 3. Combo-method

This is also called combo method, in which both dry method and moist method of cooking is involved:

a) **Stewing:** This is a very gentle method of cooking in a closed pan using only a small quantity of liquid. The food should never be more than half covered with the liquid and the food above this level is really cooked by steam. As the liquid is not allowed to boil, the cooking process is a slow one. Never boil a stew for "a stew boiled is a Stew spoiled". In this type of cooking the cheaper, older and coarser types of meat and poultry are cooked.

b) **Braising:** This is a combined method of roasting and stewing in a pan with a tight fitting lid. The meat should be sealed by browning on all sides and then placed on a bed of root vegetables. Stock or gravy should come to 2/3<sup>rd</sup> of the meat. The flavorings and seasonings are then added. The lid is put on and it is allowed to cook gently on the stove or in the oven. When nearly done the lid is removed and the joint is frequently basted to glaze it. This latter process is always done in the oven.

c) **Fricasseeing or fricassee:** This is a method of cooking meat in which it is cut up, sautéed and braised. The meat is sautéed in a pan to seal the edges and sides and then braised while stirring. In this method the texture of the food item remains in its original shape. Food items are then served with a sauce, preferably white Bechamel.

### 4. Other methods of cooking

- a) **Microwave cooking:** In this type of cooking, the radiation generated by the oven penetrates part way into the food, where it agitates the molecules of water. The friction caused by this agitation creates heat, which cooks the food-
  - i) Because microwave radiation affects only water molecules, a completely waterless material will not heat up in a microwave oven. Plates become hot only when heat is conducted to them by hot foods.
  - ii) Because most microwaves penetrate no more than about 2 inches into foods, heat is transferred to the centre of large pieces of food by conduction, just as in roasting.

- b) **Infra-red cooking:** Infra-red cooking is the latest way of cooking involving less energy and hazard. In a broiler, an electric element or a ceramic element heated by a gas flame becomes so hot that it gives off infra red radiation, which cooks the food. There is also high-intensity infra red ovens designed to heat food rapidly. Infrared can be used in cooking and heating food as it predominantly heats the opaque, absorbent objects, rather than the air around them.
- c) **Sous-vide cooking:** Sous-vide cooking-is a method of food preparation where the prepared food is cooked in a sealed plastic pouch from which all or much of the air has been removed to prevent oxidation of the food. This is different from the preparation of “boil in bag” products, which are cooked and portioned before being sealed in plastic bags. The fresh food is prepared or par-cooked under strict hygienic conditions and placed into a specially designed vacuum packing machine, where the neck is sealed. Cooking is done under controlled temperature in convection ovens between 70<sup>0</sup>C to 100<sup>0</sup>C. Sous –vide cooking is suitable for Hospitals, railway catering, flight catering, cruise lines etc.

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### 3.6 BASIC PREPERATION

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To be successful in the food service industry, cooks need more than the ability to prepare delicious, attractive, and nutritious foods. They also must have a talent for organization and efficiency. In every kitchen, a great many tasks must be completed over a given time and by a limited number of workers. No matter when these tasks are done, they all must come together at one crucial point: service time. Only if advance preparation is done thoroughly and systematically will service go smoothly.

Good chefs take pride in the thoroughness and quality of their advance preparation, (mis en scene or mis-en place). This French term, meaning “everything put in place,” has become almost a professional password all the kitchens world-wide because food service professionals understand its importance to the success of the establishment.

So what is the difference between them?

Mis-en-scene refers to the entire environment of working, where the kitchen as a whole has to be ready for the work to begin. The entire work place has to be made comfortable and presentable so that when a chef starts his work for the day, he feels that the area has been made for him to work. He should feel pride and satisfied while working. This will help in maximum input from the workers for producing maximum output for the day.

**Mis-en-scene:** Mis-en scene refers to the preparing the environment of the area in order to make it pleasant, comfortable safe and hygienic and easy to work. For a chef the kitchen is the service area before each session of work, the kitchen has to be made presentable enough to enable the workers to work comfortably without becoming fatigue. The initiation of mis- en place starts with the kitchen stewarding department under whom the various cleaning, washing and wiping takes place. After each session of work (shift), the supervisor ensures that the kitchen has to be washed and cleaned properly and the equipments, cutlery and crockery and other hand tools are kept properly for instant use by the chefs. The following is the itenary for mis-en-scene of kitchen:

All the racks, working tables, sinks, storage area are cleaned, wiped and disinfected.

1. The entire floor has to be flush cleaned.

2. The tiles on the walls are cleaned.
3. All the equipments are stacked properly and cleaned and wiped along with their parts.
4. The entire cutlery, crockery, hollow ware, china ware are to be cleaned
5. All pots and pans to be cleaned.
6. The gravies, sauces, soups or any leftover item has to be checked and stored.
7. The store items has to be checked and requisitions has to be made for procurement.
8. Counters and under-tables have to be checked for any leftover food items.
9. Preparation for the forthcoming event has to initiate.
10. All gas ranges, cooling cabinets and electrical points should function properly.

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### 3.6.1 MISE EN PLACE: THE REQUIRED TASKS

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Up to this point, we have discussed planning the production schedule. Our planning helps we determine what tasks we must do before beginning the final cooking during the meal service period. Chefs refer to performing these preliminary tasks as “doing the mis en place” or “putting everything at place”. In many restaurants, especially large ones, the mis en place is extensive. It includes the preparation of stocks, sauces, breadings, and batters as well as the cutting and trimming of all the meat, poultry, fish, and vegetables the chef expects will be needed during the meal service. A large part of a cook’s workday is spent doing mis en place. This means that a large part of learning how to cook is learning how to do mis en place. In fact, a large part of this book is devoted to these tasks of preparation. There are many more such tasks than can be included in a single chapter. The remainder of this chapter discusses the most basic and general skills required for a mis en place.

Planning and organizing production recipe, you must first:

- Assemble your tools.
- Assemble your ingredients.
- Wash, trim, cut, prepare, and measure your raw materials.
- Prepare your equipment (preheat oven, line baking sheets, etc.).

Only then can you begin the actual preparation.

When many items are to be prepared in a commercial kitchen, the situation is much more complex. Dealing with this complexity is the basis of kitchen organization.

**The problem:** Every food service operation faces a basic conflict between two unavoidable facts:

1. There is far too much work to do in a kitchen to leave until the last minute, so some work must be done ahead.
2. Most foods are at their best quality immediately after preparation, and they deteriorate as they are held.

**The solution:** To address this conflict, the chef must plan the pre-preparation carefully. Planning generally follows these steps:

1. Break down each menu item into its stages of production. Follow the recipe.

Note that the procedures are divided into a sequence of steps that must be done in a certain order to make a finished product.

2. Determine which stages may be done in advance.
  - The first step of every recipe, written or not, is always part of advance preparation: assembling and preparing the ingredients. This includes cleaning and cutting produce, cutting and trimming meats, and preparing breadings and batters for frying.

- Succeeding steps of a recipe may be done in advance if the foods can then be held without loss of quality.
- Final cooking should be done as close as possible to service for maximum freshness.

Frequently, separate parts of a recipe, such as a sauce or a stuffing, are prepared in advance, and the dish is assembled at the last minute. In general, items cooked by dry-heat methods, such as broiled steaks, sautéed fish, and French-fried potatoes, do not hold well. Large roasts are an important exception to this rule. Items cooked by moist heat, such as braised beef, soups, and stews, are usually better suited to reheating or holding in a steam table. Very delicate items should always be freshly cooked.

3. Determine the best way to hold each item at its final stage of pre-preparation. Holding temperature is the temperature at which a product is kept for service or for storage. Holding temperatures for all potentially hazardous foods must be outside the Food Danger Zone.
  - Sauces and soups are frequently kept hot, above 135°F (57°C), for service in steam tables or other holding equipment. Foods such as vegetables, however, should be kept hot only for short periods because they quickly become overcooked.
  - Refrigerator temperatures, below 41°F (5°C), are best for preserving the quality of most foods, especially perishable meats, fish, and vegetables, before final cooking or reheating.
4. Determine how long it takes to prepare each stage of each recipe. Plan a production schedule beginning with the preparations that take the longest.
5. Many operations can be carried on at once because they don't all require your complete attention the full time. It may take 6 to 8 hours to make a stock, but you don't have to stand and watch it all that time.
6. Examine recipes to see if they might be revised for better efficiency and quality as served.

For example:

- Instead of preparing a full batch of green peas and holding them for service in the steam table, you might blanch and chill them, then heat portions to order in a sauté pan, steamer, or microwave oven.
- Instead of holding a large batch of butter chicken in makhani gravy sauce in the steam table, you might prepare and hold the sauce, roast the chicken to order, combine the meat with a portion of the gravy, and serve fresh from the pan.

Caution: Unless you are in charge of the kitchen, do not change a recipe without authorization from your supervisor.

### **The goal**

The goal of pre-preparation is to do as much work in advance as possible without loss of quality. Then, at service time, all energy can be used for finishing each item immediately before serving, with the utmost attention to quality and freshness. Many preparation techniques in common use are designed for the convenience of the cooks at the expense of quality. Remember, quality should always take highest priority.

### **Adapting preparation to style of service**

The way you plan production and do your *mis en place* depends in large part on the style of meal service. The following discussion of set meal service and extended meal service illustrates the basic differences.

**Set meal service**

- All customers eat at one time.
- Often called quantity cooking because large batches are prepared in advance.

Examples: school cafeterias, banquets, employee dining rooms.

The traditional method of set meal preparation, still widely used, is to prepare the entire quantity of each item in a single large batch and to keep it hot for the duration of the meal service. This method has two major disadvantages:

- Deterioration of quality due to long holding.
- Large quantities of leftovers.

Modern high-speed equipment, such as pressure steamers, convection ovens, infrared ovens, and microwave ovens, make possible a system called small-batch cooking. Needed quantities are divided into smaller batches, placed in pans ready for final cooking or heating, and then cooked only as needed. The advantages of this system are as follows:

- Fresher food, because it is not held as long.
- Fewer leftovers, because servings not needed are not cooked.

**Ala carte service**

Small-batch cooking also accommodates items prepared in advance and frozen or chilled for storage.

- Customers eat at different times.
- Often called à la carte cooking because customers usually select items from a written menu (carte in French).

•Examples: restaurants, short-order counters.

Individual items are cooked to order rather than cooked ahead, but pre-preparation is extensive, down to the final cooking stage. The short-order cook, for example, must have everything ready to go: cold meats, tomatoes and other sandwich ingredients sliced and arranged, spreads prepared and ready, hamburger patties shaped, garnishes prepared, and so on. If the cook has to stop during service to do any of these things, orders will back up and service will fall behind.

A steak that takes 10 minutes to broil may be cut and trimmed in advance, but broiling should be started 10 minutes before it is to be served.

Obviously, if the last step in a recipe is to braise the item for 1½ hours, one cannot wait until an order comes in before beginning to braise. An experienced cook can estimate closely how many orders will be needed during the meal period and prepare a batch that, ideally, will finish braising just when service begins.

Note the differences in these two methods for Chicken Chasseur. In both cases, the final product is chicken in a brown sauce with mushrooms, shallots, white wine, and tomatoes.

**1. Quantity method—Chicken Chasseur:**

- Brown chicken in fat; remove.
- Sauté shallots and mushrooms in same fat.
- Add flour to make a roux.
- Add white wine, tomatoes, brown stock, seasonings; simmer until thickened.
- Add chicken; braise until done.

**2. À la carte method—Chicken Chasseur:**

- Prepare Sauce Chasseur in advance; hold in bain-marie.
- For each order:
- Brown chicken in sauté pan; finish cooking in oven.
- Deglaze pan with white wine; reduce.

- Add one portion of sauce; add chicken and simmer briefly; serve.

The most basic of these are knife skills. Fundamentals such as how to hold the chef's knife how sharpen it and use it for fabricating food stuffs are discussed below:

**Using the knife:** Many kinds of laborsaving tools are available for cutting, chopping, and slicing fresh foods. The chef's knife or French knife, however, is still the cook's most important and versatile cutting tool. The knife is more precise than a machine. Unless you are cutting a large quantity, the knife can even be faster. Cleaning a large machine takes time. To get the best use out of your knife, you must learn to keep it sharp and to handle it properly.

**Keeping a sharp edge:** The Sharpening Stone

A stone is the best tool for sharpening a chef's knife. The best electric sharpeners do an excellent job of sharpening chef's knives, but many models wear away too much of your expensive knife without making a good edge. You may not be lucky enough to have ready use of a good electric sharpener, so it is important to know how to sharpen a knife on a stone.

Follow these guidelines:

1. Hold the blade at a constant 20-degree angle to the stone.
2. Make light, even strokes, and the same number on each side of the blade.
3. Sharpen in one direction only to get a regular, uniform edge.
4. Do not over-sharpen.
5. Finish with a few strokes on the steel (see next section), then wipe the blade clean.

**The Steel:** This tool is used not to sharpen the edge but to true the edge (to perfect it, or to smooth out irregularities) and to maintain the edge (to keep it sharp as it is used). Observe these guidelines for using the steel:

1. Hold the blade at a constant 20-degree angle to the steel, just as when using the stone. A smaller angle will be ineffective. A larger one will dull the edge.
2. Make light strokes. Do not grind the knife against the steel.
3. Make even, regular strokes. Alternate each stroke, first on one side of the blade, then on the other.
4. Use no more than five or six strokes on each side of the blade. Too much steeling can actually dull the blade.
5. Use the steel often. Then you will rarely have to sharpen the knife on the stone.

**Cutlery techniques:** It's important to know about the various aspects of heating foods, yet oft en food must be cut into smaller pieces before it can be heated. Thus, another basic pillar of food preparation is the knowledge and use of cutlery. The following sections cover their handling and the styles of cutting food. The techniques vary according to the type of knife selected, and selection depends on the task to be performed.

**Handling Knives:** The most frequently used knife is the chef's or French knife. The positioning of the grip and of the food under the blade both influence the degree of control and leverage a person has over the knife. A chef's knife should be firmly held with the base of the blade between the thumb and forefinger and the other fingers wrapped around the handle. While one hand grips the knife, the other hand must hold the food and guide it toward the blade. Curling the fingers of the guiding hand under

while holding the food allows the knuckles to act as a protective shield and keeps the fingertips away from the cutting edge. It is best to allow at least a half-inch barrier of food between the blades for different tasks. Light tasks such as cutting out the stem end of a tomato can usually be accomplished with the tip of the blade, or, even better, with a knife more suitable to small tasks, such as a paring knife. Heavy duties such as chopping off the tough base of a bunch of celery are better accomplished by making use of the weight and thickness found at the base of the blade. Most other cutting tasks are carried out using the center of the blade.

**Cutting Styles:** Uniformity is the usual goal in cutting food. It allows for even heating and gives food an appetizing appearance. Cutting styles include slicing, shredding, dicing (cubing), mincing, and peeling.

- **Slice.** To move the food under the blade while keeping the point of the blade firmly on the cutting board. The base of the knife is lifted up and down with a forward and backward motion
- **Julienne.** Sliced food can be further cut up, or julienned, resulting in delicate sticks that are usually 1 to 3 inches long and only 1/16 to 1/8 of an inch thick.
- **Shred.** To cut leaf vegetables into thin strips. This may be done by first rolling the leaves into cigar-like shapes and then cutting them into shreds. Hand shredders and food processors with different sizes of shredding blades may also be used.
- **Dice.** To cut food into even-size cubes.
- **Mince.** To chop food into very fine pieces. This is done by placing the holding hand on the tip of the knife and rocking the base up and down in short strokes while moving it across the food several times, and then repeating as necessary.
- **Peel.** To remove the skin. The peel and rind can be cut from an orange or any thick-skinned fruit by first cutting off in a circular fashion the top of the fruit's skin, then scoring the skin through to the flesh of the fruit in four places. The skin can then be peeled in segments down from the top. Fruits can also be peeled directly with a paring knife. Avocados can be stripped of their peel by cutting the avocado from stem to stem through to the pit. Each half is cupped in the
- Hands and twisted gently to separate the halves. The seed (nut) can be removed with the fingers or the tip of a sharp knife. At this point the avocado can be scooped out with a large serving spoon or peeled and sliced.

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

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

The following terms describe other cutting techniques:

- **Chop:** to cut into irregularly shaped pieces.
- **Concasser (con-cass-say):** to chop coarsely.
- **Mince:** to chop into very fine pieces.
- **Emincer (em-man-say):** to cut into very thin slices (does not mean "to mince").

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### 3.6.2 PRELIMINARY COOKING AND FLAVORING

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Advance preparation often requires certain precooking and flavoring of ingredients to make them ready for use in the finished recipe. On the most obvious

level, if a recipe for chicken salad calls for cooked, diced chicken, you must first cook the chicken before you can proceed with the recipe.

A complete cooking procedure, in such a case, is part of the *mis en place* or pre-preparation.

**Blanching and par-cooking:** Partial cooking is a significant part of advance preparation. It requires a degree of culinary skill and judgment to determine when and how much cooking is necessary or desirable. Partial cooking may be done by any moist-heat or dry-heat method. Those commonly used are simmering or boiling (parboiling), steaming, and deep-frying (especially for potatoes). The term blanching may mean any of these methods, but it usually implies very brief cooking.

There are four main reasons for blanching or par-cooking:

**1. To increase holding quality:** Heating helps preserve foods by:

- Destroying bacteria that cause spoilage.
- Destroying enzymes that discolor foods (as when potatoes turn brown) and help them deteriorate.

**2. To save time:** It takes less time to finish parboiled vegetables for service than it does to finish raw vegetables. Large batches of foods may be blanched and chilled, and individual portions then finished to order. Items such as roast duck, which take too long to cook completely to order, are often roasted half to three-quarters done, and then finished as the orders are received.

**3. To remove undesirable flavors:** Some variety meats and certain strong-flavored vegetables, such as rutabaga, are sometimes blanched to make them milder and more acceptable to the customer.

**4. To enable the product to be processed further:** For example, vegetables and fruits such as tomatoes and peaches, as well as some nuts, are blanched to loosen the skins for peeling.

Sweetbreads are blanched so they are firm enough for slicing and breading or other kinds of handling.

### Marinating

To marinate means to soak a food product in a seasoned liquid in order to:

- Flavor the product.
- Tenderize the product.

The tenderizing effect of the acids in the marinade is relatively small. It is still essential to match the proper cut of meat with the proper cooking techniques for greatest tenderness. The marinade can also serve as the cooking medium and become part of the sauce. Vegetable marinades, called vinaigrettes, are served cold with the vegetables as salads or hors d'oeuvres, without further cooking or processing. Marinades have three categories of ingredients:

**1. Oil:** Oil helps preserve the meat's moisture. Sometimes it is omitted, especially for long marinations, when the oil would only float on top, out of contact with the product being marinated. Tasteless vegetable oils are used when a neutral flavor is required. Specialty oils, such as olive oil, are used to add flavor to the item being marinated.



**2. Acid from vinegar, lemon juice, wine:** Acid helps tenderize protein foods. It carries flavors (its own and dissolved flavors from spices and herbs). Use caution when employing strong acids, such as vinegar and lemon juice. A marinade that is too acidic will partially coagulate the protein of the meat, making it seem partially cooked. When the meat is then cooked, its texture will not be as desirable. Strong acids can be used in marinades if they are used in small quantities or if the meat is marinated for only a few hours.

**3. Flavorings—spices, herbs, vegetables:** A wide choice is available, depending on the purpose. Whole spices release flavors more slowly, so they are more suitable for long marinations.

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### 3.6.3 KINDS OF MARINADES

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**1. Cooked:** Used when long keeping quality is important. Modern refrigeration has made cooked marinades less widely used. An advantage of cooked marinades is that spices release more flavor into the marinade when it is cooked.

**2. Raw:** Most widely used for long marination under refrigeration. For example, Sauerbraten

**3. Instant:** The range of flavors and purposes is wide. Used for marinating a few minutes up to several hours or overnight. For example, London Broil.

**4. Dry:** A dry marinade, also called a dry rub or a spice rub, is a mixture of salt, spices, and herbs that is rubbed or patted onto the surface of a meat, poultry, or fish item. In some cases, a little oil or a moist ingredient such as crushed garlic is mixed with the spices to make a paste. The item is then refrigerated to allow it time to absorb the flavors. The rub may be left on the item or scraped off before cooking. This technique is widely used for barbecued meats. For an example a dry rub being applied to a large cut of meat.

Dry marinades are an effective way to flavor meats. Naturally, because a dry marinade usually doesn't contain an acid, you can't expect it to produce the slight tenderizing effects of liquid marinades containing acids.

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### 3.6.4 PREPARATION FOR FRYING

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Most foods to be deep-fried, with the major exception of potatoes, are first given a protective coating of breading or batter. This coating serves four purposes:

1. It helps retain moisture and flavor in the product.
2. It protects the fat against the moisture and salt in the food, which speed deterioration of frying fat.
3. It protects the food from absorbing too much fat.
4. It gives crispness, flavor, and good appearance to the product.

#### **Breading**

Breading means coating a product with bread crumbs or other crumbs or meal before deep-frying, pan-frying, or sautéing. The most widely used method for applying these coatings is called the Standard Breading Procedure.

### The Three Stages of the Standard Breading Procedure

**1. Flour:** Helps the breading stick to the product.

**2. Egg wash:** A mixture of eggs and liquid, usually milk or water. More eggs give greater binding power but increase the cost. A small quantity of oil is occasionally added to the egg wash.

**3. Crumbs:** Combine with the egg wash to create a crisp, golden coating when fried. Fine, dry bread crumbs are most often used and give good results. Also popular are Japanese- style dry bread crumbs called panko (Japanese for “bread crumbs”). These coarser crumbs give a pleasing texture to fried items. Other products used are fresh bread crumbs, crushed corn flakes or other cereal, cracker meal, and cornmeal. For small items like scallops and oysters, breading may be done with the aid of a series of wire baskets placed in the flour, wash, and crumbs, instead of by hand. The procedure is the same except the baskets are used to lift and shake small quantities of the product and to transfer them to the next basket. To keep one hand dry during breading, use your right hand (if you are right-handed; if left-handed, reverse the procedure) only for handling the flour and crumbs. Use your other hand for handling the product when it is wet.

### Dredging with flour

The purpose of dredging is to give a thin, even coating of flour to a product. Meats to be sautéed or pan-fried are often dredged with flour to give them an even, brown color and to prevent sticking. Vegetables such as sticks of zucchini are sometimes coated only in flour before deep-frying to give them a light golden color and a very thin coating.

### Batters

Batters are semi-liquid mixtures containing flour or other starch. They are used in deep-frying to give a crisp, flavorful, golden brown coating. There are many formulas and variations for batters.

1. Many liquids are used, including milk, water, or beer.
2. Eggs may or may not be used.
3. Thicker batters make thicker coatings. Too thick a batter makes a heavy, unpalatable coating.
4. Leavenings are frequently used to give a lighter product. These may be:
  - Baking powder
  - Beaten egg whites
  - Carbonation from beer or seltzer used in the batter

Three recipes for basic, typical batters are given in the recipe for Deep-Fried Onion Rings. These batters may be used on a wide variety of products.

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### CHECK YOUR PROGRESS-I

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Q.1 What are the dry methods of cooking ?

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Q.2. What is the difference between deep fat frying and shallow frying ?

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Q.3 What is sous vide cooking?

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### 3.6.5 MEASURING INGREDIENTS

Correct measuring is another essential aspect of basic food preparation. The three major steps in measuring are:

1. Approximating the amount of required food (e.g., 4 ounces of cheese yields 1 cup shredded)
2. Selecting the right measuring utensil
3. Using an accurate measuring technique

#### Approximating the Amount of Required Food

The figure beside provides common food purchase quantities and their approximate yields. For example, one pound of all-purpose flour yields 4 cups (sifted), while one pound of granulated sugar provides 2–2 ¼ cups.

#### Selecting the Right Measuring Utensil

Whether an ingredient is liquid or dry determines the kind of measuring utensil that will be used, figure 7.1 describes these in detail. A graduated measuring cup with a lip for pouring is best for measuring liquid ingredients. Sets of flat-topped measuring cups are reserved for measuring dry ingredients. All dry ingredients are best measured by first stirring them to eliminate any packing or lumps. Amounts less than ¼ cup should be measured with measuring spoons. Sifting flour with dry ingredients such as baking soda or salt is an efficient way to blend and distribute the ingredients evenly. ( Fig 3B)

Knowing the general units used in measuring allows for the next step required for accuracy—using the largest this distinction and its implications; for example, 1 cup of powdered sugar does not weigh the same as 1 cup of honey. Also, a fluid ounce only measures volume, whereas an ounce measures weight. They are only equal when measuring water.

**Using Scales** For even better accuracy, different types of scales shown in (Fig. 3B) may be used to measure ingredients. Scales are used by commercial operations

UNIT CONVERSION	
<b>WEIGHT</b>	
1 ounce	= 28.35 gms
1 gm	= 0.035 ounce
1 pound	= 454 gms
1 Kilo gms	= 2.2 pounds
<b>VOLUME</b>	
1 Fl. Ounce	= 29.57 ml
1 ml	= 0.034 ounce
1 cup	= 237 ml
1 quart	= 946 ml
1 liter	= 33.8 Fl ounces
<b>TEMPERATURE</b>	
$C/5=(F-32)/9$	
OR	
$F=(9C/5)+32$	
Fig. 3B	

because they use weight to measure ingredients. Businesses cannot afford incorrect measurements that result in a loss of food, time, and money.

**Using an Accurate Measuring Technique:** Specific volume-measuring techniques for liquids, eggs, fat, sugar, and flour are discussed below.

**Liquids:** Only transparent graduated measuring cups with pouring lips should be used to measure liquids. The cup should sit on a flat surface and all measuring be done at eye level in order to accurately read the line at the bottom of the meniscus (the arc formed by the liquid's surface; the exception is milk, which is read at the top of the meniscus). Viscous liquids, such as honey, oil, syrup, and molasses, have a tendency to stick to the sides as they are poured, so the amount measured can be diminished by the amount that sticks to the sides. Should this happen, a rubber scraper can be used to remove the remaining contents.

Eggs range in size from pee wee to jumbo, but most standard recipes are based on large size eggs, if not specified. When half an egg or less is called for, it can be measured by beating a whole egg into a homogeneous liquid, which can then be divided in half or smaller increments. When measuring eggs, it is helpful to remember the following volume equivalents:

- 1 large egg = 2 ounces
- 4 large eggs = 7 ounces (just under 1 cup)
- 8 to 10 egg whites, or 12 to 14 yolks = 1 cup

**Fat and oil:** Different methods are used to measure liquid and solid fats. Liquid fats such as oil and melted butter are measured in glass measuring cups. Solid fats such as lard, shortening, butter, and margarine should be removed from the refrigerator and allowed to become plastic at room temperature. Once pliable and soft, they can be pressed into a fractional metal measuring cup with a rubber scraper. The fat should be pressed down firmly to remove any air bubbles and the top of the cup leveled with the straight edge of a spatula. As with liquids, amounts under  $\frac{1}{4}$  cups should be measured with measuring spoons.

**Sugar:** The amount of sugar needed depends on its type—granulated white sugar, brown sugar, or confectioners' sugar (powdered or icing). Measuring methods differ among these sugars, because 1 pound of each yields 2,  $2\frac{1}{4}$ , and  $4\frac{1}{2}$  (sifted) cups, respectively. White granulated sugar is usually poured into fractional measuring cups and leveled with a spatula. If it becomes lumpy, it can be mashed and sifted before measuring. Brown sugar has a tendency to pack down and become hard because it contains 2% moisture, which has a tendency to evaporate. Lumping can be prevented by placing the brown sugar in an airtight container and storing it in the refrigerator or freezer. Hardened brown sugar can be softened by placing it in a microwave oven for a few seconds, or in a conventional oven set at about 200°F (93°C) for a few minutes. Brown sugar is best measured by pressing it firmly into a fractional metal measuring cup and leveling it. The packing should be firm enough that the brown sugar retains the shape of the measuring cup when it is turned out. Lump-free or free-flowing brown sugar, which weighs 25% less than regular brown sugar, is measured in the same manner as granulated white sugar.

**Flour:** White flour is one of the more difficult ingredients to measure accurately by volume, because its tiny particles not only vary in shape and size, but also have a tendency to pack. Although there is no standard weight for a cup of flour, 1 pound of

all-purpose flour averages 4 cups. Professional bakers and chefs avoid the discrepancy in volume measurement by always weighing the flour. White flour should be sifted before being lightly spooned into a fractional measuring cup and leveled with a spatula. The cup should never be tapped or shaken down, because doing so can pack the flour particles tightly, which may result in too much flour being used. To avoid sifting and still get consistent baking results with regular white flour, one technique is to remove 2 tablespoons from each cup of un-sifted flour.

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### 3.6.6 MIXING TECHNIQUES

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Once the ingredients have been selected and measured, the next step is often to mix them all together.

- Mixing is a general term that includes stirring, beating, blending, binding, creaming, whipping, and folding. In mixing, two or more ingredients are evenly dispersed in one another until they become one product. In general, the other processes accomplish the same thing, but there are distinctions
- Stir- This method is the simplest, as it involves mixing all the ingredients together with a utensil (usually a spoon) using a circular motion.
- Beat-The ingredients are moved vigorously in a back-and-forth, up and down and round-and-around motion until they are smooth. An electric mixer is often used to beat ingredients together.
- Blend- Ingredients are mixed so thoroughly that they become one.
- Bind-Ingredients adhere to each other, as when breading is bound to fish.
- Cream- Fat and sugar are beaten together until they take on a light, airy texture.
- Whip or whisk- Air is incorporated into such foods as whipping cream and egg whites through very vigorous mixing, usually with an electric mixer or a whisk.
- Fold-One ingredient is gently incorporated into another by hand with a large spoon or spatula.
- There are many methods for combining the ingredients of cakes and other baked products, but the most commonly used are the conventional (creaming), conventional sponge, single stage (quick-mix), pastry-blend, biscuit, and muffin methods.

### Efficient Meal Preparation

Effective management of time can improve the efficiency of all the steps of meal preparation, which include:

1. Planning the menu
2. Developing a purchase list
3. Purchasing the food
4. Storing the food
5. Planning the order in which the menu items will be prepared
6. Preparing the food
7. Preparing the table
8. Serving
9. Cleaning up

The preparer can increase efficiency through menu planning and wise purchasing as described above, and through recipe consultation.

**Recipes:** There are four styles of recipe writing: the descriptive, standard, action, and narrative forms. The ingredients in the descriptive method are listed in the sequence in which they are used. This method displays the ingredient, amount, and directions in three columns, which makes it easy to read. The standard recipe style lists all ingredients and amounts with the instructions in numerical order. A modification of that form is the action recipe, which gives the instruction followed by the ingredients for that step only. Probably the most tedious to decipher is the narrative form, which reads like an essay, explaining ingredients, amounts, and preparation methods in text form. Food service establishments rely on standardized recipes that have been tested and adapted for serving a large number of people (48 to 500 servings). Standardized recipes, which frequently follow the descriptive style, record ingredients, proportions, and procedures, but the number of servings can easily be increased or decreased. When standardized recipes are stored in a computer, changing the number of servings automatically changes the amount of each ingredient needed. Standardized recipes are repeatedly tested and adapted to suit a particular food service operation.

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### 3.7 STOCKS (FOND)

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**Definition-** stock is a thin, clear, flavourful, nutritive liquid prepared by extracts from meat, poultry and fish and their bones and from vegetables and seasonings.

The objective in preparing stocks is to select the proper ingredients and then to extract the flavours. Stock is the foundation of many kitchen preparations including soups, sauces, stews and fish and rice dishes. The two main kinds of stock are white stock and brown stock, the name being determined by the type of bones used. A flavoured liquid base for making a sauce, stew, or braised dish. A white stock (fond blanc) is prepared by placing the ingredients directly into the cooking liquid, in a brown stock (fond brun) the ingredients are first brown in fat. Sauces made from white stock are always called white sauces, whether they are basic or variation sauces (e.g. allemande, poulette, aurora, supreme, etc). All sauces made from brown stock are called brown sauces (e.g. espagnole, bordelaise, bercy, piquant, etc). Stock can be used in thickened or unthickened form. They are based on veal, beef, poultry, game, vegetables, aromatic ingredients or fish. Other basic cooking stocks include veloute, consommé, essence, aspic, marinade, matignon, court bouillon and brine. White and brown stocks, which used to be essential bases for almost all the great classic sauces, take a long time to make and are often expensive. In practice they belong to the realm of the restaurant and their use has been considerably reduced in domestic cookery. The advent of the stock cubes –solid extracts which need only be dissolved in boiling water has reduced the use of traditional stocks. There are three main stocks:

1. **White stock** is made with white meat or poultry, veal bones, chicken carcasses, and aromatic vegetables. It is used to make white sauces, blanquettes, fricassees and poached chicken dishes.
2. **Brown stock** (formerly called jus brun in French) is made with mutton, beef, veal, poultry meat and bones and vegetables which have been browned in fat and then had the liquid added to them. It is used to make brown sauces and gravies, braised dishes, and brown stews, for deglazing fried meats and for making glazes by reduction.
3. **Vegetable stock** is made by boiling vegetables and aromatic herbs which have first been gently fried in butter.

In general stocks are aromatic but not salty since they have to remain unseasoned until the sauce is perfected. Nevertheless, an optional pinch of salt enhances the blending of the ingredients and the liquid. The meat used to make the stocks can be used afterwards to make minced (ground) dishes, purees, salpicon, stuffings etc. Stock is a flavoured liquid. It forms the basis of many dishes, particularly soups and sauces. Mutton, 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. The kind of bones used determines the kind of stock. Example:

1. **Chicken stock** – chicken bones
2. **White stock** – beef or veal bones or a combination of the two, chicken bones or even pork bones are sometimes added in small quantity
3. **Brown stock** –beef or veal bones browned in oven
4. **Fish stock** – fish bones and trimmings, bones from lean white fish give the best stock.
5. **Fumet** – the term fumet is often used for a flavourful fish stock especially one made with wine.

Proteins are dissolved when cooked with slow ,moist heat. When certain connective tissues (called collagen ) break down, they form gelatin which gives body to a stock. A well made stock thickens or even solidifies when chilled. Cartilage is the best source of gelatin in bones. Younger animals have more cartilage in their skeletons. Knuckle bones have a lot of cartilage apart from neck bones and shank bones.

**Mirepoix:** A mirepoix (meer-pwah in French pronunciation) is diced vegetable cooked for a long time on a gentle heat without colour or browning, usually with butter or other fat or oil. It is not sautéed or otherwise hard cooked, the intention being to sweeten rather than caramelize.

1. **Mirepoix**-onion, carrots and celery(leeks instead of onion if cost permits)
2. **Classical mirepoix** of decades ago – ham or bacon, leeks and other vegetables and one or more fresh herbs.
3. **White mirepoix** – without carrots –to keep stock colourless mushroom trimmings may be added to the white mirepoix.

**Size of mirepoix:** Size of mirepoix will depend on how long the mirepoix will cook. For beef stock cut the vegetables into large pieces (1 to 2 inches). Small pieces for fish stock - Onion 8oz (200g), Celery 4oz (100g), Carrot 4oz (100g).

**Acids:** Acids dissolve the connective tissue which leaves the bones. Tomato products contribute flavour and some acid to brown stocks. Tomatoes are not used for white stocks as they impart colour. Too much use of tomatoes in brown stock may make it cloudy. Wine is occasionally used especially for fish stocks. Flavour contribution of wine is more important than its acidity.

**Scraps and leftovers Seasonings, 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.

1. Salt not added when making

2. Herbs and spices should be used lightly, never dominate a stock
3. Herbs and spices are usually tied in a cheesecloth called a sachet (sa-shay french for bag)
4. Bouquet garni an assortment of fresh herbs and other aromatic ingredients tied in a bundle with string. The ingredients may be leek, celery, thyme sprigs, bayleaf and parsley stems. The ingredients can be changed to suit different recipes.

Ingredients commonly used for stocks

5. Thyme / bayleaf / parsley stems / whole cloves / peppercorns / garlic (optional)

Ingredients proportions for making stock= Mirepoix : Bones: Water = 1:5:10

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### 3.7.1 PRINCIPLES OF STOCK MAKING

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The textbook goes into more information about the principles of stock making but below are the procedures cooks should follow to develop the techniques and processes necessary to consistently make quality stocks consistently. By mastering stock making, cooks can produce quality sauces, soups, gravies and other products. It all begins with a stock that has the four main quality characteristics of:

- Body
- Clarity
- Flavour
- Colour

Procedure	Reason
<b>1. Start the stock in cold water</b>	Starting in cold water allows the proteins and other impurities to dissolve in the water and then as the liquid is heated the upward pressure of the steam causes these impurities to rise to the surface where they can be skimmed off. If the bones are covered in hot water the impurities (mostly oxygen carrying proteins) will coagulate more quickly and become dispersed in the liquid causing a cloudy stock Note: bones for brown stocks should be roasted to a nice deep brown prior to adding cold water.
<b>2. Bring the stock to a simmer</b>	Use high heat for this step but do not allow the stock to boil. High heat will create an upward pressure which in turns pushes the impurities (scum) upward and clarifies the stock.
<b>3. Simmer the stock gently</b>	Simmering allows the impurities (scum) to continue to rise to the top of the stock where it can be skimmed off and removed from the final product. If you allow the stock to boil the impurities can blend with the liquid – forming a cloudy stock.



<p><b>4. Skim the stock</b></p>	<p>Skimming is done to remove impurities from the liquid and improve the clarity of the final product. The stock must come to a simmer prior to starting the skimming process. Excessive skimming can actually bury the impurities back into the stock and have an adverse effect on the clarity</p>
<p><b>5. Add mirepoix and spices</b></p>	<p>The purpose of mirepoix is to flavour the stock and flavours break down when heated for a long time. While some chefs will add the mirepoix at the beginning of the cooking process it is best to add it two or three hours before the end of the cooking, If a stock is to be cooked for a short time, such as fish, the mirepoix is cut much smaller so it releases its flavour faster. Also, adding the mirepoix later, allows for proper skimming without removing flavouring ingredients. Mirepoix for brown stock should sautéed first and added with tomato products</p>
<p><b>6. Strain the stock carefully</b></p>	<p>Straining the liquid ensures your final stock will have better cleanliness or clarity. Strain through a china cap strainer lined with cheesecloth or use a very fine mesh strainer such as a chinois étamine.</p>
<p><b>7. Cool the stock quickly</b></p>	<p>Cool the stock quickly to prevent food-borne illnesses or souring. The goal is to get the stock out of the DANGER ZONE as quickly as possible.</p>
<p><b>8. Store the stock properly</b></p>	<p>Store the finished stock in a refrigerator (for up to 4 or 5 days) or in a freezer (for several months).</p>
<p><b>9. Degrease the stock</b></p>	<p>After the stock has cooled you can remove any hardened fat from the surface before reheating.</p>

### Types of Stocks

**1. Brown veal stock (fond brun de veau):** Bone 1.25 kg shoulder of veal and the same amount of knuckle of veal. Tie them together with string and brush with melted dripping. Crush 500g veal bones as finely as possible. Brown all these ingredients in a large flameproof casserole or saucepan. Peel and slice 150g carrots and 100g onions, then add them to the pan. Cover and leave to sweat for 15 mins, add ½ liter water and reduce to a jelly, repeat the process, add 3 liters water or white stock and bring to the boil. Skim and season. Leave to simmer very gently for 6 hrs. Skim off the fat and strain through a fine sieve.

**2. Brown beef stock (fonds brun or estouffade)**

**For 10 liters**

3.5kg beef bones chopped into small pieces, fat removed  
 250g carrot  
 250g onion  
 150g leek  
 250 g celery  
 10 liters of water  
 100 g mushroom trimmings

1 sprig thyme  
2 bay leaf  
Parsley stalks  
10 peppercorns.

1. Brown the bones in fat in the oven then strain off all the fat.
2. Brown the vegetables in the same fat in a frying pan on top of the stove or in the oven then strain
3. Place the bones and vegetables in a stockpot, cover with the cold water and bring slowly to the boil
4. Remove any scum that rises to the surface
5. Add the bouquet garni and peppercorns
6. Simmer gently for 3-4 hours, continuously removing all traces of scum and grease.
7. Strain through a conical strainer into a clean saucepan reboil and use as required or cool as rapidly as possible and place in a refrigerator at 7°C until required.

### 3. Game stock (fond de gibier )

Tie together 1.5 kg shoulder, breast and other pieces of venison, draw and truss 1 old partridge and 1 old pheasant, brush all the meat with butter and brown in the oven in a roasting tin. Slice 150g carrots and 150g onions. Line a large flameproof casserole with fresh pork rind, then add the carrots and onions, 1kg hare or white rabbit trimmings, and the rest of the game. Deglaze the roasting tin with ½ liter red wine and ½ liter water and bring to the boil then skim and season lightly. Add a large bouquet garni a sprig of sage, 10 juniper berries and 1 clove. Simmer for 3 hours, skim off the fat then strain through a fine sieve.

### 4. Light brown stock (fond brun clair)

Scald 150g fresh pork rind and 125g knuckle of ham and saute for 4-5 minutes. Bone 1.25 kg lean stewing beef (leg or blade) and Cut into cubes, together with the same amount of knuckle of veal. Peel 150g carrots and 150g onions cut into slices then brown on top of the stove in a large flameproof casserole with all the meat 500g crushed veal or beef bones and the pork rind. Add a bouquet garni, 1 clove of garlic ½ liter water and reduce to a jelly consistency. Add ½ liter water and reduce to a jelly again. Add 3 liters water and 15gm coarse salt bring to the boil and simmer very gently for 8 hours. Skim off the fat and strain through a fine sieve.

### 5. Thick veal stock (fond de veau lie)

Reduce 2 liters brown veal stock to three quarters of its volume. Thicken with 15g arrowroot blended with 3 tablespoons clear cold veal stocks. Strain through muslin.

### 6. Tomato veal stock (fond de veau tomate)

Add 2 liter tomato puree to 2 liters brown veal stock. Reduce to three quarters of its volume. Strain through a fine sieve.

### 7. White stock (fond blanc ordinaire)

Bone a 750g shoulder of veal and 1 kg knuckle of veal then tie them together with string. Crush the bones. Place the bones meat and 1 kg chicken giblets or carcasses in a saucepan, add 3.5 liters water, bring to the boil and skim. Add 125g sliced carrots,

100g onions, 75g celery and a bouquet garni. Season simmer gently for 3½ hours. Skim off the fat and put through a very fine strainer.

**8. White chicken stock (fond blanc de volaille)**

For 10 liters

3.5 kg chicken bones  
10 liters water  
250g carrot  
250g onion  
150g leek  
250g celery  
100g mushroom trimmings  
1 sprig thyme 2 bayleaf Parsley stalks

1. Place the bones in a stockpot, cover with cold water, and bring slowly to the boil.
2. Remove any scum that rises to the surface
3. Add the vegetables, herbs and peppercorns
4. Simmer gently for 2 hours, continuously removing all traces of scum and grease
5. Pass through a conical strainer into a clean saucepan, re-boil and use as required or cool as rapidly as possible and place in a refrigerator at 7°C until required.

**9. Lamb or mutton stock (fonds de mouton)**

Proceed in the same way as for white chicken stock using lamb or mutton bones and cook for 1 hr only.

**10. Veal stock (fonds de veau)**

Proceed in the same way as for white chicken stock using veal bones and cook for 2 hrs.

**11. Fish stock (fumet de poisson)**

For 5 liter

50g butter  
2 kg white fish bones  
200g sliced onions  
1 juice of lemon  
1 bay leaf  
A few parsley stalks  
5 peppercorns  
5 liters water

- Melt the butter in a saucepan
- Add the washed fish bones sliced onion lemon juice and herbs
- Cover with greaseproof paper and a lid and sweat for 5 mins without colouration in order to extract the juices from the bones.
- Cover with cold water, bring to the boil and skim any impurities that rise to the surface then simmer for 20 mins
- Strain into a clean pan, re-boil and use as required.

**12. Remouillage:** It is prepared by simmering bones and mirepoix for a second time, the word translated from French as a “rewetting”. Made from the clarification raft used to prepare consomme’, this secondary stock can be used as the liquid for stocks, broths, as a cooking medium, or reduced to a glace.

**13. Glaze -French glaze (glahss):** Glace – is a highly reduced stock or remouillage. The result of continuous reduction , the stock acquires a jelly like or syrupy consistency and its flavor becomes highly concentrated. When chilled, a glace takes on a rubbery consistency. Glazes diluted to original strength do not taste like the stocks they were made from.

**Kinds of glazes:** Meat glaze or glace de viande (glahss duh vee awnd) Chicken glaze or glace de volaille (voh lye) - made from chicken stock Fish glaze or glace de poisson (pwah sohn ) - made from fish stock.

#### 14. Fumets:

It is sometimes called essences are concentrated, highly aromatic stock.

Fish Fumet – is prepared by sweating fish bones along with vegetables such as leeks, mushrooms, and celery, then simmering these ingredients in water often with some dry white wine.

Fish Stock – uses bones from lean flatfish like sole and turbot. Sometimes used to make very clear broth or consomme’.

#### 15. Court Bouillon

Or short broth, is often prepared as the cooking liquid for fish by simmering aromatic vegetables in water with an acid such as wine or vinegar. When fish bones or shells are simmered in the court bouillon, it is called a Nage.

#### 16. Vegetable stock

For 5 liters

250g carrot

250g onion

150g leek

250g celery

100g mushroom trimmings

50ml oil

5 liters water

400g squashed tomatoes

1 sprig thyme

1 bay leaf

Parsley stalks

10 peppercorns

1. Sweat the vegetables in the oil in a stockpot
2. Add the water and bring gently to the boil then add the mushrooms tomatoes herbs and peppercorns
3. Simmer gently for 45 minutes, continuously removing any scum and fat
4. Strain through a conical strainer into a clean saucepan, re-boil and use as required or cool as rapidly as possible and place in refrigerator at 70C until required.

**Note:**

- Vegetables, herbs and spices, water and sometimes wine are to be used.
- If you want a particular flavour to predominate use a larger quantity of that vegetable.
- For a neutral all purpose vegetable stock avoid strong flavoured vegetables.
- Starchy vegetables such as potatoes, sweet potatoes and winter squash make the stock cloudy. Use if clarity is not important.
- Some vegetables are to be avoided. Brussels sprouts, cauliflower can overwhelm a stock with a strong flavour or odour. Dark green leafy vegetables especially spinach develop an unpleasant flavour when cooked for a long time. Beetroot turns a stock red.
- Sweating the vegetables in a small amount of oil before adding water gives them a mellow flavour.

Other points one should know

- Today, ready-made stock and stock cubes consisting of dried, compressed stock ingredients are readily available, although of inferior quality to that of a properly prepared home-made stock. These are commonly known as bouillon cubes (or oxo cubes, after a common brand of stock cube sold in Britain).
- Broth is very similar to stock, and often the terms are used interchangeably. Usually, broth refers to finished product while stock is used as an ingredient (thus stock may become broth). Other times, broth is used to refer to a liquid made in the same way as stock but meat is substituted for bones. However, with some stock/broth made from vegetables and some made from both bones and meat, this cannot be considered a hard-and-fast rule. Fond Brun, or brown stock, is the most common type used. The brown color is achieved by roasting the bones and mirepoix. This also adds a rich, full flavor. Veal bones are the most common type used in a fond brun. Fond Blanc, or white stock, is made by using raw bones and white mirepoix. Chicken bones are the most common for fond blanc. 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 flavor. Concentrated fish stock is called "fish fumet".
- Court Bouillon is not a stock or broth in itself but aromatic cooking liquid used exclusively for blanching or poaching delicate meats, fish, offal such as brains and vegetables. It rarely features in the finished dish. For flavour, court bouillon must contain a substantial amount of lemon, wine or vinegar and seasoning. The French word 'court' meaning short denoting the relatively short cooking time needed to prepare court bouillon before adding the ingredient to be poached".
- Chicken stock should be cooked for 4–5 hours. Veal stock should be cooked anywhere from 8 hours to overnight.
- 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 flavor desired.
- Ham stock, common in Cajun cooking, is made from ham hocks.
- Prawn stock is made from boiling prawn shells. It is used in Southeast Asian dishes such as Laksa.
- Vegetable stock is made only of vegetables. It is common today, but is not a traditional type of stock.
- Meat is added to a stock before vegetables, and the "scum" that rises to the surface is skimmed off before further ingredients are added. Veal, beef and chicken, with bones, if possible, are most commonly used. Fish, venison and other kinds of

poultry are also used for certain types of stock. Other types of meat, such as mutton, are generally considered less suitable because of their strong taste. The meat need not be of prime quality. In fact, gristle and skin and other parts that are not generally eaten may be used, since all meat and vegetables are removed when the stock is finished. In some countries, older chickens are sold as "boiling hens" or "stewing hens", and fish stock is often prepared from the heads of fish. Vegetable stock is made only of vegetables. It is common today, but is not a traditional type of stock

### 17. Consommé

Consommé is the most sophisticated of all stock-based soups. It is made by reducing veal, beef, and chicken or, less frequently, game or fish stock and then clarifying it to produce a concentrated, flavourful sparkling liquid. Its transparency is deceptive since good consommé has punch, a heady aroma and strong flavour that is neither bland, salty, thin neither heavy.

The clarification process is simple. Well-flavoured fat-free stock is brought slowly to a boil with egg whites whisked in along with finely chopped root vegetables and aromats. As the egg whites cook, they rise to the top of the stock in a froth that coagulates to form a raft. The consommé is left to simmer for about an hour so that all the impurities coagulate leaving the liquid clean and sparkling.

Madeira or sherry can be added just before serving or during clarification. Consommé should have a clear tint. Meat consommé should be darker than that of chicken or fish. The gelatin content of consommé gives it a smooth texture when hot and sets it to a jelly when it is chilled.

Consommé garnish is added just before serving so that it does not cloud the soup. A tablespoon of garnish is sufficient. No ingredients should be larger than the size of a pea, although a few classic consommés call for whole poached eggs or quenelles with chopped herbs, pasta and cooked custards, which make good garnishes. Derivatives of consommé get classified according to the garnish, which is added to the consommé.

**How clarification works:** Coagulation of proteins was an important subject in our discussion on stock making, because one of our major concerns was how to keep coagulated proteins from making the stock cloudy. Strangely enough, it is this same process of coagulation that enables us to clarify stock to perfect transparency. Remember some proteins especially that called albumin, will dissolve in cold water. When the water is heated, they gradually solidify or coagulate and rise to the surface. If we control this process very carefully, these proteins will collect all the tiny particles that cloud a stock and will carry them to the surface. The stock is then left perfectly clear. If, on the other hand, we are not careful, these proteins will break up as they coagulate and will cloud the liquid even more, just as they can do when we make stock.

#### Basic ingredients:

The mixture that we use to clarify the stock is called the clear meat or the clarification.

1. Lean minced meat is the major source of protein that enables the clearmeat to do its job. It also contributes towards the flavor of the consommé. It must be lean because fat is undesirable in a consommé as it will float on the surface after

straining and give a greasy appearance to the soup. Beef shin and shank is the best cut to use as it is rich in albumin proteins as well as in flavor and gelatin, and it is very lean. Chicken meat should be used to clarify chicken stock and beef used for a beef consommé. Obviously, meat would not be used to clarify a fish stock! Although, ground fish meat could be used to clarify fish stock, often it is omitted altogether and only egg whites used in its place.

2. Egg whites are included in the clear meat, because being mainly albumin; they greatly strengthen the clarifying power.
3. Mirepoix and other seasoning and flavoring ingredients are usually included because they add flavor to the finished consommé. They do not actually help in the clarification process except possibly to give solidity to the raft. The raft is the coagulated clearmeat floating in a solid mass on top of the consommé. The mirepoix must be cut into small pieces as it must float with the raft as well as the maximum exposed surface area will aid extraction of flavor and nutritive value. A larger amount of a particular vegetable may be added if a distinct flavor is called for, for example, celery flavored consommé.
4. Acidic ingredients like vinegar and tomato for beef and chicken consommé and lemon juice and white wine for fish consommé are added because the acidity helps with the coagulation process.
5. Seasoning and flavorings like salt, peppercorns and bay leaf are usually added.

Procedure for preparing basic Consommé:

Stock plain	1 liter
Lean meat (suitable)	100 gm
Onion	30 gm
Carrot	30 gm
Celery	20 gm
Egg white	1-2 (shell optional)
Vinegar/lemon juice/	15 ml
Wine (red or white)or Tomato	20 gms
Pepper corn	4-6 nos.
Bay leaf	1 no
Salt	a pinch

1. Start with a well flavored and cooled down stock. If the stock is weak, reduce it to concentrate, and then allow to cool and then begin the process. Else, simmer the consommé longer than the recommended time.
2. Select a heavy stockpot.
3. Combine the clear meat ingredients in the stockpot and mix vigorously. Mix in a small amount of water. This allows the proteins, which do the clarifying to dissolve out of the meat. Some chefs will disagree on the importance of this step and will omit it altogether (the addition of the water, that is).
4. Gradually add the cool, degreased stock and mix well with the clear meat. The stock needs to be cool so that it does not cook the proteins on contact. Mixing the clear meat will distribute the proteins throughout the stock so that they can collect all the impurities more easily.
5. Set the pot over a full fire and allow it to heat, stirring gently. This prevents the proteins of the egg white from settling at the bottom and burning. Let it come to a boil.

6. As the stock heats up stop the stirring. As the stock comes to a boil, the clear meat will rise to the surface as the raft and float on the top.
7. Reduce the fire to as low as possible so that the liquid maintains a slow simmer. Do not cover the vessel. Boiling would break up the raft and cloud the consommé. The same principle was used in stock making, remember?!
8. Simmer without disturbing the raft, for about half an hour to 45 minutes.
9. Strain the consommé carefully through a wet muslin cloth. Do not force the liquid through or press the raft. Or fine particles will seep through and cloud the consommé.
10. Degrease to remove all traces of fat from the surface. Use strips of brown paper to absorb traces of fat.
11. Adjust the seasoning.

### Emergency procedures:

1. Clarifying hot stock: if you do not have the time to cool the stock properly, at least cool it as much as you can. A cold water bath for even 10 minutes will be helpful. Then mix crushed ice cubes with the clear meat before adding the stock. This will help to prevent the meat from coagulating when the stock hits it.
2. Clarifying without meat: In a pinch, you could clarify stock using egg whites alone. Use extra egg whites and a little mirepoix if possible. Make sure that the stock in this case is a good and concentrated one. Care must be taken in this case as the raft is a very fragile one and may tend to break easily. Egg white and mirepoix are often used alone to clarify fish stock.
3. Failed clarification: If the clarification process has failed because you allowed it to boil too long or for any other reason, it can still be rescued. Strain the consommé and allow it to cool as much as you can. Now slowly add it to a mixture of ice cubes and egg white. Carefully return the pan to a simmer and proceed with the clarification. However, the ice cubes will dilute the stock and this procedure must be used in emergencies only.
4. Poor color: Beef or Veal consommés made from a brown stock must be amber in color and not dark brown. Chicken consommé will be pale amber. To improve the color, add a drop of caramel after straining, or a cut and browned (on a griddle) slice of onion, before the clarification.

### Consommé derivatives

<b>Consommé Alexandra</b>	Chicken consommé, shredded lettuce, chicken quenelles and shredded chicken meat
<b>Consommé Andalusian</b>	Chicken consommé, cubes of tomato royal, rice, strips of ham and pancake mixture poured into the broth through a sieve
<b>Consommé Brunoise</b>	Beef consommé, brunoise of vegetables
<b>Consommé Breton</b>	Beef consommé, strips of leeks, knob celery, mushrooms and shredded chervil
<b>Consommé Cardinal</b>	Seafood consommé flavoured with lobster, lobster quenelle
<b>Consommé Julienne</b>	Beef consommé, juliennes of vegetables
<b>Consommé St. Germain</b>	Beef consommé, quenelles, peas, shredded lettuce and chervil
<b>Consommé Princess</b>	Beef consommé, asparagus tips



<b>Consommé Royal</b>	Chicken consommé, cubes of flavoured, unsweetened egg custard
<b>Consommé Celestine</b>	Beef consommé, thin strips of unsweetened pancake
<b>Jellied Consommé</b>	A well-reduced beef consommé served cold, which should melt on the tongue

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### 3.8 SAUCE

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Sauces are the next most important part of the French & continental cuisine. These sauces can be derived from stocks by using different thickening agents. Sauces are capable of adding variety to the dishes by imparting color, flavor, texture and even drama to a great extent. Sauces are of different types. They vary by way of the basic ingredient used, color and consistency. These sauces are integral for plate presentations and add to the overall improvement of the product. A sauce is liquid, creamy or semi-solid food served on or used in preparing other foods. Sauces are not normally consumed alone; they add flavor, moisture, and visual appeal to the final dish. Sauce is a French word taken from the Latin *salsus*, meaning salted. Possibly the oldest sauce recorded is *garum*, the fish sauce used by the Ancient Romans.

Sauces may be used for savory dishes or for desserts. They can be prepared and served cold, like mayonnaise, prepared cold but served lukewarm like pesto, or can be cooked like béchamel and served warm or again cooked and served cold like apple sauce. Some sauces are industrial inventions like Worcestershire sauce, HP sauce, or nowadays mostly bought ready-made like soy sauce or ketchup, other are still freshly prepared by the cook. Sauces for salads are called salad dressing. Sauces made by deglazing a pan are called pan sauces.

*Definition:* A sauce is a liquid or a semi-liquid mixture used as an accompaniment or a part of various preparations of meat, vegetables, fish or fruit to enhance the taste and prevent dryness of the dish.

OR

A sauce may be defined as a liquid or a semi-liquid flavorful liquid usually thickened, used to season, flavor and enhance aroma to another foods.

#### Importance of Sauces in Food Preparation

- Enhances flavor.
- Some sauces help in digestion, e.g. mint sauce, apple sauce with roast pork.
- It gives moistness to the food, e.g. white sauce adds creaminess to firm and dry food.
- Adds colour to the food. Hollandaise sauce served on a vegetable adds colour. Tomato sauce goes with Fish a l'orly.
- Served as an accompaniment, sometimes gives a contrast taste to another food, e.g. cranberry sauce with roast turkey.
- Sometimes gives the name to the dish. E.g. Madeira wine when added to brown sauce it is called Sauce Madeira.
- Enhances nutritional value of the dish.
- Dress and complements food that need some additional quality and makes the food more palatable.
- Gives tartness and contrast or balances a bland food.

**Thickening Agents**

These are different ingredients added to give the thick consistency to a sauce. The different agents make each sauce unique by way of its taste, color, consistency & flavor.

**Roux:** It is a fat and flour mixture, which are cooked together. It is cooked to various degrees, namely white, blond or brown. Equal quantities of flour and butter and margarine are taken to prepare the different colored roux. The colour acquired depends upon the degree of cooking of the flour and the colour of the sauce depends upon the liquid and roux used. While preparing the sauce, boiling liquid should never be added to a hot roux as it may become lumpy, a cold liquid to a hot roux or hot liquid to an old roux may be added to get smooth texture.

**Starch:** Arrowroot, corn flour, fecule (potato starch), tapioca are used to thicken the sauce. A paste should be made of cold liquid and starch and then stirred into boiling liquid and allowed to boil, till the starch is cooked. It gelatinizes at 93°C. Starch contains no gluten and gives a clear sauce and thickens more as it cools.

**Beurre Maigne:** It is chiefly used for fish sauces. Equal quantities of flour and butter are kneaded, and very little quantity is added at a time to the boiling liquid and stirred well to form a smooth consistency.

**Yolks of Eggs and Cream:** It is a liaison, added as a finishing agent at the end of cooking. The product is never boiled, when the liaison is added, or it would curdle. The liaison is added to thicken delicate cream or veloute sauces or cream soups. Yolks of eggs are used to prepare mayonnaise by emulsifying with oil.

**Blood:** It is usually used for game cooking. It thickens the sauce and gives a particular flavor e.g. preparation of Jugged Hare.

**Standards for quality sauces**

**1. Consistency & Body:**

Most sauces should be smooth with no lumps. They should not be too thick and pasty. They must be thick enough to coat the foods lightly.

**2. Flavor:**

The flavor of the sauce should be distinctive and well balanced. There must be a proper degree of seasoning with no starchy taste. The flavor should be selected to enhance or complement the food.

**3. Appearance:**

The appearance should be smooth with a good shine and gloss. It should have the requisite color: rich brown for the espagnole, pale ivory for the veloute and white (not gray) for the béchamel.

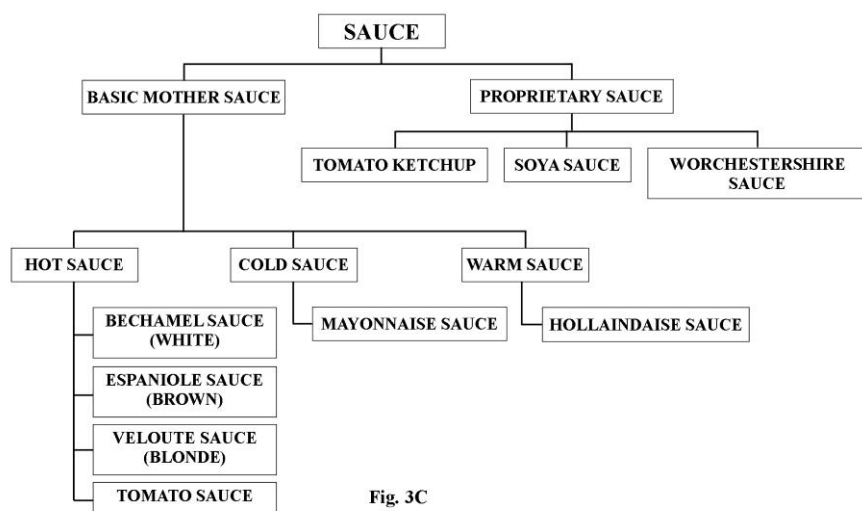


Fig. 3C

**Classification of Sauces ((Fig.3C)**

Sauces could be grouped as follows:

- Basic sauces
- Cold Basic Sauces
- Butter Sauces
- Others sauces (miscellaneous)

**BASIC MOTHER SAUCES****1. Bechamel**

Thickening milk with a white roux and simmering it with aromatics makes this white sauce. It should be creamy, smooth and lustrous.

**2. Espagnole or Brown Sauce**

This is made by sweating the mirepoix and adding the tomato puree till lightly caramelized. The brown roux is added to this and the brown veal stock is thoroughly incorporated into it. It should be simmered and skimmed throughout cooking. Then it should be strained and kept for later use.

**Demi - Glace**

This is a highly flavored glossy sauce. It literally translates, as “half glace”, a demi glace of excellent quality will have several characteristics. It should have a full, rich flavor. The aromatics should not be overpowering; it should have a deep brown color, be translucent and glossy when correctly reduced. It should be of nappe consistency.

**3. Veloute**

Thickening a white stock with an appropriate amount of pale roux, then stirring it until it is completely cooked out makes this ivory colored, lustrous sauce. It should be smooth and thick enough to nappe.

**4. Tomato Sauce**

There are several approaches for making a tomato sauce. It should have a deep, rich, tomato flavor, with no trace of acidity and bitterness. There should be only hints of supporting flavors from stocks, aromatics and pork fats, when used. This sauce is coarser than any other of the grand sauces because of the degree of texture that remains even after cooking and at times pureeing the tomatoes.

**5. Mayonnaise**

A simple mayonnaise is the foundation for a number of sauces. Mayonnaise is very easy to make if one follows a few rules. First, have all the ingredients at room temperature before begin. Add the oil very slowly, drop by drop, at the beginning until the sauce begins to emulsify; then add the remainder in a steady stream without risk of breaking the mayonnaise. If the sauce does separate, whisk in teaspoon mustard in a warm, dry bowl until creamy (mustard helps to emulsify the sauce). Then gradually whisk in the remaining mayonnaise.

**Rectification of curdled mayonnaise**

If the mayonnaise is curdled then pour few drops of lukewarm water and continue or take fresh egg yolk and continue further.

**6. Hollandaise**

This is an emulsion sauce where melted and clarified butter is suspended in partially cooked egg yolks. It is fragile because it is not a true mixture. It should not be held directly near heat, or else it will break. The sauces flavor when correctly made will be buttery. The egg yolks and reduction ingredients (vinegar and peppercorns) give the sauce a balanced taste. It should be pale lemon in color. Hollandaise and its variations are opaque, but the sauce should have a luster and not appear oily. They should have a smooth texture. A grainy texture indicates over cooking of the egg yolks. It should have light consistency and at times almost appears frothy. Some problems occur during the process

- **Curdled appearance** – if the sauce develops this, it may mean the addition of butter is too rapid for the egg yolks to absorb it. It should be whipped till it appears smooth and then proceed.
- **Scrambling of egg yolks** – this happens if the sauce gets overheated. It should immediately be removed from the heat and allowed to cool. If it doesn't correct, you may need to start afresh.

### Sauces at a glance

SAUCE	TYP E	ROUX	COLOR	STOCK USED	WHERE USED
Béchamel or White sauce	Hot	White roux cooked to sandy texture Ratio of flour, butter and stock 1:1:10	White or off-white	Milk	Augratin dishes
Veloute	Hot	Roux cooked to sandy texture and off white in color Ratio of flour, butter and stock 1:1:10	Off-white or pale yellow	Fish or meat or vegetabl e stock and the name is given accordin g to the type of stock used	Chicken Veloute. Fish Aurore etc.
Espagnole or Brown sauce	Hot	Roux cooked to sandy texture and dark brown in color Ratio of flour, butter and stock 1:1:10	Dark brown	Brown stock	Chicken Ragout
Tomato	Hot	Roux may or may-not be used in thickening	Red	Water	Spaghetti Napolitane
Hollandaise	Hot	Eggyolk and butter is cooked on bainmarie and then clarified butter is added	Light yellow		Steak grille béarnaise

Mayonnaise	Cold	Oil and Egg yolk is emulsified together	Light yellow		Sandwiches Oeuf mayonnaise
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**Tips for Making a Good Sauce:** Constantly stir roux-thickened sauces when cooking to prevent lumps.

- If a roux-thickened sauce develops a few lumps, beat them out with a rotary beater or wire whisk or strain sauce with a sieve to remove lumps.
- Cook egg-thickened sauces over low heat, or cook these sauces in the top of a double boiler over hot, not boiling, water. Always temper (warm) the egg yolks before adding them to the sauce by first stirring in a little of the hot sauce mixture into them. Then add to the remainder of the sauce mixture. Never let a sauce boil after the egg yolks are added as the sauce may curdle.
- Ensure that the water doesn't touch the bottom of the pan holding the sauce.

**Sauces used in Different Cuisines:** Sauces used in traditional Japanese cuisine are usually based on *shōyu* (soy sauce)

- *Miso* or *dashi*. *Ponzu*, citrus-flavored soy sauce, and *yakitori no tare*, sweetened rich soy sauce, are examples of shoyu-based sauces.
- Miso-based sauces include *gomamiso*, miso with ground sesame, and *amamiso*, sweetened miso.
- In modern Japanese cuisine, the word “sauce” often refers to Worcestershire sauce, introduced in the 19<sup>th</sup> century and modified to suit Japanese tastes.
- Tonkatsu, okonomiyaki, and yakisoba sauces are based on this sauce. Japanese horseradish or wasabi sauce is used on sushi and sashimi or mixed with soy sauce to make wasabi-joyu.
- Some sauces in Chinese cuisine are soy sauce, doubanjiang, hoisin sauce, sweet bean sauce, chili sauces, oyster sauce, and sweet and sour sauce.
- Korean cuisine uses sauces such as doenjang, gochujang, samjang, and soy sauce.
- Southeast Asian cuisines, such as Thai and Vietnamese cuisine, often use fish sauce, made from fermented fish.
- Indian cuisine uses sauces such as tomato-based curry sauces, tamarind sauce, coconut milk/paste based sauces, and chutneys.
- Salsas (“sauces” in Spanish) such as pico de gallo (salsa tricolor), salsa cocida, salsa verde, and salsa roja are a crucial part of many Latino cuisines in the Americas and Europe.
- Typical ingredients include tomato, onion, and spices; thicker sauces often contain avocado.
- Mexican cuisine uses a sauce based on chocolate and chillies known as mole. Argentine cooking uses more Italian-derived sauces, such as tomato sauce, cream sauce, or pink sauce (the two mixed).
- Peruvian cuisine uses sauces based mostly in different varieties of ají combined with several ingredients most notably salsa huancaína based on fresh cheese and salsa de ocopa based on peanuts or nuts. It is said that each household in the country has its own secret salsa recipe.

### Sauce derivatives

## 1. Bechamel Or White Sauce:

- Mornay - B + Cheese
- Cream - B + Heavy cream
- Cheddar - B + Cheddar cheese

## 2. Mayonnaise: {Cold Basic Sauce}

- Tartare - M + Chives + Parsley + Capers + Shallots + Gherkins
- Cocktail - M + Tobasco sauce + Worcestershire sauce + Tomato puree
- Remoulade - M + French mustard + Anchovy essence
- Chantilly - M + Whipped cream
- Andalouse - M + Tomato puree + Pimento

## 3. Hollandaise: {Hot Sauce-Cannot Be Stored}

- Bearnaise - H + Shallots + Terragon
- Mousseline - H + Whipped cream
- Charon - H + Shallots + Mint
- Maltaise - H + Orange juice + Grated orange zest
- Paloise - H + Shallots + Mint

## 4. Tomato:

- Barbeque - T + Onions + Garlic + Sugar + Vinegar + Chili powder + Worcestershire sauce
- Creole - T + Onions + Garlic + Celery + Green pepper
- Milanaise - T + Ham + Mushrooms

## 5. Veloute:

- Supreme - CV + Cream
- Allemande - CV + Egg yolk + Cream
- Normandy - FV + Egg yolk + Cream
- Mushroom - CV + Egg yolk + Mushroom
- Aurore - CV + Tomato puree

## 6. Espagnole:

- Chasseur - E + Mushroom + Shallots + Tomato concasse + Parsley
- Bordelaise - E + Shallots + Bone marrow + Lemon + Meat glaze + Bordeaux wine
- Bercy - E + Shallots + White wine + Meat glaze + Parsley
- Estragon - E + Terragon
- Perigourdine - E + Foiegrass puree + Sliced truffles
- Zingara - E + Tomatoes + Mushrooms + Truffles + Ham + Tongue + Cayenne + Madiera wine

## 7. Dessert Sauces:

These accompany puddings and desserts; giving flavour, taste and color contrast.

- Orange sauce - Crepe suzette
- Chocolate sauce - Ice cream
- Jam sauce - Bread pudding
- Melba sauce - Pudding

- Rum sauce - Ice-cream

#### 8. Other Sauces:

- Demiglaze – (demi-glace in French) – is defined as half brown sauce and half brown stock, reduced to half.
  - *Jus de veau lie* - DG + Mirpoix + Tomato puree
  - *Madere* - DG + Madeira wine
  - *Mushroom* - DG + Mushrooms + Shallots + White wine
  - *Bigarde* - DG + Wt. wine + Cider vinegar + Orange juice + Current jelly
  - *Robert* - DG + White wine + Peppercorn + Butter
  - *Provencal* - DG + Anchovy fillet + Wt. wine + Tomato sauce

#### 8. Butter Sauce-

- Melted butter- this is the simplest butter preparation of all unsalted or sweet butter has the freshest taste and is ideal for all sauce making.
- Clarified butter- Butter consists of butterfat, water, and milk solids. Clarified butter is purified butter, with water and milk solids removed. If using for sautéing, unclarified butter would burn at such high temperature because the milk solids will get burnt at such high temperature.
- Brown butter (Beurre Noisette) – Melted butter has been heated until it becomes light brown and gives off a nutty aroma, usually prepared at the last minute and served over fish, white meats, eggs and vegetables.
- Black butter – (Beurre Nois) – Butter heated until it is a little darker and flavored with few drops of vinegar, capers, chopped parsley or both are sometimes added.
- Meuniere butter – Brown butter is seasoned with lemon juice and poured over the fish, which has been sprinkled with chopped parsley.
- Compound butter – made by softening raw butter and mixing it with various flavoring agents. The moisture is then rolled into a cylinder in waxed paper. Compound butter have two main uses: -
  - Slices of compound butter are placed on a grilled items at service time, the butter melts over the item.
  - Small portions are swirled into to finish them and give them a desired flavor.

E.g. Beurre Maitre d' hotel-  
 Butter-500 ml + chopped parsley-60 gm + lemon juice-50 ml + White pepper powder  
 Other examples are- Anchovy butter, Garlic butter, Snail butter, Shrimp butter, Mustard butter, Herb butter etc.
- Beurre blanc – Sauces made by whipping raw white butter into a small quantity of flavorful reduction of white wine and vinegar, so that the butter melts and forms an emulsion with the reduction.

#### 10. Proprietary sauces-

These are the sauces which are sold in brand names and are of use in specific food preparation.

- Tabasco
- Capsico
- HB sause
- 8n8 sauce
- Wochestershire sauce
- Tomato ketchup
- Soya sause
- Chilli sauce

All the major sauces are made of three kinds of ingredients:

- A liquid, the body of the sauce
- A thickening agent
- Additional seasoning and flavoring ingredients

**A liquid:** Liquid ingredients provide the body or the base of most sauces. There are five liquids on which most sauces are built, and the resulting sauces are called Leading sauces/ Mother sauces/ Basic sauces.

White Stock (chicken, veal or fish) – for Veloute sauce

Brown Stock – for Brown sauce or Espagnole sauce

Milk – for White or Béchamel sauce

Tomato stock – for Tomato sauce

Clarified butter- for Hollandaise sauce

**A thickening agent:** A sauce must be thick enough to cling tightly to the food, and for the purpose we use certain thickening agents. The most common thickening agent is flour. There are other starches which can also be used as thickening agent like corn starch, bread crumbs, potato starch, rice flour, beurre manie, blood, egg yolk, tapioca etc.

### Starches

- **Beurre manie** – It is a mixture of equal parts of soft, raw butter and flour worked together to form a smooth paste. Used for quick thickening at the end of cooking to finish the sauce. The raw butter adds to flavor and gives a sheer to the sauce when it melts. When Beurre manie is used, it should always be added in small quantities and then stirred till desire consistency is reached.
- **White wash** – A thin mixture of flour and cold water. Sauces made with white wash have neither good flavor nor a fine texture as those made with roux.
- **Cornstarch** – Produces a sauce that is almost clear with a glossy texture. To use, mix with cold water or other cold liquid until smooth. Stir in to hot liquid, bring to boil and simmer until the liquid turns clear and there is no starchy taste. Do not boil for a long time or the starch may break down and the liquid will thin out. Cornstarch has roughly twice the thickening power of flour.
- **Arrowroot** – Used like cornstarch, but it gives a clearer sauce.
- **Instant starch** – Readymade, pregelatinized, re-dried starch that instantly thicken even a cold liquid. Not much used in sauce making and extensively used in Bakes shop.
- **Bread Crumb** – Crumbs will thicken a liquid very quickly because they have already been cooked, like instant starches. Breadcrumbs may be used when smoothness of the texture is not desired.



- **Liaison-Eggs yolk and cream.** Egg yolk have the power to thicken a sauce slightly due to coagulation of eggs proteins when heated. Pure egg yolks coagulate at about 140<sup>0</sup> F to 158<sup>0</sup> F i.e. 60<sup>0</sup> C to 70<sup>0</sup> C, for this reason, they are beaten with heavy cream before use, because it increases its coagulation temperature to 180<sup>0</sup> F to 185<sup>0</sup> F (82<sup>0</sup> C to 85<sup>0</sup> C). Liaison is used primarily to give richness of flavor and smoothness of texture.
- **Heavy Cream-** Also adds thickness and flavor to the sauce.
- **Blood-**Also adds thickness to the sauce.

### Additional seasoning and flavoring ingredients

We can use different flavoring and seasonings to give the sauce taste and aroma. The different herbs and spices may be salt, pepper powder, marjoram, basil, thyme, sage, lemon grass, lemon rind, Monosodium glutamate, rosemary, celery, parsley, bay leaf, cheese, etc.

### *Roux*

Equal quantities of fat and flour, cooked to varying degrees to achieve a desired color and consistency in a sauce/ liquid.

Starches like flour helps to thicken the sauce by the process of gelatinisation.

In gelatinisation, starch cells absorb water and if more water is present, starch cells burst and become soluble in water and this makes the liquid to thicken, to regulate the thickening and to check the desired color, roux is cooked.

### *Ingredients for roux*

#### **Fat**

- Clarified butter – Is used to make the finest sauces because of its flavor, clarified butter contains a very little moisture and it does not gelatinize the starch completely and doesn't make the roux hard to work.
- Margarine – Widely used in place of butter because of its lower cost. However, its flavor is inferior to butter and does not make as fine a sauce.
- Animal fat – Chicken fat, beef drippings and lard, are used when their flavor is appropriate to the sauce. E.g. chicken fat for chicken veloute and beef dripping and lard for beef gravy. When properly used animal fat can enhance the flavor of the sauce.
- Vegetable oil or shortening – Can be used as for roux but has no flavor, solid shortening has a disadvantage of having a high melting point, thus it gives unpleasant fuzzy feeling in mouth, hence best for bakeshop.

**Flour:** The thickening power of flour depends in part on its starch content, there are different types of flour like cake flour, and bread flour and wheat flour, depending upon the starch, and fat should be added. Bread flour has less starch and more protein than cake flour.

**Preparing Roux:** Roux is cooked to remove the raw, starchy taste of the flour, to reach a desired consistency and color. There are basically 3 types of roux.

1. White roux – Prepared or cooked for a very less time to remove a raw taste of flour. Cooking should be stopped as soon as the roux has gained sandy texture, before it begins to color. Used for Béchamel sauce, or other white sauces, based on milk.
2. Blonde or pale roux – Cooked for a longer time till the roux attains light golden color. Blonde roux is used for veloutes, sauces based on white stocks. The sauces have a pale ivory color.

3. Brown roux – is cooked until it takes on a light brown color and a nutty aroma. Cooking must take place over a low heat so that the roux browns evenly without starching. For a deeper brown roux flour must be browned in an oven before adding fat.
4. A browned roux has 1/3 rd the thickening power of white roux. but contributes flavor and color to brown sauces.

Incorporating the Roux to liquid

- Liquid may be added to roux or roux may be added to the liquid.
- Liquid should be hot when the roux is cold and when the roux is hot, the liquid should be cold. But never add chilled liquid, as it will solidify the fat granules

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## 3.9 EGG PREPERATIONS

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**Dry-Heat Preparation:** Dry-heat preparation of eggs primarily involves frying and baking. Egg dishes that are commonly fried are fried eggs, scrambled eggs, and omelets. Baked egg dishes include shirred eggs, meringues (both soft and hard), and soufflés. These dry-heat methods are now further discussed.

**Frying:** A frying pan, a sauté pan (omelet pan), or even a griddle can be used to fry eggs. Cast iron pans work best for eggs if the pans are primed or seasoned. Priming is accomplished by rubbing a clean frying pan with a thin layer of vegetable oil and setting it on moderate heat, which is then briefly increased to high. Then it is removed from the heat and allowed to cool. Washing the frying pan with soap or cooking anything but eggs in it removes the primed surface. Nonstick pans do not need to be primed or seasoned. Frying is used to prepare fried and scrambled eggs and omelets.

**Fried Eggs:** For each fried egg, about 1 teaspoon or less of butter, margarine, or oil is added to a hot pan. Clarified butter can also be used; it will not burn like regular butter. To cut down on fat, a bit of fat may be spread on the pan's surface with a paper towel or waxed paper, or a vegetable spray may be applied to its surface before heating. Too little fat causes sticking, but excessive fat will result in greasy eggs. The fat should be hot enough to prevent the eggs from running, but not so hot that it toughens the egg proteins. The temperature is just right when a drop of water dropped into a hot pan sizzles instead of either rolling around or instantly vaporizing into the air. Yolks are less likely to break open when the eggs are cracked if the eggs are allowed to warm very briefly in a bowl of hot water. Broken yolks can also be avoided by using fresh eggs and/or by first breaking the eggs into a bowl or other container rather than dropping them directly from the shell into a frying pan or griddle. Then, once the pan and the fat have been heated to the right stage, the eggs should be slid from the bowl, no more than two at a time, onto the pan or griddle. The heat should be lowered immediately to medium-high. Coagulation is then allowed to occur according to the following “cook-to order” stages:

- **Sunny-side up**-The egg is cooked until the white is set and the yolk is still soft. The egg is not flipped. Sunny-side up eggs may not be sufficiently cooked to eliminate bacteria, and thus some state health departments do not allow them to be served to the

public. Covering the pan with a lid during cooking gives the yolk a rather opaque appearance, but eliminates any risk of an undercooked egg.

- **Over easy**-The eggs are flipped over when the whites are 75 percent set. Cooking continues until the whites are completely cooked but the yolks are still soft.
- **Over medium**-The same as over easy, except that the yolks are partially set.
- **Over hard**-The same as over easy, except that the yolks are completely set.

**Scrambled Eggs:** Scrambled eggs are beaten while raw until well blended and may be seasoned with salt and pepper or other seasonings. Liquid in the form of milk, cream, or water may be added to impart more body and/or flavor and a soft, creamy texture. The added liquid, a tablespoon or less for each egg, creates steam during cooking, which lifts the eggs and makes them lighter and fluffier. Too much liquid makes the eggs watery and forms small, tough, curd-like masses. The beaten egg mixture is poured onto a heated surface, the heat is reduced, and the eggs are gently stirred as soon as they begin to coagulate. Too much stirring will break the egg into too many small pieces, so it is better to lift the cooked egg repeatedly with a spatula so the undercooked portions may slide underneath rather than literally to stir them. Scrambled eggs are finished cooking when they are set, yet still soft and moist. Like most egg dishes, they are best when served immediately. In restaurants or when cooking for large crowds, it is recommended that scrambled eggs be prepared in small batches, generally 3 quarts or less at a time.

**Omelets:** When eggs are beaten, cooked, and rolled into a cigar shape or folded into a flat half circle, the resulting dish is called an omelet. Both plain (French or American-style) and puffy (fluffy) omelets can be prepared with or without fillings. Omelet preparation is considered so important by chefs that it is not unusual for a job applicant to be asked to chop an onion and make an omelet as part of the interview process. Plain omelets consist of whole eggs, beaten, seasoned as desired, and poured into a prepared pan heated to medium-high. Once the mixture is in the pan, the heat is lowered to medium, and the mixture is not stirred. Uncooked portions are allowed to cook by lifting just the edges of the omelet with a spatula so the runny mixture flows underneath. When the top is firm, the omelet can be folded in half, rolled and folded over itself, or rolled and slid onto a dish. If fillings are to be added, they are placed on top of the omelet just before it is folded.

**Baking:** Baking eggs and their ingredients leads to several different egg dishes: shirred eggs, meringues, and soufflés.

**Shirred Eggs:** Whole eggs that are baked and served in individual dishes are called shirred eggs. The egg is cracked, gently placed into a cup from which it can be rolled into a container coated with butter or margarine, and then baked in an oven at 350°F (177°C) until cooked to order.

**Meringue:** A meringue is egg white foam used in dessert dishes as a pie topping, a cake layer, or as frosting. It may also serve as a dessert on its own or be combined in other ways with dessert ingredients. Meringues are made by whipping egg white into foam and adding sugar, the amount of which determines whether the meringue is soft or hard. Soft meringues are made with about 2 tablespoons of granulated (preferably superfine) sugar per egg white and are often used as pie toppings (e.g., lemon meringue pie). The sugar is gradually added to the egg whites—three will cover an average pie—and the mixture is whipped to the soft peak stage. The meringue is then

spread immediately over the still-warm filling. A warm filling is necessary so the egg-white proteins can coagulate and bind to it. The whole pie with the meringue is then baked in the oven at between 325°F (163°C) and 350°F (177°C) for about 15 minutes. A temperature that is too low dries the meringue; a temperature that is too high shrinks it. Some problems that can occur when preparing soft meringues are shrinking, weeping, and beading.

- **Shrinking-** To prevent the meringue from shrinking back and leaving an unsightly gap around the outside edges of the pie, it should be spread to slightly overlap the entire perimeter of the crust.

- **Weeping-** Also known as syneresis, weeping may be caused by under-beating the eggs, which leaves unbeaten whites on the bottom of the beating bowl, or by under-coagulation, created, for example, by placing meringue on a cold pie filling. A meringue can be protected from weeping by adding a teaspoon of cornstarch to the sugar before beating it into the egg whites.

- **Beading-** Un-dissolved sugar is the main cause of beading, but overcooking (over-coagulation) also contributes to this phenomenon. Beading can be avoided by using shorter cooking times and increasing the temperature up to 425°F (218°C). Hard meringues are usually baked as cookies, but they can be formed into different shapes and used as decorations on puddings or other desserts. They are prepared with twice the amount of sugar used in soft meringues, about 4 tablespoons (¼ cup) per egg white. Confectioner's sugar is preferred over granulated sugar for use in hard meringues, because it is more evenly distributed through the beaten egg whites and lacks a gritty texture. Egg whites are beaten to the stiff stage, the sugar is beaten in, and the resultant meringue is shaped, placed on a parchment-covered baking sheet, and baked at the low temperature of 225°F (107°C) for about an hour or longer, depending on the size of the individual portions. When the meringue is delicately browned and the end product firm, the oven is turned off, the door left open, and the meringue left in the cooling oven for at least 5 minutes. Once the meringue is removed from the oven, the remainder of the cooling period should occur in a warm place free of drafts.

**Soufflés:** A soufflé is actually a modified omelet. The main ingredients of a soufflé are a thick base generally made from a white sauce or pastry cream, egg-white foam, and flavoring ingredients. Initially, the egg yolks and whites are separated. A thick white sauce or pastry cream is prepared and combined with the egg yolks. Stiffly beaten egg whites are folded into the thick egg yolk mixture (Figure 12-13). For a main dish soufflé, flavoring ingredients such as diced or grated cheese, cooked meat, cooked seafood, and/or vegetables and seasonings are added to this mixture. Dessert soufflés will include sweet ingredients like sugar, chocolate, or fruit, but the process is the same. Whichever the type of soufflé, the entire combination is gently poured into a lightly greased soufflé dish or other deep baking dish, placed in a larger pan of hot water, and baked in a moderate (350°F/177°C) oven for 50 to 60 minutes or until delicately browned and firm to the touch. Small, individual soufflés will take less time. The oven door should not be opened during baking until time to check for doneness, because it creates a draft that can cause the soufflé to fall. Doneness is determined by gently shaking the oven rack. If the center jiggles, even slightly, more baking time is required. When combining beaten egg whites with other heavier mixtures, it is best to pour the heavier mixture onto the beaten egg whites. Then

gradually, using a spoon or rubber spatula, combine the ingredients with a downward stroke into the bowl, across, up, and over the mixture. Come up through the center of the mixture about every three strokes and rotate the bowl during folding. Fold just until there are no streaks remaining in the mixture. Avoid stirring, which will force air out of the egg whites.

### **Moist-Heat Preparation**

Eggs can be prepared by moist heat using a variety of methods. Most common among these are “boiled” eggs, coddled eggs prepared in a cup, poached eggs, a variety of custards, and eggs that are prepared using the microwave. In all cases, eggs are cooked at simmering temperatures. Each of these methods and some of the egg dishes produced are now discussed in more detail.

**Coddling:** Coddled eggs are prepared by breaking an egg into a small cup, called a coddler, made of porcelain or heat-proof glass with a screw-on top, and submerging the whole coddler in simmering water until the egg is cooked. The coddler should be buttered or greased before adding the raw egg. Cream or other flavorings such as ham or bacon are sometimes added before cooking. Once done, the egg is eaten directly out of the coddler.

**Poaching:** Eggs are poached by being cracked and simmered in enough water to cover the egg by at least twice its depth. Fresh USDA Grade AA eggs are best to use for poaching, because the whites are firmer and less likely to spread out in the water and create streamers, floating strands of partially cooked egg whites. Salt ( $\frac{1}{2}$  teaspoon per cup) and/or vinegar (1 teaspoon per cup) may be added to the water to speed coagulation and help to maintain a compact, oval shape of the egg. On the other hand, salt or vinegar will give the cooked egg a shinier, tougher, and, perhaps, more shriveled surface than the one cooked in plain water. Poached eggs are cooked for 3 to 5 minutes, removed with a slotted spoon, drained, trimmed of any streamers, and served immediately. The well-poached egg should have a firm yolk and compact white. Poached eggs are commonly used for eggs Benedict, consisting of an English muffin layered with a slice of ham or Canadian bacon, followed by a poached egg, and topped with a dollop of hollandaise sauce.

**Custards:** Custards are mixtures of milk and/ or cream, sweeteners (sugar, honey), flavorings (vanilla, nutmeg, etc.), and eggs or egg yolks. Custards are thickened by the coagulation of egg proteins during cooking. These egg proteins denature when heated and recombine to form a network that sets or coagulates, at the right temperature, to form the solid gel of custard. All custard dishes are very susceptible to microbial contamination and should be covered and refrigerated as soon as possible after preparation. Custards are distinguished by whether they are sweet or savory, and by their preparation method: stirred or baked.

### **Hard or Soft “Boiled”**

Although the term hard-boiled eggs are commonly used, eggs should actually be simmered and never boiled, because they will become tough and rubbery if so treated. The high heat of boiling also transforms the iron in the egg yolk into ferrous sulfide, causing the greenish-black color and unpleasant flavor found in the yolk of overly hard-cooked eggs. There are two methods for hard-cooking eggs: hot start and cold start. Each has advantages and disadvantages; each produces acceptable products.

**Hot-Start Method** In the hot-start method, the water is heated to boiling and then the eggs are completely immersed in the boiling water. The heat is immediately reduced to simmer, and the eggs are cooked for 3 to 15 minutes, depending on the desired doneness:

- Soft 3 to 4 minutes
- Medium 5 to 7 minutes
- Hard 12 to 15 minutes

The cooked eggs are drained and then rinsed under cold running water to stop further cooking from residual heat. The extreme temperature change from hot to cold also helps loosen the egg's membrane from the shell, making it easier to peel. To further ease peeling, the first crack should be made at the air cell located at the larger end of the egg, and then the egg rolled gently between the hands to break the shell all over. Peeling under cold running water also makes the job easier. Fresher eggs are harder to peel because the air cell is smaller and the membrane is tight against the cell wall. Although the larger air cell and higher pH of older eggs makes them easier to peel, they also tend to break more easily during heating. The benefits of using the hot-start method are greater temperature control, eggs that are easier to peel, and a shorter total cooking time. A drawback is that lowering the eggs into boiling water may cause them to crack.

**Cold-Start Method** In the cold start method, the eggs are placed in a saucepan with enough cold water to cover them by at least an inch. The water is brought to a boil, immediately lowered to a simmer, and the eggs are then cooked to order:

- Soft 1 minute
- Medium 3 to 5 minutes
- Hard 10 minutes

Another way to prepare hard-cooked eggs from a cold start is to remove the pan from the heat as soon as the water boils, cover it tightly, and let it stand for 20 minutes. Cold-start eggs are less likely to crack during cooking. The advantages to the cold-start method are that less attention to the process is required, the eggs are easier to add to the water, and they are less likely to break. On the other hand, starting eggs out in cold water may cause the egg white by the shell's surface to be more rubbery, and there is a greater chance of a greenish tint forming on the egg white. Once cooked, eggs can be cut into slices or wedges using the slicing equipment. Dipping the knife in hot water before slicing keeps the hard-cooked eggs from falling apart. To tell a hard-cooked egg from a raw one, spin the egg on its side. A smoothly spinning egg is hard cooked, while one that wobbles out of balance is not.

**Custards:** Custards are mixtures of milk and/ or cream, sweeteners (sugar, honey), flavorings (vanilla, nutmeg, etc.), and eggs or egg yolks. Custards are thickened by the coagulation of egg proteins during cooking. These egg proteins denature when heated and recombine to form a network that sets or coagulates, at the right temperature, to form the solid gel of custard. All custard dishes are very susceptible to microbial contamination and should be covered and refrigerated as soon as possible after preparation. Custards are distinguished by whether they are sweet or savory, and by their preparation method: stirred or baked.

### **Sweet and Savory Custards**

Sweet custards are served as desserts in the form of puddings or as fillings for éclairs and pies. Savory (non-sweet) custards are used for dishes such as quiches. A popular quiche made with bacon and Swiss cheese is known as quiche Lorraine.

**Stirred Custard (Soft Custard or Custard Sauce)**

The ingredients of this custard are stirred while being heated on the range over low heat or in a double boiler. The mixture retains a smooth, creamy, fluid consistency. Stirred custard is often eaten as a pudding; however, it may provide the base for many frozen desserts; be served as a sauce for cake, fruit, and other desserts; or be used to replace eggnog. The repeated stirring prevents the formation of a gel, so the custard mixture thickens instead of gels.

**Baked Custard:** Baked custards are actually an example of dry-heat preparation. Both types of custards begin with the same ingredients, but are simply heated differently. Baked custard mixes are poured into ungreased custard cups that are placed in the oven, usually in a water bath (bain-marie), where they sit undisturbed and gel during baking. A water bath is made by filling a large, low-sided pan with 1 inch of hot water, into which the cups containing the custard mix are placed. The layer of water insulates the cups and prevents the outside of the custard from cooking to completion before the inside has had a chance to coagulate.

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**CHECK YOUR PROGRESS-II**

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Q. 1 Define stock? Where all it can be used?

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Q2. What do you mean by weeping?

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Q3. What do you mean by the terms “Sunny side up” and “Over easy”?

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**3.10 SUMMARY**

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Cooking can be defined as the transfer of energy from one source to another. This energy alters the foods molecular structure, changing its texture, flavor, aroma and appearance.

The cooking methods used to transfer heat: broiling, grilling, roasting and baking, sauteing, pan-frying, deep-frying, poaching, simmering, boiling, steaming, braising and stewing.

Each method is used for many types of foods, so you will be applying one or more of them every time you cook. In cooking, there are some basic methods of cooking that are used. These commonly used basic cooking methods are divided into three general groups. The groups are: Dry heat cookery methods and Moist heat cookery methods and the combination method. The methods of cooking are divided into these three groups because of the way food is cooked and the type of heat that is used.

Moreover this chapter makes us understand

- Different types of stocks and their preparation, use and storage.
- Different types of egg preparations
- Mise-en-place before start of work.
- Effective techniques required for preparing a successful meal.

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## 3.11 GLOSSARY

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1. **Conduction**- When heat moves (conducts) directly from one item to the other, which is in contact with it. For example from the top of the range to a pot placed on it, from the pot to the milk inside etc.
2. **Radiation** -Radiation occurs when energy is transferred by waves from the source to the food. The waves themselves are not actually heat energy, but are changed into heat energy when they strike the food being cooked
3. **Gratinating**-To cook with a covering of buttered crumbs or grated cheese until a crust or crisp surface forms.
4. **Fricasseing or fricassee**-This is a method of cooking meat in which it is cut up, sautéed and braised.
5. **Sous vide cooking**- Sous-vide cooking-is a method of food preparation where the prepared food is cooked in a sealed plastic pouch from which all or much of the air has been removed to prevent oxidation of the food.
6. **Julienne**. Sliced food can be further cut up, or julienned, resulting in delicate sticks that are usually 1 to 3 inches long and only 1/16 to 1/8 of an inch thick.
7. **Shred**: to cut into thin strips, either with the coarse blade of a grater (manual or power) or with a chef's knife
8. **Breading**-Breading means coating a product with bread crumbs or other crumbs or meal before deep-frying, pan-frying, or sautéing.
9. **Mirepoix** -A mirepoix (meer-pwah in French pronunciation) is diced vegetable cooked for a long time on a gentle heat without colour or browning, usually with butter or other fat or oil.
10. **Bouquet garni** an assortment of fresh herbs and other aromatic ingredients tied in a bundle with string.
11. **Remouillage**-It is prepared by simmering bones and mirepoix for a second time.
12. **Court Bouillon** -Or short broth, is often prepared as the cooking liquid for fish by simmering aromatic vegetables in water with an acid such as wine or vinegar.
13. **Beurre manie** – It is a mixture of equal parts of soft, raw butter and flour worked together to form a smooth paste.
14. **Roux**-Equal quantities of fat and flour, cooked to varying degrees to achieve a desired color and consistency in a sauce/ liquid.



15. **Meringue**-A meringue is egg white foam used in dessert dishes as a pie topping, a cake layer, or as frosting.

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## CHECK YOUR PROGRESS-I ANSWERS

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1. Dry method of cooking involves the following:
  - i. Baking
  - ii. Broiling
  - iii. Grilling
  - iv. Gratinating
  - v. Roasting (Spit,pot,oven)
  - vi. Frying (deep fat, shallow fat)
  - vii. Sautéing
  - viii. Stir-frying
  
2. In deep fat frying the food is completely immersed in hot fat and, therefore, a large quantity of fat is required. The correct temperature of fat is a very important part of this method of frying. If the fat is overheated it spoils both the food and fat while if it is not hot enough the food breaks up thereby absorbing fat and thus making it unfit for consumption. Almost all foods require a coating before they are to be fried because not only the juices and flavour of the food are to be kept in put the fat must be kept out.  
Where as in shallow fat frying very little fat is used and the food to be cooked is turned over so that both sides are cooked. Generally this method is applied to precooked food unless the food takes very little time to cook (omelets, liver etc.). Some foods contain sufficient fat and additional fat is not necessary e.g. bacon. In this case it is known as “Fatless frying”.
  
3. Sous-vide cooking-is a method of food preparation where the prepared food is cooked in a sealed plastic pouch from which all or much of the air has been removed to prevent oxidation of the food. This is different from the preparation of “boil in bag” products, which are cooked and portioned before being sealed in plastic bags. The fresh food is prepared or par-cooked under strict hygienic conditions and placed into a specially designed vacuum packing machine, where the neck is sealed. Cooking is done under controlled temperature in convection ovens between 700C to 1000C. Sous –vide cooking is suitable for Hospitals, railway catering, flight catering, cruise lines etc.

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## 3.13 CHECK YOUR PROGRESS-II ANSWERS

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1. Stock may be defined as a is a thin, clear, flavourful, nutritive liquid prepared by extracts from meat, poultry and fish and their bones and from vegetables and seasonings. It can be used in the preparation of soups, sauces and gravies.
2. It is also known as syneresis, weeping may be caused by under-beating the eggs, which leaves unbeaten whites on the bottom of the beating bowl, or by under-coagulation, created, for example, by placing meringue on a cold pie filling. A

meringue can be protected from weeping by adding a teaspoon of cornstarch to the sugar before beating it into the egg whites.

3. Sunny side up- The egg is cooked until the white is set and the yolk is still soft. The egg is not flipped. Sunny-side up eggs may not be sufficiently cooked to eliminate bacteria, and thus some state health departments do not allow them to be served to the public. Covering the pan with a lid during cooking gives the yolk a rather opaque appearance, but eliminates any risk of an undercooked egg. Where as in over easy the eggs are flipped over when the whites are 75 percent set. Cooking continues until the whites are completely cooked but the yolks are still soft.

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### 3.15 TERMINAL QUESTIONS

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#### Short answer type questions:

1. What is the difference between:
  - a. Mis-en place and misen-scene
  - b. Broiling and griddling
  - c. Hardboiled egg and soft boiled egg
  - d. Sautéing and gratinating
  - e. Fricasseing and braising
  - f. Bouquet garni and sachet-de-epices
  - g. Fumet and court bouillon
  - h. Meringue and soufflé
  - i. Spit roasting and oven roasting

- j. Coddling and custard
  - k. Espagnole and Bechamel
2. Pot roasting is different from pan roasting. Explain.
  3. Stir-frying is similar to sautéing. Comment.
  4. How can you keep your knife clean and sharp?
  5. What do you mean by blanching? Why is it important?
  6. What steps can be followed for effective meal preparation?
  7. Write a note on mirepoix.
  8. How will you prepare scrambled egg?
  9. Write the process of boiling of eggs.
  10. Classify sauces. Write down the derivatives of any three of them.
  11. What is Roux? What is its function in cookery? Describe different types of Roux.

**Long answer type questions**

1. Explain in detail the combination methods of cooking.
2. Explain all the cutting styles adopted by the chefs.
3. Write in detail about marination process.
4. Explain the different mixing techniques.
5. Classify stocks? Explain in detail the preparation of any one of them.
6. What are the modern developments in the cooking methods? Explain.
7. Explain in detail the mis- en- place to be done before actual cooking?
8. Explain the principles of stock making elaborately.
9. What is meringue? How is it prepared?
10. Write in detail at least three methods of moist heat preparation of egg

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## UNIT-4

# FOOD COMMODITIES

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### STRUCTURE

- 4.1 Introduction
- 4.2 Objective
- 4.3 Classification
  - 4.3.1 Cereals and millets
  - 4.3.2 Pulses and legumes
  - 4.3.3 Vegetables
- Check your progress-1
  - 4.3.4 Mushrooms
  - 4.3.5 Fruits
  - 4.3.6 Eggs
  - 4.3.7 Foundation ingredients
- Check your progress-2
- 4.4 Summary
- 4.5 Glossary
- 4.6 Check your progress-1 answers
- 4.7 Check your progress-2 answers
- 4.8 Reference/bibliography
- 4.9 Terminal question

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## 4.1 INTRODUCTION

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A commodity starts as any item that has a value. Food commodities are commonly consumed foods are those ingested for their nutrient properties. Food commodities can be either raw agricultural commodities or processed commodities, provided that they are the forms that are sold or distributed for human consumption.

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## 4.2 OBJECTIVE

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

- The characteristics and behavior of the basic food ingredients.
- Their types
- Their uses in cookery
- Their purchasing criteria and
- Their storing method

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## 4.3 CLASSIFICATION

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**Classifying commodities:** The stores are a vital part of any commercial kitchen. Did you know that at any given time the stores here can contain up to 900 unique items? Many of which have special storage requirements. Fortunately, most commodities can be classified into one of three categories, making it easy to sort them ready for proper storage. The three categories are:

- Perishable
- Semi-perishable
- Non-perishable

**(A) Perishable commodities**

Perishable commodities are those commodities which deteriorate quickly when not stored properly. Perishable commodities usually require some sort of refrigerated storage.

1. **Dairy products and eggs:** Dairy products are those commodities, which are derived from or based upon milk, and include creams, yoghurts, butter, cheese and ice cream. Milk needs to be stored in the refrigerator at a temperature between 3 to 4°C. If stored this way fresh milk will last about 10 days. Cream, yoghurts, butter, cheese and eggs should also be stored at between 3 to 4°C. The shelf life of these products will vary depending on their method of manufacturing, and you should check individual use by dates on the packaging. Ice cream needs to be kept frozen at a temperature of -18°C or below. All dairy products need to be kept well sealed when in storage; otherwise they will absorb flavours from strong smelling foods around them.
2. **Meat and poultry:** Meat and poultry should be stored between 1°C and 3°C. All meat and poultry should be stored on clean trays and covered with plastic wrap. You should never store raw and cooked foods on the same tray. Meat can be stored in the cool room for 4-6 days, or if vacuum-sealed up to 12 weeks. Poultry can be kept for 3-4 days. If frozen, meat and poultry can be kept for up to six months.
3. **Fish:** Fish has a very short shelf life and must be stored with extra care. It should be stored at 1°C. Unfortunately most cool rooms are not set for temperatures as low as this, so seafood should be wrapped in plastic film and stored in the coldest part of the cool room on a bed of crushed ice. If kept in these conditions fish should last for 5 to 6 days. Live fish such as octopus, pomfret, crabs and snails should be kept at temperatures between 1°C to 3°C in sealed containers. Frozen fish can be kept in the freezer for up to 3 months.
4. **Cooked foods and leftovers:** These are also considered perishable and should be stored in the cool room at between 3 to 4°C. Cooked foods should be covered before storage and need to be stored separate from raw foods and never on the same tray. Always allow hot foods to completely cool prior to refrigeration.
5. **Fruit and vegetables:** Fruit and vegetables vary in their storage requirements, but as a general rule most fruit and vegetables should be stored between 5°C and 9°C. There are a couple of exceptions such as broccoli, which usually arrives packed on ice, and should be stored at 1°C, and tropical fruits such as bananas and pineapples which should be stored at around 18°C. Because fruit and vegetables require a higher temperature storage (between 7°C and 10°C) they are best kept in a separate cool room. Lettuce, cabbage and other leafy vegetables should be stored in the cool room, where the temperature is below 5°C. Root vegetables, such as carrots, potatoes and onions are classed as semi-perishable and do not require refrigeration. Frozen vegetables and fruit are stored in a deep freezer where the temperature is set at -18°C or less. Processed vegetables and fruit come in cans,

jars, and packages. They should be stored on shelves in a cool dry room away from sunlight. It is important to rotate this stock.

### **(B) Semi-perishable commodities**

Semi-perishable commodities are those that do not require refrigeration, but still have a limited shelf life. They include things like potatoes, onions, ginger, garlic, pumpkins and salamis. These items are usually kept on shelves in the storeroom complex, where they get plenty of air circulation around them. Potatoes need to be kept away from light as they will start sprouting.

### **(C) Non-perishable commodities**

Technically speaking there is no such thing as non-perishable commodities, as all goods deteriorate overtime. But some commodities deteriorate so slowly that they are called non-perishable. Examples of non-perishable goods are:

- Flour
- Spices and dried herbs
- Canned foods
- Nuts
- Cereals and millets
- Pulses and legumes
- Dried packet goods, for example noodles and pasta
- Fats and oils
- Tea and coffee
- Cocoa
- Sugar
- Salt
- Acids and chemicals

These items are usually kept in the dry store where they are kept cool and are protected from moisture contamination. Dry goods like flour, grains and pasta often come in bags or sacks, and are not safe from vermin or weevils and should be transferred to clean storage bins with tightly fitting lids. Some jars, such as caviar, are actually perishable and should be stored appropriately.

Food Commodities can also be classified in the following ways:

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#### **4.3.1 CEREALS AND MILLETS**

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Cereal crops or grains are mostly grasses cultivated for their edible grains or fruit seeds. The word 'cereal' is derived from 'Ceres', the name of the pre-Roman goddess of harvest and agriculture. Cereal grains supply most of their food energy as starch. They are also a significant source of protein, though the amino acid balance, with exceptions as noted below, is not optimal. Whole grains are good sources of dietary fiber, essential fatty acids, and other important nutrients. Rice is eaten as cooked entire grains, although rice flour is also produced. Oats are rolled, ground, or cut into bits (steel-cut oats) and cooked into porridge. Most other cereals are ground into flour or meal, which is milled. The outer layers of bran and germ are removed. This lessens the nutritional value but makes the grain more resistant to quality deterioration and makes the grain more appealing to many palates. Once (optionally) milled and ground, the resulting flour is made into bread, pasta, desserts, dumplings, and many other products. Besides cereals, flour is sometimes made from potatoes, cassava, cooking banana, chestnuts and pulses (especially chickpeas, which is known as besan).

Cereal grains are grown globally in extensive areas covering millions of hectares and provide more energy worldwide than any other type of crop; they are therefore staple crops. In developed nations, cereal consumption is moderate and varied but still substantial. The cereal grains belong to the monocotyledonous family, *Gramineae* or grass family. The word cereal is derived from the word *Ceres*, the Roman Goddess of grain. The principal crops are rice, wheat, maize or corn, jowar, ragi.

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:

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

Composition:

Carbohydrate	95 %
Proteins	5 %
Minerals	3%
Vitamins	1 %

**Uses of Wheat Products:**

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

**Wheat flour**

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

**Composition of flour:**

Flour contains the following ingredients:

Starch	70%
Moisture	14%
Protein	11.5%
Ash	0.4%
Sugar	1%
Fat or lipid	1%
Others (enzymes)	2.1%

**Types of Flour**

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



wheat kernels are grounded finely and the bran and germ is separated. This separated bran and germ is again finely grounded and mixed with the endosperm flour.

### Functions of Flour in cookery

#### a. Provides structure

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

#### b. Absorbs liquids

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

#### c. Contributes flavor

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

#### d. Contributes color

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

#### e. Adds nutritional value

Essentially all flours and grain products contribute complex carbohydrates (starch), vitamins, minerals, and protein.

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

Composition:

Carbohydrates	72 – 75 %
Proteins	7%
Minerals	8 % (iron, phosphorus, calcium and trace elements)
Enzymes	amylase, protease, lipase, oxidases, phenolases
Pigments	anthocynins and carotenoids

There are three main types used:

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

**Types:**

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

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

**Method 1.**

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

**Method 2.**

1. Soaking the grains in water at 65 – 70<sup>0</sup>C for 3 - 4 days.
2. Draining and steaming for 5 – 10 minutes in the same vessel.
3. Drying in the sun or mechanical driers.

**Advantages of Par-boiling**

- De-husking rise is easy as the grains become tougher than the bran.
- This rice has greater resistant to insects and fungus.
- Loss of nutrients is decreased as the minerals and vitamins seep into the endosperm during par boiling.
- Improves digestibility.
- It swells more when cooking.
- It stabilizes the oil content of the bran.

**Dis-advantages of Par-boiling**

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

**Rice products:**

1. Boiled rice – plain, pulaos, Biriyanis.

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

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

**Varieties of corn:**

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

Composition:

Protein	11 %
Carbohydrate	70 %
Water	20 %

Other minerals and vitamins

**Products of Maize:**

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

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

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

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

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

**Oats:** Oats are highly nutritious and filled with cholesterol-fighting soluble fiber. They also have a pleasant, nutty flavor. Oat is the only cereal containing a globulin or legume-like protein, *avenalin*, as the major (80%) storage protein. Globulins are characterized by water solubility; because of this property, oats may be turned into milk but not into bread. Most of us are familiar with rolled oats, which are used as a hot breakfast cereal and cookie ingredient, but many health food stores also stock oat groats and oat bran.

**Oat varieties:**

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

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

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

**Uses:**

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

**Bajra**

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

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

**Uses:**

- They can be cooked as rice or parched or milled to flour to prepare roti or bhakari.

- Sometimes eaten as parched
- The grain is suitable for the preparation of malt.

### Ragi

Ragi is known as finger millet constitutes over 25% food grains in India. Pulses are considered as poor man's meat due to their high protein content ranging from 20 to 40% and this makes them important in human food from nutrition point of view. It is widely consumed practically without any refining by the poorer section of the population. Nutritionally it is almost as good as or better than wheat or rice. The major proteins of ragi are *prolamins* and *glutelins* and they appear to be adequate in all the essential amino acids. Ragi is rich in minerals especially calcium. It is also rich in fiber. It is also rich in phytate and tannin and hence interferes with mineral availability. It contains B-vitamins but is poor in B<sub>2</sub>.

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

Uses:

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

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### 5.3.2 PULSES AND LEGUMES

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

#### Varieties of Pulses:

**1. Dry beans:** Dry bean is high in starch, protein and dietary fiber and is an excellent source of iron, potassium, selenium, molybdenum, thiamine, vitamin B<sub>6</sub>, and folic acid.

Example:

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

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

Example:

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

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

Example: Green peas

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

Example: Chick pea (chana)- desi or kabuli

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

Example: Soya beans

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

Example: Toor (Arhar) dal

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

Example: Red lentil ( masoor), Black lentil (Urad dal)

**Nutritive value:** Pulses are good sources of protein and carbohydrate and therefore help to provide the body with energy. With the exception of the Soya bean, they are completely deficient in fat.

Uses of pulses:

- Preparation of variety of dals
- Preparation of soups, stews, and salads
- Preparation with meat dishes-Dalcha.
- Preparation of breads- dal bati
- Preparation of sweets- Jhangri, Mohan thaal, imarti
- Preparation of masalas- rasam masala , sambhar masala ,

**Selection of cereals:**

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

**Storage of cereals:**

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

**Role of Cereals in cookery:**

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

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

Lumps can be prevented by: -

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

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### 5.3.3 VEGETABLES

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Vegetables refer to plants or parts of plants that are used as food. Vegetables may consist of the entire plant, as, for example, the beet; the stem, as asparagus and celery; the root, as carrot and turnip; the underground stem, or tuber, as the white potato and onion; the foliage, as cabbage and spinach; the flower of the plant, as cauliflower; the pods, which hold the seeds of the plant or the seeds themselves, as peas and beans; or that which in reality is fruit, although for table use always considered a vegetable, as the tomato and eggplant.

Because of this large assortment, vegetables afford the greatest possible variety in flavor, appearance, texture, quality, and food value. They therefore assume a place of very great importance in the diet of individuals and in the plans of the housewife who has all the meals to prepare for her family. In fact, there is scarcely a meal, except breakfast, at which vegetables are not served. For dinner, they form a part or all of each course in the meal, except, perhaps, the dessert, and occasionally they may be used for this. Although two or more vegetables are nearly always served in even a simple meal, the use of vegetables in most households is limited to those few varieties which are especially preferred by the family. As a rule, there are a number of other vegetables that would be very acceptable if prepared in certain appetizing ways. An effort should therefore be made to include all such vegetables in the dietary, for they may be used to decided advantage and at the same time they afford variety in the meals. The constant demand for variety in this food makes acceptable new recipes for the preparation of the vegetables already known and information for the use of the unfamiliar kinds.

Because they are so perishable, vegetables require extra care from receiving to service. Freshness is their most appealing and attractive quality, and one must be especially careful to preserve it. The goals of proper vegetable cookery are to preserve and enhance fresh flavor, texture, and color, and to prepare and serve vegetables that are not just accepted but sought after.



**Classification of vegetables:**

One method of classifying vegetables is to define them by the part of the plant from which they originated. For example, Figure (4 A) shows that vegetables may be derived from almost any part of a plant: roots (carrots, beets, turnips, and radishes); bulbs (onions and garlic); stems (celery and asparagus); leaves (spinach and lettuce); seeds (beans, corn, and peas); and even flowers (broccoli and cauliflower). In addition, there are foods that are routinely called vegetables and used as vegetables, but that are actually fruits. Botanically, fruits are the part of the plant that contains its seeds—specifically, the mature ovaries of plants. If it derives from a flower, then it is usually a fruit. The fruits most often seen masquerading as vegetables include tomatoes, squash,

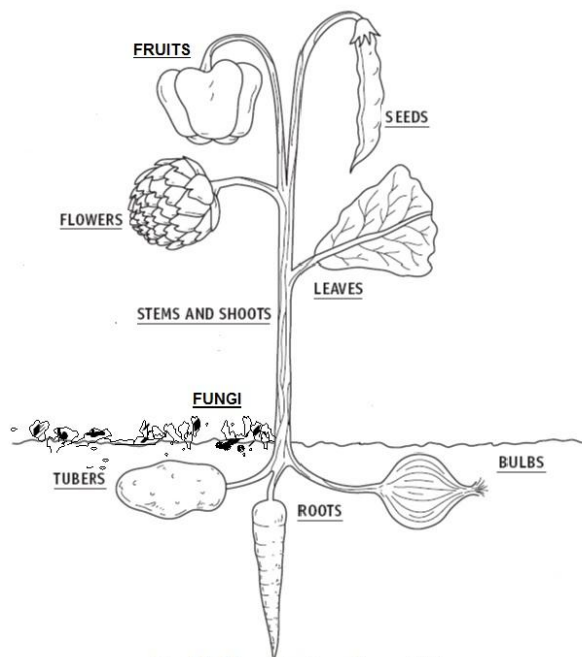


Fig. 4 A Classification of vegetables

tomatoes, squash,

Vegetables are classified according to which part of the plant is eaten. Some vegetables may fall into more than one category when more than one part of the plant is eaten, e.g. both the roots and leaves of beetroot can be eaten.

1. **Bulbs-** Usually grow just below the surface of the ground and produce a fleshy, leafy shoot above ground. Bulbs usually consist of layers or clustered segments. e.g. onion, shallot, garlic, spring onion, leek, fennel.
2. **Flower-** The edible flowers of certain vegetables. e.g. cauliflower, broccoli, gai lan (Chinese sprouting broccoli), brocco flower, globe artichoke.
3. **Fruits-** Vegetable fruit are fleshy and contain seeds. e.g. egg plant, capsicum, courgette, okra, pumpkin, tomato, choko, scallopin.
4. **Fungi** -When referring to vegetables, fungi are commonly known as mushrooms. e.g. button, flats, shitake, oyster, gourmet brown, wood ear, enokitaki, truffle.
5. **Leaves-** The edible leaves of plants. e.g. bok choy, cabbage, lettuce, silver beet, spinach, witloof, puha.
6. **Roots-** Usually a long or round-shaped taproot. e.g. carrot, turnip, beetroot, swede, radish, parsnip, celeriac.
7. **Seeds-** Also know as legumes, seeds are usually obtained from pods. The pod is sometimes eaten along with the seed. e.g. broad been, French bean, pea, snow pea, snake beans, butter beans.
8. **Stems-** The edible stalks of plants when the stalk is the main part of the vegetable. e.g. asparagus, celery, kohlrabi.
9. **Tubers-** Vegetables which grow underground on the root of a plant. e.g. potato, kumara, yam, taro, Jerusalem artichoke, Maori potato.

**Some continental vegetables**

- |             |               |                      |               |
|-------------|---------------|----------------------|---------------|
| 1. Broccoli | 6. Asparagus  | 11. Brussels Sprouts | 16. Marjoram  |
| 2. Kale     | 7. Lettuce    | 12. Kohlrabi         | 17. Truffles  |
| 3. Avocado  | 8. Tomatillos | 13. Artichokes       | 18. Sorrels   |
| 4. Endive   | 9. Shallots   | 14. Leeks            | 19. Fennels   |
| 5. Celery   | 10. Jimca     | 15. Parsnips         | 20. Jalapeños |

**Some Indian vegetables**

- |                    |             |                  |                 |
|--------------------|-------------|------------------|-----------------|
| 1. Brinjal         | 6. Tomatoes | 11. Cauliflower  | 16. Gr. chilies |
| 2. Okra            | 7. Radish   | 12. Cabbage      | 17. Mustard     |
| 3. Pumpkin         | 8. Rhubarb  | 13. Fr. beans    | 18. Gr. peas    |
| 4. Capsicum        | 9. Spinach  | 14. Bitter gourd | 19. Onions      |
| 5. Green coriander | 10. Turnips | 15. Bottle gourd | 20. Mushrooms   |

**COOKING VEGETABLES**

We cook vegetables so that they can be

- a. Easily digestible- as the fibers breakdown with the effect of heat.
- b. Easily mastic able- can be chewed easily
- c. Equal distribution of minerals and nutrients in all parts of the vegetables- as some useful ingredients are present in the skin of the vegetables and when they are cooked, they dissolve in water and get inserted in the flesh of the vegetables.
- d. All harmful bacteria and microorganisms are killed with the effect of the heat.
- e. To preserve them.
- f. To improve color and texture of the vegetable.
- g. To improve the flavor and palatability of the vegetable.
- h. To remove harmful alkaloids.
- i. Vegetables should be cooked just before service, so that they are not overcooked and have become soggy.
- j. If cut unprepared vegetables are needed to be stored, they should be blanched first and then refreshed in iced water and then stored in fridge.
- k. Green colored vegetables must be cooked by adding a pinch of cooking soda (soda bicarbonate) to retain its color. (*Chlorophyll* on cooking losses magnesium which holds the color). The rest of the nutrients present make the vegetables dull brown in color.
- l. Either alkali or acids do not disturb *Carotenoids* in vegetables and therefore their colors are not disturbed while cooking.
- m. White and red vegetables (which have flavanoids pigments) must be cooked by adding a small amount of acid like vinegar or lemon juice to retain its color.
- n. When preparing assortment of vegetables, cook each vegetable separately or one after the other, together in the same liquid depending upon their toughness, so that the final product has all the items evenly cooked.

***Preparation of vegetables before cooking***

- a) All vegetables should be washed before cooking
- b) All scars, bruises and wounds should be trimmed before preparation.
- c) Vegetables should be cut in uniform shape and sizes for even cooking and to retain flavour, nutrients and colour.
- d) Remove all eyes, heads, from the vegetables.

- e) All vegetables which has high iron content or those which are grown must be generally immersed in water after cutting, to avoid oxidation, which will result in browning and dull appearance.
- f) Steaming vegetables conserves the maximum amount of nutrients by subjecting the vegetables to the least amount of heat. Cut your vegetables into small pieces for quicker steaming.

For most frozen vegetables, use ½ cup of water for every 2 cups of vegetables.

**Notable exceptions:** Use 1 cup of water for every 2 cups of beans.

Corn on the cob should be cooked with enough water to cover completely. Vegetable size can significantly shorten or lengthen cooking times. Here are some basic times:

- Spinach -- 3 to 4 minutes
  - Turnip greens -- 15 to 20 minutes
  - Other greens -- 10 to 12 minutes
  - Summer Squash or Zucchini -- 8 to 12 minutes
  - Large beans cut snap beans, broccoli, carrots, cauliflower, corn and peas -- 3 to 10 minutes.
- g) Cook all underground vegetables, or root vegetables, which are grown in dark, in covered pots and pans. Those that are grown in air should be cooked openly. The reason is trapping valuable nutrients and releasing harmful nutrients.
  - h) Short cooking methods reduce loss of nutrients, colour, flavour and texture.
  - i) **Canned vegetables**-There are two basic rules for warming vegetables in cans to help preserve nutrients and maintain appearance:
    1. Never boil canned vegetables.
    2. Raise the temperature to 180 degrees and remove from heat.

To prepare vegetables in cans, drain the liquid into a saucepan and bring it to a boil. Add the vegetables, heat through for about two minutes without boiling, and serve. Here are some other helpful hints:

- Prepare canned vegetables in small batches. Don't overcook vegetables by heating too much at once and letting them sit on a warm stove.
- Avoid excessive stirring of vegetables while warming and prior to serving. Stirring causes the vegetables to break apart and look less attractive.
- Always add vegetables in cans last to dishes that involve combining them with other ingredients during the cooking process. Although there will be exceptions to this advice, the "last in" rule again helps maintain the appearance of the final dish.
- Retain and use the liquid they are packed in to maximize the nutritive value that vegetables in cans provide. Use the juice to cook the vegetables in, or add to soup and stews to enhance flavor.

**Canned vegetables** are ideal for the microwave. Due to the shorter heat exposure time, nutrient losses in canned vegetables are minimized when the microwave is used for heating. The ideal way to heat canned vegetables is to warm the liquid in a microwave-safe dish before adding the vegetables, then heat through.

For a single half-cup serving, one minute to 1- ½ minutes on high setting in the microwave is best. It takes four to five minutes to heat 15 ounces of canned vegetables.

j) **Fresh Vegetables**-One of the best methods of cooking vegetables to conserve maximum food values is to cook them only until tender in just enough water to prevent scorching. Use a pan with a tight-fitting lid. Covering the pan helps prevent the escape of steam and vapor so that vegetables can be cooked quickly in a small amount of water. The amount of water used in cooking vegetables is of major importance in preventing loss of water-soluble nutrients, such as vitamin C, the B vitamins, and some of the minerals. The smaller the amount of water used in cooking, the more food value retained in the cooked vegetable.

So-called "waterless" cooking refers to cooking vegetables with only the water that remains on the vegetables after rinsing and the juice extracted from the vegetables. This method does not permit quick cooking, however, and conserves nutritive values no better than cooking vegetables quickly in a small amount of water.

*Boiling* root and tuber vegetables (carrots, sweet potatoes, potatoes) in their skins retains more vitamins and minerals than cooking these vegetables pared and cut. Tests show that potatoes boiled whole in their skins retain practically all of their vitamin C, thiamine, and other nutrients.

*Baking* potatoes and sweet potatoes whole in their skins conserves the nutritive values of these vegetables well.

*Stir-frying* is a quick way of cooking vegetables in a frying pan with a small amount of oil. This is a good method for conserving the nutrients in succulent vegetables, such as cabbage.

*Steaming under pressure* in a pressure saucepan is a quick and satisfactory method of vegetable cookery-particularly for potatoes, turnips, and carrots-if the cooking period is carefully timed. Prolonged cooking under pressure often results in loss of food value as does holding and reheating vegetables.

*Microwaving* can be used in place of boiling or steaming to cook several vegetables. Cut broccoli into florets and place in a microwaveable bowl with a small amount of water, and salt or butter if desired. Cover and cook on high for 1 1/2 minutes for a 1/2 cup serving.

k) **Frozen Vegetables**-Most frozen vegetable products will have specific instructions for cooking, but here are a few tips to ensure you preserve the quality of the vegetables you are preparing:

- Although vegetables are blanched before freezing, they should be cooked thoroughly before serving in cold food items.
- Use a very small amount of water, usually 1/4 to 1/2 cup - just enough to cover the bottom of the cooking utensil.
- Heat the water first, and then add the vegetables.
- Don't overcook, as this will cause the vegetables to lose nutrients and quality of texture.
- Use only what you need and store the rest, because reheating causes a loss of nutrients.
- As with canned vegetables, maintain appearance by adding last to other dishes and not over stirring.
- Microwaving is best as it helps retain vitamins and fresh flavor.

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## CHEMICAL CHANGES

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- a) Cooking does do is transfer energy from a heat source to the food, so a cooked food becomes more energizing and warming than a raw food. Some nutrients, like beta-carotene, become more bioavailability when food is cooked.
- b) Thiamin and vitamin C are heat sensitive and their content decreases in proportion to cooking time. So vegetables should be added to the pot when the water reaches a rapid boil, and they should be removed as soon as they are cooked. Vitamin A, B2 and Niacin are stable at any temperature.
- c) Carbohydrates in some vegetables such as yam, potato, tubers are gelatinized.
- d) Proteins as the amount is negligible again get gelatinized.
- e) Cellulose is present in the fibers, which on cooking changes to hemicelluloses- which is easily digestible

**Different cuts of vegetables**

- a) **Chiffonade**- very finely sliced or shredded leafy vegetables used as garnish or base for cold food presentation.
- b) **Roundel's**- round, disc shaped cut from cylindrical piece of vegetable.
- c) **Diagonals**- are oval shaped slices or elongated slices cut from cylindrical piece of vegetable
- d) **chopping**- uneven small cuts
- e) **Brunoise**- fine dices- 1/8" x 1/8" x 1/8" or small dice 1/2"
- f) **Mecedoine**- 1/2 cm or 1/4" dices
- g) **Julienne**- very thin strips of 1/8" x 1/8" x 1 1/2"
- h) **Shredding**- thin slices of uneven sized shreds
- i) **Jardinière**- baton shape- 1" x 1/4" x 1/4"
- j) **Batonnet**- 1/4" x 1/4" x 1/4"
- k) **Paysanne**- 1/2" x 1/2" x 1/4"
- l) **Wedges**- tomato or lemon cut into moon shape
- m) **Mirepoix**- rough diced vegetables such as onions, carrots, celery and leeks
- n) **Bretonne**- 1" cubes
- o) **Delmonico**- 3/8" cube
- p) **Chateaux / Turnner**- barrel shaped
- q) **Straw**- 1/10" x 2"
- r) **Pont neuf**- 1" x 1" x 2 1/2"

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**Storage**


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Besides saving nutrients, proper storage and preparation can prevent harmful bacteria from making food unsafe for consumption.

Before handling any food, be sure to wash your hands and clean any utensils or countertops you plan to utilize. Also wash your hands and equipment between handling different foods to prevent cross-contamination. Always use soap.

Rinse all fresh vegetables thoroughly before cooking or eating. If you have any cooked product left over, seal it in a clean container and refrigerate. Leaving food sit out unprotected not only allows the food to spoil more quickly, it also attracts bacteria that will make your cooking and eating area unsanitary.

**Fresh Vegetables**

- a) The length of time raw vegetables are stored, as well as storage temperature and humidity, affects retention of their nutrients.
- b) Vegetables such as spinach, broccoli, and salad greens need to be refrigerated promptly in the vegetable crisper or in moisture-proof bags. They keep their nutrients best at near-freezing temperature and at high humidity
- c) *Cabbage* should not be allowed to dry out. If it is to be held for a few days, wrap it or put it in the vegetable crisper where the humidity is high.
- d) *Green peas and green French beans* hold their nutrients better if left in their pods until ready to use. If shelled, put them into plastic bags before storing in the refrigerator
- e) *Tomatoes* bought or picked before they turn red keep their nutrients best if ripened out of the sun at temperatures from 60 to 75 degrees F. Cover under-ripe tomatoes with a cloth and leave them at room temperature. Do not ripen tomatoes on a hot windowsill or in the refrigerator. Ripe, firm tomatoes, held in the refrigerator or at a cool room temperature for several days, do not lose much vitamin C. When they become overripe, loss of vitamin C increases.

- f) *Carrots, sweet potatoes, potatoes, and other roots and tubers* retain their most important food values reasonably well if kept cool and moist enough to prevent withering.

### **Canned Vegetables**

Vegetables in cans are convenient to store and use. However, extremes in temperature and humidity can affect their shelf life and nutritional quality. Following these basic rules can prevent most problems.

- a) Avoid temperature extremes. Store cans in a cool place where the temperature is between 55 and 70 degrees F (67 degrees F is ideal). Vegetables in cans stored at 85<sup>0</sup>F lose twice as much vitamins content as those stored at 67<sup>0</sup>F.
- b) Low humidity prevents damage to cans. While exterior rust does not affect the contents of cans, its presence indicates that you are storing cans in an area that has too much humidity.
- b) Most vegetables in cans will remain in good shape for two or three years. However, it's best to use them within a year. Use a first in, first out system (FIFO).

### **Frozen Vegetables**

- a) The most important aspect of storing frozen vegetables is to keep them frozen. In order to limit the amount of time frozen vegetables are exposed to warmer temperatures, buy all your frozen foods last when grocery shopping. You may also want to bring a cooler to store frozen foods for the ride home, especially in the hot summer months. When you get home, put away all frozen items first.
- b) Optimal freezer temperatures range from 0 to 20 degrees F. It is better to avoid storing frozen vegetables in self-defrosting freezers, because the thaw cycle destroys the cell structure of the product, thus reducing the quality.
- c) Upon removing the vegetables from the freezer for use, check to see that the packaging has not been punctured or ripped. If the packaging remains intact, the product should remain in good shape for a long time, although 24 months is the rule of thumb.
- d) If you plan to use only part of a package of frozen vegetables, you can safely store the rest and use it later, as long as it is sealed properly. Do not let the unused portion thaw before refreezing, as ice crystals will affect the quality of the product.
- e) Keep in mind that freezing does not kill bacteria; it merely slows down their growth. Therefore, if a product already contains bacteria, they will still be there when it is thawed, regardless of how long it has been frozen. That is why it is important to maintain freezing temperatures and air-tight packaging.
- f) Proper preparation makes a difference.

### **Handling vegetables**

#### **Fresh Vegetables**

##### **Washing**

- Wash all vegetables thoroughly.
- Root vegetables that are not peeled, such as potatoes for baking, should be scrubbed very well with a stiff vegetable brush.
- Wash green, leafy vegetables in several changes of cold water. Lift the greens from the water so the sand can sink to the bottom. Pouring off into a colander dumps the sand back onto the leaves.

- After washing, drain well and refrigerate lightly covered. The purpose of covering is to prevent drying, but covering too tightly cuts off air circulation. This can be a problem if the product is stored more than a day because mold is more likely to grow in a damp, closed space. Use a drain insert in the storage container to allow drainage.

**Soaking**

- With a few exceptions, do not soak vegetables for long periods. Flavor and nutrients leach out.
- Cabbage, broccoli, Brussels sprouts, and cauliflower may be soaked 30 minutes in cold salted water to eliminate insects, if necessary.
- Limp vegetables can be soaked briefly in cold water to restore crispness.
- Dried legumes are soaked for several hours before cooking to replace moisture lost in drying. Dried beans absorb their weight in water.

**Peeling and Cutting**

- Peel most vegetables as thinly as possible. Many nutrients lie just under the skin.
- Cut vegetables into uniform pieces for even cooking.
- Peel and cut vegetables as close to cooking time as possible to prevent drying and loss of vitamins through oxidation.
- For machine paring, sort vegetables for evenness of size to minimize waste.
- Treat vegetables that brown easily (potatoes, eggplant, artichokes, sweet potatoes) with an acid, such as lemon juice, or an antioxidant solution, or hold under water until ready to use (some vitamins and minerals will be lost).
- Save edible trim for soups, stocks, and vegetable purées.

**Check your progress Exercise-1**

Q1. Classify commodities with suitable examples?

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Q2. What is the function of flour in cookery?

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Q3. What are the different cuts of vegetables?

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Q4. What is the importance of ragi in human nutrition?

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### 5.3.4 MUSHROOMS

A mushroom (or toadstool) is the fleshy, spore-bearing fruiting body of a fungus, typically produced above ground on soil or on its food source. The terms "mushroom" and "toadstool" go back centuries and were never precisely defined, nor was there consensus on application. Between 1400 and 1600 AD, the terms mushrom, mushrum, muscheron, mousheroms, mussheron, or musserouns were used.

The term "mushroom" and its variations may have been derived from the French word mousseron in reference to moss (mousse). However, delineation between edible and poisonous fungi is not clear-cut, so a "mushroom" may be edible, poisonous, or unpalatable. Mushrooms are used extensively in cooking, in many cuisines (notably Chinese, Korean, European, and Japanese). Though neither meat nor vegetable, mushrooms are known as the "meat" of the vegetable world. A number of species of mushrooms are poisonous; although some resemble certain edible species, consuming them could be fatal. Eating mushrooms gathered in the wild is risky and should only be undertaken by individuals knowledgeable in mushroom identification. Edible mushrooms are the fleshy and edible fruit bodies of several species of macrofungi (fungi which bear fruiting structures that are large enough to be seen with the naked eye). Most mushrooms sold in supermarkets have been commercially grown on mushroom farms. Of an estimated 1,000 edible mushroom species, only a few dozen have been successfully cultivated. The most popular of these, *Agaricus bisporus*, is considered safe for most people to eat because it is grown in controlled, sterilized environments.

Mushrooms differ from plants in several important ways. The part we eat is only one small portion of the organism, most of which lives invisibly underground as a fine, cottony network of fibers, or hyphae, which ramify through the soil to gather nutrients. A single cubic centimeter of soil - a small fraction of a cubic inch - can contain as much as 2,000 meters/yards of hyphae! When the underground mass of fibers has accumulated enough material and energy, it organizes a new, dense growth of interwoven hyphae into a fruiting body, which it pumps up with water to break above the soil surface and release its offspring spores into the air. The mushrooms that we eat are these fruiting bodies. (Morels form unusual hollow fruiting bodies with a distinctive honeycombed cap; the depressions bear the spores.)

Some common varieties of edible mushrooms include:

1. *Boletus edulis* or edible Boletus- native to Europe, known in Italian as Pig mushroom, in German as Stone mushroom, in Russian as "white mushroom". It also known as the king bolete, and is renowned for its delicious flavor. It is sought after worldwide, and can be found in a variety of culinary dishes.
2. *Cantharellus cibarius* (The chanterelle)- The yellow chanterelle is one of the best and most easily recognizable mushrooms, and can be found in Asia, Europe, North America and Australia.
3. *Cantharellus tubaeformis*, the tube chanterelle or yellow-leg
4. *Grifola frondosa*, known in Japan as maitake (also "hen of the woods" or "sheep's head"); a large, hearty mushroom commonly found on or near stumps and bases of oak trees.



5. *Gyromitra esculenta*, this "False morel" is prized by the Finns. This mushroom is deadly poisonous if eaten raw, but highly regarded when parboiled .
6. *Lactarius deliciosus*, Saffron milk cap, consumed around the world and prized in Russia
7. *Morchella* species, (morel family) morels belong to the ascomycete grouping of fungi. They are usually found in open scrub, woodland or open ground in late spring. When collecting this fungus, care must be taken to distinguish it from the poisonous false morels, including *Gyromitra esculenta*. The Morel must be cooked before eating.
8. *Tricholoma matsutake*, the Matsutake, a mushroom highly prized in Japanese cuisine.
9. *Tuber*, species, (the truffle), Truffles have long eluded the modern techniques of domestication known as trufficulture. Although the field of trufficulture has greatly expanded since its inception in 1808, several species still remain uncultivated. Domesticated truffles include
  - *Tuber borchii*
  - *Tuber brumale*
  - *Tuber indicum*, Chinese black truffle
  - *Tuber macrosporum*, Smooth black truffle
  - *Tuber mesentericum*, The Bagnoli truffle
  - *Tuber aestivum*, Black summer truffle

**Nutrients:** A commonly eaten mushroom is the white mushroom (*Agaricus bisporus*). In 100 grams, these provide 22 calories and are composed of 92% water, 3% carbohydrates, 3% protein and 0.3% fat (table). They contain high levels (20% or more of the Daily Value, DV) of riboflavin, niacin, and pantothenic acid (24–33% DV), with lower moderate content of phosphorus (table). Otherwise, raw white mushrooms generally have low amounts of essential nutrients. Although cooking (by boiling) lowers mushroom water content only 1%, the contents per 100 grams for several nutrients increase appreciably, especially for dietary minerals (table for boiled mushrooms). The content of vitamin D is absent or low unless mushrooms are exposed to sunlight or purposely treated with artificial ultraviolet light.

**Preparing edible mushrooms:** Some wild species are toxic, or at least indigestible, when raw. As a rule all mushroom species should be cooked thoroughly before eating. Many species can be dried and rehydrated by pouring boiling water over the dried mushrooms and letting them steep for approximately 30 minutes. The soaking liquid can be used for cooking as well, provided that any dirt at the bottom of the container is discarded.

The best practice adopted by chefs while cleaning mushrooms is that they are soaked in slurry of flour and water, rubbed gently, so that all the dirt from the body sticks the flour. It is then rinsed in fresh water thoroughly.

**Cooking Mushrooms:** Mushrooms can be cooked in many different ways. Their flavor is generally most developed and intense when they are cooked slowly with dry heat to allow enzymes some time to work before being inactivated, and to cook out some of their abundant water and concentrate the amino acids, sugars, and aromas. Heat also collapses air pockets and consolidates the texture. (The combination of water and air loss means that mushrooms shrink considerably when cooked). Like cellulose, chitin and some other cell-wall materials are not soluble in water, so mushrooms don't get mushy with prolonged cooking. The jelly and ear fungi, which

are popular in Asian cuisines, contain an unusual amount of soluble carbohydrates, and this is why they develop a gelatinous texture. Many mushrooms, and especially their gills, are rich in browning enzymes and blacken rapidly when cut or crushed. The dark pigments are water-soluble and can stain other ingredients in a dish, which may or may not be desirable.

**Storing and Handling Mushrooms:** Refrigeration at 40–45°F/4–6°C will slow mushroom metabolism, but they should be loosely wrapped in moisture-absorbing packaging to avoid having the moisture they exhale wet their surfaces and encourage spoilage. Mushrooms should be used as quickly as possible after purchase. Cookbooks often advise against washing mushrooms so as not to make them soggy or dilute their flavor. However, they're already mostly water, and lose little if any flavor from a brief rinse. They should be cooked immediately, however, since washing can damage the surface cells and cause general discoloration.

**Truffles:** Truffles are the fruiting bodies of species in the genus *Tuber*, of which there are a handful of commercially important ones. (Fig.4B). They're typically a dense, knobby mass, ranging from walnut-to fist-sized or larger. Unlike mushrooms, truffles remain hidden underground. They spread their spores by emitting a scent to attract animals — including beetles, squirrels,

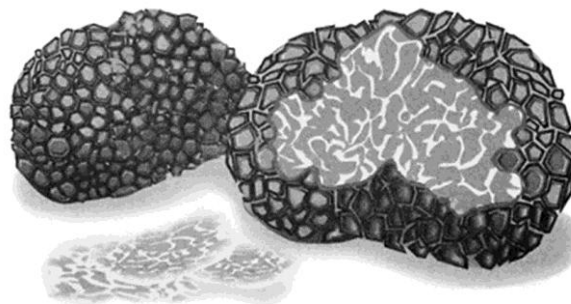


Fig. 4B

rabbits, and deer — which find and eat them and spread the spores in their dung. This is why truffles have a musky, persistent aroma — to attract their spore spreaders — and why they're still gathered with the help of trained dogs or pigs or by spotting truffle “flies,” insects that hover over truffled ground and lay their eggs there so that the larvae can burrow down and feed on the fungus. Truffles grow only in symbiosis with trees, usually oaks, hazels, or lindens, so cultivation means finding or planting a forest, with significant harvests coming only after a decade or more. The Périgord region in France remains renowned for its black winter truffles, *Tuber melanosporum*, and northern and central Italy for its white truffle, *Tuber magnatum Pico*. Both are in great demand, in limited supply, and so quite expensive. Their flavor can be bought more reasonably in the form of cooked whole truffles or truffle paste, or truffle-infused oils, butter, and flours, though some of these may be flavored artificially. There are a number of other truffle species harvested in Europe, Asia, and North America, but they're not as flavorful. Unripe truffles of any species will have little flavor. The flavors of black and white truffles are quite distinct. Black truffles are relatively subtle and earthy, with a mix of a dozen or so alcohols and aldehydes, and some dimethyl sulfide. White truffles have a stronger, pungent, somewhat garlicky aroma thanks to a number of unusual sulfur compounds. The flavor of black truffles is generally thought to be enhanced by gentle cooking, while the flavor of white truffles, though strong, is fragile, and best enjoyed by shaving paper-thin slices onto a dish just before serving. Such cross sections of truffle reveal its inner structure: a network of fine veins running between masses of spore-bearing cells. Fresh truffles are very perishable and emit their aroma in storage. They're best kept refrigerated in a closed container with some material - often rice - to absorb moisture and keep their surface from getting wet and spoiled by microbes.

### 5.3.5 FRUITS

"Fruit" normally means the fleshy seed-associated structures of a plant that are sweet or sour, and edible in the raw state, such as apples, bananas, grapes, lemons, oranges, and strawberries. (Fig.4C)

Fruits may be classified into 7 categories:

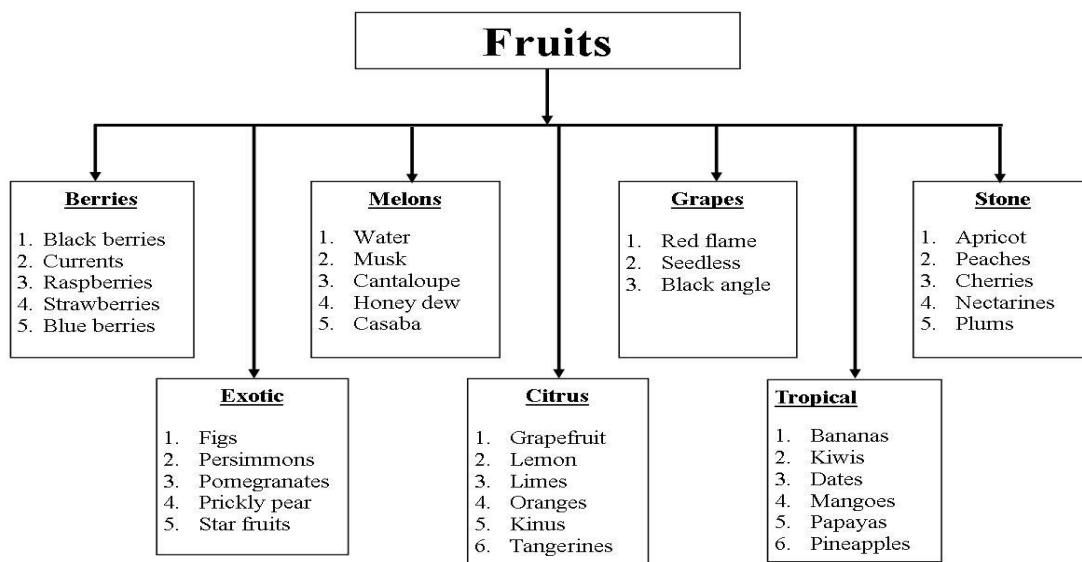


Fig. 4C

#### Uses of Fruits: -

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

**Purchasing of vegetables and fruits:** In general, many fresh commodities must necessarily be shipped in firm condition, such as pears, tomatoes, cauliflower, avocados and tomatoes. Better retailers are conditioning these products to just the stage of ripeness the consumer likes - by the time they arrive at the point of sale. Check the characteristic signs of freshness such as bright, lively color and crispness. Vegetables are usually at their best quality and price at the peak of their season.

Buy mature fruit. A green peach or nectarine, for example, will not ripen but merely soften some and wither. A cantaloupe picked too green will soften but will not be sweet and juicy. Some commodities do not gain sugar after harvest, because they have no reserve starch for conversion to sugar. On the other hand, bananas and pears gain sugar as well as tenderness after harvest.

Handle with care. Fresh fruits and vegetables, because of their perishability, require constant attention to keep their fresh appearance. The less you handle them when purchasing, or in the home, the longer their life. Don't pinch, squeeze or poke them., for bruising leads to damage and damage results in more spoilage for you or your retailer.

Use thoughtful care to prevent injury to vegetables. Some vegetables are more hardy than others, but bruising and damage can be prevented by just being careful. The consumer pays for carelessness in the long run.

Don't buy because of low price alone. It doesn't pay to buy more vegetables than you can properly store in your refrigerator or use without waste. Most fresh vegetables can be stored for 2 to 5 days, except for root vegetables, which can be stored from 1 to several weeks.

Avoid decay. It's a waste of money to buy fresh vegetables affected by decay. Even if you do trim off the decayed area, rapid deterioration is likely to spread to the salvaged area. Paying a few cents extra for vegetables in good condition is a good investment.

Some vegetables are labeled with a FPA quality grade. The quality of most fresh vegetables can be judged reasonably well by their external appearance. Therefore, consumers can usually make a good selection of vegetables from retail display counters even without the help of a grade mark or other identification of quality. Vegetables are available year-round from both domestic production and imports from other countries.

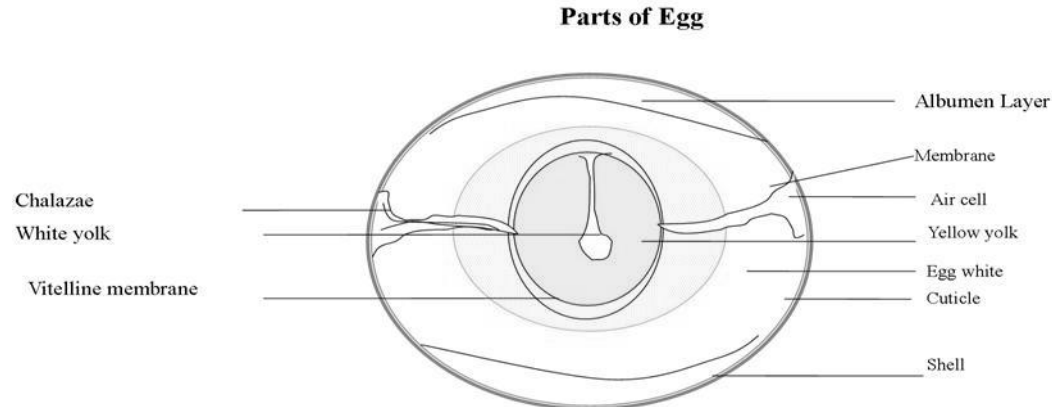
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#### 4.3.6 EGGS

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The egg is a biological structure intended by nature for reproduction. It protects and provides a complete diet for the developing embryo, and serves as the principal source of food for the first few days of the chick's life. The egg is also one of the most nutritious and versatile of human foods.

The term egg not only applies to those of the hen, but also to the edible eggs of other birds such as turkey, geese, ducks, plover and gulls. But in hotel industry we are more concerned with hens egg.(Fig.4D)



**Fig. 4 D**

**Essential nutrients:** Eggs are especially valuable as a source of protein. In fact, egg protein is used as the standard against which the quality of other food proteins is measured. One egg contains about 6 to 7 grams of protein. People of all ages need adequate protein for building and repairing body tissues.

The fat in the yolk is so finely emulsified that it is digested easily, even by infants. The ratio of unsaturated to saturated fats is about 2 to 1. This is considered very desirable. Oleic acid is the main unsaturated fat. It has no effect on blood cholesterol. Eggs contain vitamin A, the B vitamins (thiamin, riboflavin, and niacin), and vitamin D. All are necessary during childhood and adolescence for growth. Eggs also contain an abundant supply of minerals, such as iron and phosphorus, which are essential for building and maintaining strong, healthy bodies. But eggs are low in calcium (it is in the shell), and contain little or no vitamin C.

Hens egg are graded into four sizes

- Peewee                1 oz
- Small                 1 oz
- Medium               1 oz
- Standard             2 oz
- Large                 2 oz
- Jumbo                 3 oz

The size of an egg does not affect the quality but does affect the price. Good eggs are available throughout the year but the best during the winter season.

**Characteristics of egg:** Eggs are a very versatile food. They can be used as a main dish or as an ingredient in more complex dishes. Eggs provide a wide variety of attributes for the finished dish. In addition to adding color and flavor, eggs provide the following characteristics to dishes:

<b>Thickening</b>	Eggs thicken foods like custards puddings, sauces, and creamy fillings.
<b>Leavening</b>	Soufflés, sponge & butter cakes, quick breads, and puffy omelets are leavened by eggs.
<b>Coating</b>	Meat dishes, breads, and cookies are some foods with egg components as the base ingredients for coatings.
<b>Binding</b>	Eggs bind other ingredients for making meat loaves, casseroles, and croquettes.
<b>Emulsifying</b>	Eggs prevent mixture separation in mayonnaise, salad dressing, and cream puff filling.
<b>Clarifying</b>	Tiny particles are coagulated in soups and coffee to create a clear solution.
<b>Retarding</b>	Crystallization of sugar is slowed in cake icings and candies.
<b>Crystallization</b>	

**Uses of eggs:-**

1. As Horsd'oeuvres (egg mayonnaise)
2. As salads (fish salads, Russian salad)
3. As main course (egg Florentine, egg curry, scrambled eggs)
4. As garnish (chicken biriyani, Salads)
5. Sauces (mayonnaise, hollandaise)
6. Custard (caramel custard)
7. Soufflé (pineapple soufflé)
8. Crepes (pastas, noodles, pancakes)
9. Thickening agents (soups, puddings)
10. Emulsifying agent (mayonnaise)
11. Pastries(sponges)
12. Leavening agent (soufflé, cakes, meringue)
13. Clarifying agent (consommé)
14. Flavoring agent (custards)
15. Enriching agent (Bombay duck)
16. Glazing agent (patties, buns, rolls)
17. Coloring improvers (buns, custards, cakes)
18. Binding agent (croquettes, puddings)
19. Interfering agent (ice creams)
20. As sorbets (mock tails)

**Purchasing quality of good eggs:**

1. Colour - could be either brown or white but does not affect the quality of eggs.
2. Size and weight - Average weight of an egg is about 52-55 gm and the weight of each egg is proportional to its size.
3. Egg Yolk Upstanding, well-rounded and of a good even color indicates freshness. The red spot on the yolk indicates that the egg is fertilized and it is prominent only when it is hatching.
4. Shell- Any cracks on the shell indicates deterioration of quality of he eggs. The shell should be clean, well shaped, strong and slightly rough.
5. Purchase only the amount needed for 1 2 weeks
6. Buy farm fresh or refrigerated eggs.
7. Inspect carefully and discard any chipped ones.

**Test for freshness:**

**1. Buouncy method-** dip an egg in a glass of water, If it floats on top, it is fresh and if it sinks in the bottom, it is stale. In any stale egg, thick white gradually changes into thin white and the water passes from the white into the yolk. The yolk loses strength and begins to flatten resulting in evaporation of water and replacement of air inside. This causes the egg to float on the water. (Fig.4E)

**2. Candling-** When fresh eggs are held to the strong light, they have a uniform rosy tint and the yolk is firmly suspended in the center. The look more transparent on top. Stale eggs look cloudy and opaque and the yolk settles against the shell. Eggs having dark spots on the shell are definitely bad.(Fig.4F)

**Coagulation of eggs depends on:**

- Intensity of heat more heat leads to faster coagulation.
- Heating time - more heating time leads to more coagulation.
- Presence of sugar and salt in the liquid salt aids in coagulation by lowering the coagulation temperature, where as sugar increases coagulation temperature and helps in forming a firmer gel.

**Fig.4F****4.3.7 FOUNDATION INGREDIENTS**

Foundation ingredients are regarded as the basic ingredients needed for preparation of a particular dish. These ingredients form the backbone of the shape, quality, flavour, texture and taste of that particular dish. Foundation ingredients can be liquid or solid or in powdery form. A clever chef should have adequate knowledge about the characteristics of these ingredients so that he can prepare numerous of dishes by permutation and combination methods.

**4.3.7.1 SALT**

These are chemical compound (other than water) formed by a chemical reaction between an acid and a base. Salt for human consumption is produced in different form

sun refined salt (such as sea salt), refined salt (table salt), and iodized salt. It is a crystalline solid, white, pale pink or light gray in color, normally obtained from sea water or rock deposits. Edible rock salts may be slightly grayish in color because of mineral content.

Classification of salt:

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

Uses of salt:

1. Acts as preservative, as it acts on microorganisms, extracts the liquid from them and then kills them.
2. Acts as anti-raising agent- regulates the leavening processes in breads by controlling the action of yeast.
3. Acts as tenderizers- it breaks the cells and tissues of the flesh and makes it more tender to be cooked easily
4. Acts as taste enhancer
5. Preparation of brine solution for curing of meat, fish and poultry.
6. Solution of salt is applied inner walls of tandoor to give it more friction, shine and stability.
7. Helps to absorb food in intestine
8. Salt helps in increasing the body resistance towards any type of illness and disease.
9. Helps in regulation water content in the body.

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**4.3.7.2 SPICES, DRIED HERBS AND CONDIMENTS**

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- **Spices** come from the bark (cinnamon), root (ginger, onion, garlic), buds (cloves, saffron), seeds (yellow mustard, poppy, sesame), berry (black pepper), or the fruit (allspice, paprika) of tropical plants and trees.
- **Herbs** are leaves of low-growing shrubs. Examples are parsley, chives, marjoram, thyme, basil, caraway, dill, oregano, rosemary, savory, sage and celery leaves. These can be used fresh or dried. Dried forms may be whole, crushed or ground
- **Condiments** are usually a combination of herbs and spices blended in a liquid form. Examples are prepared mustard, catsup, Worcestershire sauce, tabasco sauce, and many of the steak sauces and specialty vinegars. Many of these contain sodium.

Spices tend to be associated with cooking to enrich and give a distinctive depth of colour and flavour to food. Different spices like basic spices including powder spices and whole spices are often used together to wonderful flavours to certain styles of cooking. Spices add a whole new dimension to cooking. Each of these spices has its own distinctive colour and flavour. Spices are high in flavour yet low in fat, calories and sodium.

Spices are consistent in flavour and have a much longer shelf- life. They are easier to store and are not affected by bacterial contamination. They can be blended and used as per individual choices. They release their flavour fully on cooking or adding to the food and retain their flavour for a long time. It is said that some spices have antioxidant potential equal to fresh produce and can further reduce the risk of developing heart disease and certain cancers. Even leading dieticians agree that spices must be included in one's diet to enhance the flavour of food and make it more interesting and may provide long-term health benefits. They can be conveniently added to day to day cooking, are inexpensive, are readily available and always in season, and by their essence, highly palatable and easily consumed".

**Ways to add spices to Food for maximum flavor:**

- Use spices and herbs to improve the natural aroma of the food, do not mask the flavor.
- Crush dry herbs just before adding these to the food. This gives a better flavor. Fresh herbs must be added at the end of the cooking for maximum aroma.
- Do not use two strong flavoured herbs together. Always use one strong flavoured and one herb or spice with mild flavor.
- While removing spices or herbs from the container use a dry spoon.
- To get a blended flavor add herbs at the beginning of the cooking. But if you want a distinctive flavor then add herbs at the end of cooking.
- Whole spices are best to use in dishes that take long to cook as these discharge the flavor slowly.
- Ground herbs and spices give out flavor very easily and fast. In dishes that take long to cook like curries and stew, add ground spices towards the end of the cooking.
- Foods that are not cooked or cold dishes like salads, fruits and juices, add spices and herbs many hours before the food is served to allow the flavour to blend well with the food.



- While following a recipe, if you increase the quantity two times do not use double the amount of spices, add only 50% more.

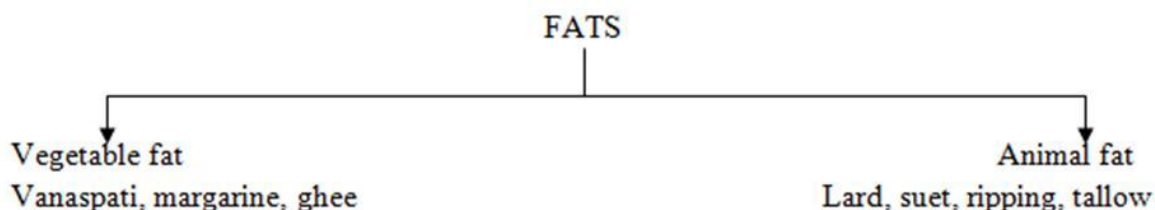
### 4.3.7.3 FATS AND OILS

The term 'Fat' includes all the edible oils and solid fats extracted from plants and animal sources that are used in food preparation. Chemically they are glycerin of fatty acids.

#### Characteristics:

- They are the most important source of energy. One gram fat gives 9 Kcals of energy.
- Oils and fat fulfill the same function. All the fats that remain liquid at room temperature (18 – 24<sup>0</sup>C) and have higher melting point with the exception of coconut oil, which is liquid in summer and solidifies in winter, are termed 'oils'. Oils have lower melting point.
- All fats contain the same calorific value but some natural fats contain other nutrients mixed with them.
- Fats contain higher % of saturated fatty acids where oils contain more unsaturated fatty acids.
- They are insoluble in water, but soluble in certain chemicals like chloroform, ether etc.

#### Classification of fats: (Fig.4G)



**Fig. 4G**

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

#### Nutritive value:

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

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

#### ANIMAL FAT

Name	Description	Uses
Lard	It is the inside fat of pig. Lard has almost 100% fat content.	Short paste, deep-frying, and shallow frying.

<b>Suet</b>	This is the hard solid deposit near the or around the kidney oof the animals. Beef suet is best than mutton suet. Fresh suet is firm, dry without any discoloration and blood strains.	Suet paste and also for frying purpose.
<b>Ripping</b>	This is obtained from classified animal fat.	Frying
<b>Butter</b>	Made by churning cream of milk.	Frying, sautéing, spread on breads.
<b>Ghee</b>	Made by clarifying butter	Frying, sautéing

### VEGETABLEL FAT

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

### DIFFERENT TYPES OF OILS

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

#### Changes in Fats and Oils on heating:

Fats and oils give a rich flavor and texture to food and make it crispy. It also increases the energy value of food. The fats and oils should not be heated to smoking point, as it starts decomposing with emission of blue smoke which is irritating and the vitamins are lost, and not good for health. If the fat is not heated properly, the food absorbs a

lot of fat and becomes greasy. Less fat is absorbed during frying if high smoking fat is used.

**Changes of Fats and Oils when exposed to air:**

Fats and oils when exposed to air for a long time undergoes chemical changes with foul smell and undesirable flavour. This is called rancidity. This is result of Hydrolysis and oxidation. Rancidification can also detract from the nutritional value of food, and some vitamins are highly sensitive to degradation.

**Selection of Fats and Oils:**

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

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**4.3.7.4 SUGAR**

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

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

1. The source (sugarcane or sugar beet)
2. The country of origin
3. The method of processing, which in turn determine the type of sugar produced, e.g. cube sugar, icing sugar.
4. Catering use – specific type of sugar should purchase for particular use.

Chemical group - sugar may be classified in two chemical groups, mono and disaccharides.

**Manufacture of sugar**

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

**Forms of Sugar:**

1. *Turbinado sugar*- also called Demirara sugar. It is partially refined, light in color with coarse grain and caramel flavor. It is used in beverages and certain baked products.

2. **Lump sugar**- obtained by molding moist granulated sugar while hot. Used in restaurant and coffee shops.
3. **Sugar loaf**- sugar molded into cone shape.
4. **Icing sugar**- also known as confectioner's sugar. It is very fine sugar mixed with 3% starch powder (corn flour). Used in dusting, decorating, icing cakes and pastries.
5. **Castor sugar**- This is superfine sugar (A Grade) - made by crushing and sieving fine granulated quality granulated sugar. Used in making pastries, cakes, desserts, ices etc. It quickly dissolves in liquids and produces light and tender cakes.
6. **Granulated/ white sugar** - It is related as fine, the type most commonly sold or as ultra fine for the use in cake making or instant food product. It contains 99.7% sucrose
7. **Powder Sugar**- It is obtained from granulated sugar by pulverization (refining of granulated sugar to get more fine form). It is available in various degree of fineness, use for different purposes in confectionary.
8. **Brown Sugar**- It is simple refined sugar with some molasses returned to it. It is brown in color and has distinctive color and flavor. As it contains moisture , it forms lumps . Used in the preparation of certain puddings, cakes, etc.
9. **Sugar nibs**- Rounded grained sugar obtained by crushing blocks of white sugar – used in confectionary.
10. **Invert sugar**- Sugar obtained by the action of acids and enzymes (invertase on sucrose) – used in pastry.
11. **Candy sugar**- very large crystals of white sugar.
12. **Vergeoise sugar**- solid residue from refining beet or cane sugar giving a product of soft consistency, golden or brown with pronounced color.
13. **Glucose**- It is present in body and in fruits in natural form. Commercially it is sold as Dextrose. It is less sweet than sucrose, but it is use because of its waster holding capacity. It has ability to control the size of the crystals in candies and as a food for yeast, during the fermentation.
14. **Fondant**- sugar syrup beaten with cream of tartar to form thick white paste. Used for decorating pastry or confectionary.
15. **Liquid caramel**- liquid sugar.
16. **Pastillages**- Icing sugar mixed with gelatin, starch or gum. Used in decoration.
17. **Treacle/Molasses**- are products of refined sugar. Used in the preparation of sugar.
18. **Maltose**- It is use as a flavoring and coloring agent in the brewing of beer.
19. **Lactose**- It is commercially extracted solution of whey formed by crystallization. It is usually added to bakery products because its presence adds to the brewing of food products.
20. **Syrups**- These are liquids containing large amount of sugar. These are usually used to add flavour to the food products.
21. **Honey**-It is natural sugar consisting of glucose and fructose. It is used as leavening agents and in sherbets.
22. **Corn Syrup**-consists of glucose or dextrose. It is prepared by converting corn starch into simple sugar compound by the use of enzymes. Used in icing and candy masking.
23. **Malt syrup**- obtained by distillation of barley. Used in breads.

**Uses of Sugar:**

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

*NOTE :* "Rum is a form of sugar."

**Cooking of sugar:**

Sl. No.	Consistency	Temperature	Uses	Texture
1.	<b>Coated</b>	100 <sup>0</sup> C	For fruits in syrup	Translucent coating
2.	<b>Small thread</b>	101 <sup>0</sup> C	In almond paste	2-3 cm thread
3.	<b>Large thread</b>	102-103 <sup>0</sup> C	Butter cream, icing	.5 cm thread
4.	<b>Small pearl</b>	103-105 <sup>0</sup> C	Jams	Rounded bubbles
5.	<b>Large pearl</b>	107-109 <sup>0</sup> C	Jams, glaces, icings	Bubbles with 2 cm threads
6.	<b>Soft ball</b>	116-118 <sup>0</sup> C	Jam, jelly, nougat	Soft ball
7.	<b>Hard ball</b>	121-125 <sup>0</sup> C	Fondant, meringue	Harder ball
8.	<b>Soft crack</b>	129-135 <sup>0</sup> C	Toffee	Hard, sticky ball
9.	<b>Hard crack</b>	149-150 <sup>0</sup> C	Candies, decoration	Brittle, not sticky
10.	<b>Light caramel</b>	151-160 <sup>0</sup> C	Puddings, cakes, biscuits	
11.	<b>Dark caramel</b>	161-170 <sup>0</sup> C	Cakes, sauces, stocks	

**Procedure for cooking:** Add some interferents (which prevent re-crystallization) like lemon juice, cream of tartar, vinegar etc.

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

**4.3.7.5 TEA**

Tea is the agricultural product of the leaves, leaf buds, and internodes of the *Camellia sinensis* plant, prepared and cured by various methods. Tea also refers to the aromatic beverage prepared from the cured leaves by combination with hot or boiling water. After water, tea is the most widely consumed beverage in the world. It has a cooling, slightly bitter, astringent flavour which many enjoy.

**Composition of tea:**

1. Caffeine- has refreshing quality , acts as stimulant
2. Tannins- tannic acids give astringent flavour to the tea which has a binding effect of tea and milk. It gives colour. Bitter taste in tea is due to tannins.
3. Aromatic oils- present in small quantity, but enhance the flavour.

**Classification:**

Tea is traditionally classified into six varieties based on the techniques with which it is produced and processed. They are:

1. White tea: Wilted and unoxidized, the leaves are picked and harvested before the leaves open fully, when the buds are still covered by fine white hair. Hence the name. White tea is scarcer than the other traditional teas, and quite a bit more expensive.
2. Yellow tea: Unwilted and unoxidized but allowed to yellow, have mellow taste.
3. Green tea: Unwilted and unoxidized, have a distinctive 'grassy' taste.
4. Oolong: Wilted, bruised, and partially oxidized.
5. Black tea: Wilted, sometimes crushed, and fully oxidized and fermented during processing, to give them their distinctive flavours. Black tea has a full, rich taste.
6. Post-fermented tea: Green Tea that has been allowed to ferment/compost e.g pu-erh

**Grading of tea:** After processing the leaves are graded. There are 3 grades:

1. Leaf grade- larger leaves from which flavour and colour comes out slowly, but if brewed longer, they produce strong flavoured liquor. It is of three types:
  - a) Orange Pekoe- long, thin, wiry leaves sometimes contain yellow tips or bud leaf. Liquor is light or pale in colour.
  - b) Peco- short leaves, not as wiry as Orange Pekoe, the buds are not taken in this grade. The liquor has more colour and brewing is quicker than Orange Peco
  - c) Souchong- a bold and round leaf with pale liquors.
2. Broken grade-these are smaller and broken leaves and are usually 80% of the total yield. The broken grades quickly brew and give darker and stronger liquor.
  - a) Broken orange pekoe- small leaves containing yellow tips, good colour and strength and used in blending
  - b) Broken pekoe- Little larger and bolder the broken orange pekoe, lighter colour liquor formed.
  - c) Fannings- much smaller the above ones, quick brewing and good colour liquor is formed.
3. Dust- the smallest particles of the tea leaves are graded as dust. They are cheaper, provide colour, but lack in flavour.

**Storage of tea:** Tea has a shelf life that varies with storage conditions and type of tea. Black tea has a longer shelf life than green tea. An exception, Pu-erh tea improves with age. Tea stays freshest when stored in a dry, cool, dark place in an air-tight container. Black tea stored in a bag inside a sealed opaque canister may keep for two years. Green tea loses its freshness more quickly, usually in less than a year. Storage life for all teas can be extended by using desiccant packets or oxygen absorbing packets, and by vacuum sealing.

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#### 4.3.7.6 COFFEE

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Coffee is a brewed beverage prepared from roasted seeds, commonly called coffee beans, of the coffee plant. Due to its caffeine content, coffee often has a stimulating effect on humans. Today, coffee is one of the most popular beverages worldwide. Coffee berries, which contain the coffee seed, or bean, are produced by several species of small evergreen bush of the genus *Coffea*. The two most commonly grown are the highly regarded *Coffea arabica*, and the '*Coffea robusta*'. Once ripe, coffee berries are

picked, processed, and dried. The seeds are then roasted to varying degrees, depending on the desired flavor. They are then ground and brewed to create coffee. Coffee can be prepared and presented in a variety of ways.

Components of coffee:

1. Caffeine- a stimulating agent having refreshing quality
2. Essential oil- caffeol, which gives flavour
3. Nutrients-sodium, potassium, magnesium, phosphorus

**Storage:** Once roasted, coffee beans must be stored properly to preserve the fresh taste of the bean. Ideally, the container must be airtight and kept in a cool, dry dark place. In order of importance, air, moisture, heat, and light are the environmental factors responsible for deteriorating flavor in coffee beans.

Folded-over bags, a common way consumers often purchase coffee, are generally not ideal for long-term storage because they allow air to enter. A better package contains a one-way valve, which prevents air from entering.

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#### 4.3.7.7 MILK

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Milk may be defined as the whole fresh lacteal secretion obtained by the complete milking of healthy animals excluding that from the animals that are within 15 days or after 15 days of calving. It is also processed into dairy products such as Cream (food)cream, butter, yogurt, ice-cream, gelato, cheese, casein, whey protein, lactose, condensed milk, powdered milk, and many other food-additive and industrial products. Other than cows and buffalo, milk can also be obtained from sheep, goats, horses, donkeys, camels, yaks, water buffalo and reindeer. The other forms of milk are-The white juice and the processed meat of the coconut in more-or-less liquid form, used especially in Thai, Indian, and Polynesian cuisine. A non-animal substitute such as rice, soy milk etc. are also used.

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

- a) Rancid (also called on the turn. Milk is still consumable at this stage)
- b) Curdling (separation of curd and whey will occur but may still be consumable)
- c) Coagulation (beyond use. A period of aromatic decay sets in accompanied by mould)
- d) Dry (beyond use. The milk has dehydrated and become hard and chalky)

#### Different types of milk production and milk products

**1. Pasteurized milk:** By this method the bacteria is killed and their action of sour producing is retarded. Pasteurization is done by two ways:

- a) Flash process-In this milk is heated to 71.1°C (161° F) and then subsequently held for 15 seconds and then it is rapidly cooled below 48°C (50° F).
- b) Hold process-In this the milk is heated to 63-65°C (145-150° F) and then maintain this temperature for 3minutes and then cooled down immediately to 48°C (50°F)

**2. Homogenized milk:** In this milk and cream are mixed together briskly so that they do not separate when stand. This is done by subjecting the milk high pressure (200lb) per sq. inch through a small apparatus so that the fat globules are reduced in size and increase in number, which results in easy mixture and the fats do not rise above to the surface.

**3. Sterilized milk:** This is homogenized milk in which the milk is heated to 104-110<sup>0</sup>C for 30-40 minute in sealed bottle or cans, which kills the souring and disease bearing bacteria. It has a different taste from fresh milk and the shelf life of this type of milk is 2-3 months in sealed conditions.

**4. Ultra- heat treatment milk:** In this the milk is treated to ultra-heat treatment that is 132<sup>0</sup>C for 1 second under sterile conditions. Shelf life is of 2-3 months.

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

**6. Dried milk:** Can be produced either by:-

- a) **Roller Drying** The evaporated milk is run on to hot rollers which cause the removal of remaining moisture by further evaporation the solid milk which sticks to the roller in scraped off the roller. The temperature and the rate of rotation of the steel heated drums are controlled so that the milk is dried in less than a complete rotation.
- b) **Spray Drying** By this the milk is evaporated, to reduce the bulk, then it is forced through a fine spray into a hot chamber and here in the hot chamber the remaining water is removed. The temperature ranges from 38<sup>0</sup>F to 400<sup>0</sup>F. It is desirable to cool down the fired. Powder as quickly as possible in a separate cool room, because the prolonged temperature will deteriorate and discolour the product.

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

#### **MILK PRODUCTS:**

- a) Cream
- b) Yoghurt and fermented milk(cultured milk- sharp taste, 5% fat and Smetana-cultured milk containing 10% fat)
- c) Cheese
- d) Paneer
- e) Butter
- f) Khoya

#### **Storage of milk:**

- As milk gets curdled, it should not be kept standing for not more than approx. 1 hour.
- Keep milk in refrigerated conditions
- As milk absorbs odor from other items easily and gets contaminated, so extreme precautions are taken. Milk should be always be kept covered.



- Frozen milk should be thawed first and then boiled
- Always boil the milk, cool and then refrigerate. Boiling kills all the harmful micro-organisms.
- The storing container should be fresh without any swills or odor.
- Self live in refrigerator in frozen condition is approx 4-5 days.
- Tinned milk should be stored in cool, dry place.

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#### 4.3.7.8 COCOA

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Cocoa is the dried and fully fermented fatty seed of the cacao tree (*Theobroma cacao*), from which cocoa solids and cocoa butter are extracted. They are the basis of chocolate.

**Classification of Cocoa:** Cocoa can be classified into 4 types:

1. *Forastero*, which now forms the greater part of all cocoa grown, is hardy and vigorous producing beans with the strongest flavour.
2. *Amelonado* is the Forastero variety most widely grown in West Africa and Brazil. It has a smooth yellow pod with 3 or more pale to deep purple beans.
3. *Crillo* with its mild chocolate flavour is grown in Indonesia, Central and South America. Crillo trees are not as hardy and they produce softer pods which are red in colour, containing 20-30 white, ivory or very pale purple beans.
4. *Trinitario* plants are not found in the wild as they are cultivated hybrids of the other two types. Trinitario cocoa trees are grown mainly in the Caribbean area but also in Cameroon and Papua New Guinea. The mostly hard pods are variable in colour and they contain 3 or more beans of variable colour but white beans are rare.

**Types of Cocoa powders:** There are two types of cocoa powder a) natural (non - alkalized) and b) Dutch process (alkalized).

- a) **Dutch** - process cocoa has been treated with a chemical, such as potassium carbonate, to reduce the natural acidity of the cocoa beans. Dutching also darkens the cocoa to an appetizing rich, deep reddish - brown color; extreme Dutching results in the distinctively flavored charcoal - black cocoa used to make Oreo cookies. Dutch - process cocoa may or may not be labeled as such, but cocoa processed with alkali should appear on the ingredient statement.
- b) **Natural** cocoa is typically labeled cocoa.- Generally, higher fat content improves the flavor and quality of cocoa. Natural cocoas contain 10 to 12 percent fat, although superior - quality, high - fat natural cocoa is available with 22 to 24 percent fat. The flavour is fruitier and mellow.

**Chocolate production:** Chocolate is a range of products derived from cocoa(cacao), mixed with fat (i.e. cocoa butter and/or plant oils) and finely powdered sugar to produce a solid confection. There are several types according to the proportion of cocoa used in a particular formulation. To make 1 kg (2.2 pounds) of chocolate, about 30 to 60 beans are processed, depending on the desired cocoa content. The beans are roasted and then ground into a thick creamy paste, known as chocolate liquor or cocoa paste. This liquor is then further processed into chocolate by mixing in (more) cocoa butter and sugar (and sometimes vanilla and lecithin as an emulsifier), and then refined, conched and tempered. Alternatively, it can be separated into cocoa powder and cocoa butter using a hydraulic press or the *Broma* process. This process produces around 50% cocoa butter and 50% cocoa powder. Standard cocoa powder has a fat content of approximately 10-12 percent. Cocoa butter is used in chocolate bar

manufacture, other confectionery, soaps, and cosmetics.

### Types of chocolate:

- a) **Semi-Sweet Chocolate** - Made from unsweetened chocolate (chocolate liquor), but with the addition of sugar, cocoa butter, lecithin and vanilla mixed in. Semi-sweet chocolate must contain at least 35% unsweetened chocolate, and typically is less than 50%.
- b) **Dark Chocolate** - The rules regarding classification of chocolate in this category vary throughout the world. However, the one constant is that this type of chocolate contains no milk solids, but has sweeteners and cocoa butter added to the mix. In Europe, dark chocolate must consist of at least 35% cocoa solids while in the U.S., it must have a 15% concentration of chocolate liquor.
- c) **Milk Chocolate** - Like you'd guess from the name, milk chocolate is made with condensed or powdered milk. In Europe, milk chocolate must consist of at least 25% cocoa solids, while in the US, it must have 10% concentration of chocolate liqueur and a minimum of 12% milk solids. Milk chocolate is primarily used for eating and is the most popular form of chocolate in the U.S.
- d) **White Chocolate** - The name given to white chocolate is a misnomer because it isn't really chocolate at all. Strictly speaking, chocolate is defined as any product 100% based on cocoa solid. White chocolate doesn't contain any cocoa solids and is made from cocoa butter, milk solids and sugar.
- e) **Couverture Chocolate** - Chocolates under this classification are true gourmet chocolates that are rich in cocoa butter (upwards of 35%) which creates an extremely high fat content. Cocoa butter is the fat extracted from chocolate liquor. These chocolates contain a very high percentage of cocoa which is the solid powder left after the cocoa butter is extracted from the chocolate liquor.

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### 4.3.7.9 RAISING AGENTS

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A raising agent or leavening (sometimes called just leavening or leaven) is a substance used in Dough doughs and batters that causes them to rise. In the presence of moisture, heat, acidity, or other triggers the leavening agent reacts to produce gas (often carbon dioxide) that becomes trapped as bubbles within the dough. When a dough or batter is baked, it sets and the holes left by the gas bubbles remain. This is what gives breads, cakes, and other baked goods their soft, sponge-like textures.

There are 3 types of raising agents:

**A) Chemical Leavening (Raising) Agents-** Chemical leaveners are chemical mixtures or compounds that typically release carbon dioxide when they react with moisture, heat, and acidity. They usually leave behind a chemical salt. Chemical leaveners are used in quick breads and cakes. Chemical agents include:

1. Baking Powder (Sodium Bicarbonate + citric acid +corn flour)
2. Baking soda (Sodium Bicarbonate)
3. Ammonium Bicarbonate (Hartshorn, Horn Salt, Bakers Ammonia)
4. Potassium Bicarbonate (Potash or pearl ash)
5. Monocalcium phosphate

**B) Biological Leavening (Raising) Agents-** Microorganisms that release carbon dioxide as part of their lifecycle can be used to leaven products. Varieties of yeast are most often used. Yeast leaves behind waste byproducts that contribute to the distinctive flavor of yeast breads. Some other typical biological leaveners are: Beer (Unpasteurised - Live Yeast), buttermilk, Ginger Beer, Kefir, Sourdough Starter and Yogurt

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#### 4.3.7.10 THICKENING AGENTS

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A thickener is an ingredient or agent that can be added to other food ingredients in order to change the viscosity to create a stiffer or a more dense food mixture. Also referred to as a liaison, some thickeners assist to disperse solids within a mixture, thus increasing the viscosity and making the substance less fluid.

**Classification:**

Thickening agents can be classified into:

**1. NATURAL THICKNERS-**

1. **Agar** - A form of seaweed that has been dried to be used as a thickener in food. Traditionally used in Asia, it can be substituted for gelatin. It actually sets stronger than gelatin and does not require refrigeration to set up, so not as much of it is needed to achieve the required effect. It is often used in commercially produced ice cream as a thickener. It is also known as agar-agar, kanten and Japanese gelatin.
2. **Arrowroot** - a starch thickener, very similar to cornstarch, which is most often used for sauces and gravies. One of the key attributes of this thickener is its ability to withstand extended periods of heating without breaking.
3. **Blood** - a traditional thickener used more during earlier years of food preparation than during the current era. Blood is not easily available or desired by consumers, so it is not often used. Since some states and regions make it illegal to use the substance, it is restricted for use in many areas.
4. **Butter** - a common thickener for a variety of sauces, often being added as a finishing agent for the sauce. It may be added to sauces as an emulsion, becoming a flavor enhancer and thickening agent for hot liquids, such as monter au beurre sauce, or it can be simply added to smooth and soften the texture and flavor of a sauce.
5. **Cornstarch** - A flour-like substance obtained from the white heart of the corn kernel. It is tasteless, but is very useful as a thickener, having double the thickening properties of regular flour. It is widely used to thicken sauces, gravies and puddings. It is best to stir it into water first before it is added to other foods, so that it can be more easily incorporated without creating lumps. However, if it is cooked for long periods of time, it will decrease its thickening qualities.
6. **Sago** - A starch that is extracted from the sago palm, used in baking, and as a thickener for soups and puddings.
7. **Seaweed** - Often used as a thickener in soups, stews and vegetable dishes. Vegetable Purees - selected types of vegetables that can be pureed into a thick mixture for use as either a thickener or emulsifier. The puree can also add flavor to the food being prepared. Wheat Starch - Used for thickening sauces, gravies, and puddings. It is best to stir it into water first before it is added to other foods, so that it can be more easily incorporated without creating lumps.
8. **Cream** - a common thickener for pan sauces, wine sauces and other white sauces. It provides a rich flavor and smooth texture to reduced-cream and double-cream sauces. Crema - It may be used as a food garnish for burritos,

enchiladas and fajitas, as a thickener for meat sauces, or to give savory dishes a thicker consistency and richer flavor.

9. **Egg Whites** - Beaten egg whites are often added into many baked items and desserts, providing volume, thickening the ingredients and acting as a leavening agent.
10. **Egg Yolks** - The yolks of eggs work well as a thickener when making different types of sauces, adding both a rich flavor and a smooth consistency. Beating 3 yolks with 1/2 tablespoon or so of cream will assist to thicken a cup of liquid. Typically, a warmed sauce that is to be thickened is used to temper the eggs, whisking a small amount of the sauce into the egg and cream mixture before adding the entire yolk/cream mixture to the sauce as it is being heated. Use caution when heating the sauce with the yolks, since yolks warmed excessively can coagulate and adversely affect the stiffening process, hardening the consistency more than desired for the sauce. As the sauce is heated, do not exceed temperatures above 185F to 195F.
11. **Flour** - All-purpose flour is a common thickener mixed into liquids, such as meat drippings for gravies or water and other ingredients for batters. Potato flour (potato starch), which is gluten free, is fine textured flour made from cooked, dried and ground potatoes. When mixed with other flours in bread making, it produces a moist crumbed bread. Flour is also mixed with butter to make another type of thickener referred to as a roux.
12. **Groats** - The whole kernels of grain, such as barley, buckwheat or oats that have been hulled, cleaned and sometimes roasted, but not cut or flattened. They are similar to barley and can be used in soups as a thickener to stiffen the texture of the soup broth.
13. **Coriander powder**- used in Indian cookery
14. **Poppy seed paste**- used in Indian cookery
15. **Coconut milk**- used in Indian cookery
16. **Gram flour(besan)**- used in Indian cookery

## 2. PROCESSED THICKENERS

1. **Gelatin** - The gelatinous juices released from meats or fish during the cooking process. As a natural gelatin, this highly flavored juice is added when the sauce is finishing its cooking phase in order to provide a glaze such as glaze de viande for meats or glaze de poisson for fish. The gelatin creates a syrupy-textured sauce that is often enhanced and thickened further with the use of a fat, such as butter.
2. **Cheese** - a type of thickener that is not often used due to inconsistent results. Fresh cheese is required to make the best sauces and as the cheese ages from fresh to several days old, it becomes rougher in texture and possibly more acidic in flavor.
3. **Beurre Mani** - Similar to a Roux, this paste is made with equal quantities of flour and butter kneaded together to be used as a thickener that is whisked into sauces, soups, and stews. Unlike Roux, it is not cooked until it is added to the sauce.
4. **Carrageenan** - A group of related carbohydrates produced naturally by boiling red seaweed, carrageenan is used as a thickening agent for a variety of commercially produced food items such as milk, ice cream, puddings, syrups, marshmallow fluff, and other food items.
5. **Pectin** - A gelling substance found naturally in vegetables and fruit. Pectin is needed as an ingredient when making jams and jellies to thicken the mixture in

order to make it gel. Available as a liquid or a powdered form in food stores, different brands of pectin contain different ingredients so it is wise to check recipes for instructions on the specific brand suggested so the ingredients required are used to achieve the desired results. The difference typically involves the amount of acid and sugar required to stiffen the food being prepared.

6. **Roux** - A thickening agent made from cooked flour and fat (generally butter, but lard and vegetable oil are also used). It is often used as a thickener for sauces, gravies, or soups and is cooked to varying degrees to create a white, blond, or brown roux, depending on how it will be used. The accepted standard for the quantities of flour and fat to use for a roux is a ratio of 6 parts flour to 4 parts fat by weight. The quantity of liquid that will be added to the roux must also be considered when preparing the roux as well as the desired thickness of the resulting sauce, gravy, or soup.
7. **Slurry**- a thin mixture of water and flour. It is widely used in thickening soups and sauces in Thai and Chinese cookery.

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#### 4.3.7.11 SWEETENERS

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Are something added to foods to make them taste sweeter. There are two types of sweeteners:

- A) **NATURAL SWEETENERS:** They are those which are processed from natural sources like from plants( roots, stem, leaves, flowers and fruits) and from products made from animals like honey. Natural sweeteners include-
  1. **Simple sugar**- obtained by processing sugarcane, barley, beetroot, maple tree, sorghum, grapes, potatoes etc. also known as table sugars.
  2. **Icing sugar**- also known as confectioners' sugar. It is very fine sugar mixed with 3% starch powder (corn flour). Used in dusting, decorating, icing cakes and pastries.
  3. **Brown Sugar**- It is simple refined sugar with some molasses returned to it. It is brown in color and has distinctive color and flavor. As it contains moisture, it forms lumps . Used in the preparation of certain puddings, cakes, etc.
  4. **Date sugar**- obtained from fruits of date plant- used in preparation of pies and puddings.
  5. **Fructose**- is derived from fruit sources and is sweeter than refined cane sugar so less is needed. It is believed to disturb the blood sugar less than refined cane sugar, though it has little to offer in nutritional value.
  6. **Honey**-of course is made by bees. It is a combination of glucose, fructose and sucrose.
  7. **Stevia**- is a perennial plant in the aster family that provides a very strong powder or liquid sweetener. It has no calories at all.
  8. **Fructose**- from fruits like mango, guava, pineapple, melons etc.
  9. **Glucose**-It is present in body and in fruits in natural form. Commercially it is sold as Dextrose. It is less sweet than sucrose, but it is use because of its waster holding capacity. It has ability to control the size of the crystals in candies and as a food for yeast, during the fermentation.
  10. **Corn Syrup**-consists of glucose or dextrose. It is prepared by converting corn starch into simple sugar compound by the use of enzymes. Used in icing and candy masking.

**B) ARTIFICIAL SWEETENERS:** A sugar substitute is a food additive that duplicates the effect of sugar in taste, usually with less food energy. Some sugar substitutes are natural and some are synthetic. Those that are not natural are, in general, called artificial sweeteners. here are some artificial sweeteners:

1. **Saccharin** is a sweetener that is up to 70 times sweeter than sugar. It is used in baked goods, jams, drinks and as a table top sweetener. It is available as Sweet-n-Low and Sweet Twin.
2. **Aspartame**-The sweetener aspartame was approved for use in 1981 as a table top sweetener and in beverages, baked goods and candy. It is 20times sweeter than sugar and is available as Equal and Nutrasweet.
3. **Acesulfame-K** is similar to aspartame and is available as Sunette, Sweet One and Diabetisweet. It has been approved for use in products like chewing gum, soft drinks and drink mixes.
4. **Sucralose**-The artificial sweetener sucralose was approved in 1998 and is the only sweetener derived from real sugar. It is 60 times sweeter than sugar but does not cause tooth decay. Sucralose is available as Splenda.
5. **Lead acetate** (sometimes called sugar of lead) is an artificial sugar substitute made from lead that is of historical interest because of its widespread use in the past, such as by ancient Romans.

Other artificial sweeteners rarely used in food industry include:

1. Alitame
2. Dulcin
3. P-4000
4. Neotame
5. Sorbitol

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#### 4.3.7.12 ACIDS

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These acids are widely used in preparation of variety of products in cookery. They are:

- Dilute Acetic Acid or Synthetic Vinegar-
- Lemon Juice or Citric Acid
- Tartaric Acid or Cream of Tartar (Potassium hydrogen tartrate }
- Tamarind Juice
- Raw pineapple, papaya, fig and mango juice
- Coccum

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#### CHECK YOUR PROGRESS-II

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Q1. What precautions are to be taken while cooking frozen vegetables?

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Q2.How ill you test freshness of egg?

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Q3. What are the uses of fruits in cookery?

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## 4.4 SUMMARY

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The basic fundamental of a food operation is to turn a raw food item into an edible product by applying or extracting heat from it. The success of any food service operation is dependent on how the raw ingredients are procured, processed, cooked, and then served to the customer to generate profit. If there is a flaw in any one of the steps, it will affect the profit margin of any organization. For the preparation of food, tasty, colourful dishes it is essential to have a basic knowledge of the raw materials, their characteristics and the special part they play. Also it is helped to improve the quality and get standard end of the product. The materials are does classified according to the part they play in making up a dish. Cereals and pulses and other foundation ingredients are the vital food components for human beings. They provide maximum energy to humans. Varieties of commodities are used in culinary. Similarly fats and oils and sugar and fruits and vegetables also form a major part of our diet. They all are considered to be the backbone of cookery. Infact they all are considered as the primary food for humans. Their various types and varieties add different flavours to our diet and numerous dishes are found in the world

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## 4.5 GLOSSARY

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1. **Bromated flour**-Bromides added to flour help to ensure consistent results in baked goods. The bromides help to strengthen the flour to achieve optimum gluten formation for bread making.
2. **Rice Bran oil**- This oil is rich in Vitamin E which gives oxidative stability to the oil. In addition it has higher cholesterol lowering effect than other oils. It is used for human consumption (rich in vitamin E) and soap making.
3. **Purple corn (Maiz morado)**-Peruvians use this to make beautiful purple drinks and puddings.
4. **Cornflour**: Cornflour is produced from maize and is the crushed endosperm of the grain which has the fat and protein washed out so that it is practically pure starch. It is used for making custard and blancmange powders, because it thickens very easily with a liquid, and sets when cold into a smooth paste that cannot be made from other starches.
5. **Bulbs**- Usually grow just below the surface of the ground and produce a fleshy, leafy shoot above ground. Bulbs usually consist of layers or clustered segments. e.g. onion, shallot, garlic, spring onion, leek, fennel.

6. **Tubers-** Vegetables which grow underground on the root of a plant. e.g. potato, kumara, yam, taro, Jerusalem artichoke, Maori potato.
7. **Chiffonade-** very finely sliced or shredded leafy vegetables used as garnish or base for cold food presentation.
8. **Buouncy method-** method of judging freshness of egg by dipping it in a glass of water.
9. **Candling method-** is judging the freshness of egg by looking it against bright light.
10. **Kosher salt-** also known as Jewish salt, contains no additives or added iodine.
11. **Rancidity** is a term generally used to denote unpleasant odours and flavours in foods resulting from deterioration in the fat or oil portion of a food.
12. **Fondant-** sugar syrup beaten with cream of tartar to form thick white paste. Used for decorating pastry or confectionary.
13. **Slurry-** a thin mixture of water and flour. It is widely used in thickening soups and sauces in Thai and Chinese cookery.
14. **Stevia-** is a perennial plant in the aster family that provides a very strong powder or liquid sweetener. It has no calories at all.
15. **Icing sugar-** also known as confectioners' sugar. It is very fine sugar mixed with 3% starch powder (corn flour). Used in dusting, decorating, icing cakes and pastries.

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## 4.6 CHECK YOUR PROGRESS-I ANSWERS

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1. Commodities can be classified into three groups:
  - Perishable- egg, spinach, meat, fish, milk, fruits
  - Semi-perishable – potatoes, salamis, sausages, pickles, ginger, garlic
  - Non-perishable- oil, flour, cereals, nuts, tea, coffee, cocoa, salt
2. Functions of flour
  - Provides structure to the cooked product
  - Used as thickening and binding agent.
  - Improves the texture and consistency of the food.
  - Add flavour to the food.
  - Absorbs liquid from the food.
  - Contributes definite colour to the finished product.
  - Provides nutrition to the food.
3. Different cuts of vegetables
  - a) Chiffonade- very finely sliced or shredded leafy vegetables used as garnish or base for cold food presentation.
  - b) Roundel's- round, disc shaped cut from cylindrical piece of vegetable.
  - c) Diagonals- are oval shaped slices or elongated slices cut from cylindrical piece of vegetable
  - d) chopping- uneven small cuts
  - e) Brunoise- fine dices- 1/8" x 1/8" x 1/8" or small dice 1/2"
  - f) Mecedoine- 1/2 cm or 1/4 " dices
  - g) Julienne- very thin strips of 1/8" x 1/8" x 1 1/2 "
  - h) Shredding- thin slices of uneven sized shreds
  - i) Jardinière- baton shape- 1" x 1/4 " x 1/4 "



- j) Batonnet-  $\frac{1}{4}$  " x  $\frac{1}{4}$  " x  $\frac{1}{4}$  "
  - k) Paysanne-  $\frac{1}{2}$  " x  $\frac{1}{2}$  " x  $\frac{1}{4}$  "
  - l) Wedges- tomato or lemon cut into moon shape
  - m) Mirepoix- rough diced vegetables such as onions, carrots, celery and leeks
  - n) Bretonne- 1" cubes
  - o) Delmonico-  $\frac{3}{8}$  " cube
  - p) Chateaux / Tournier- barrel shaped
  - q) Straw-  $\frac{1}{10}$  " x 2"
  - r) Pont neuf- 1" x 1" x  $2\frac{1}{2}$  "
4. Nutritionally Ragi it is almost as good as or better than wheat or rice. The major proteins of ragi are prolamins and glutelins and they appear to be adequate in all the essential amino acids. Ragi is rich in minerals especially calcium. It is also rich in fiber. It is also rich in phytate and tannin and hence interferes with mineral availability. It contains B-vitamins but is poor in B<sub>2</sub> .

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## 4.7 CHECK YOUR PROGRESS-II ANSWERS

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1. Most frozen vegetable products will have specific instructions for cooking, but here are a few tips to ensure you preserve the quality of the vegetables you are preparing:
  - Although vegetables are blanched before freezing, they should be cooked thoroughly before serving in cold food items.
  - Use a very small amount of water, usually  $\frac{1}{4}$  to  $\frac{1}{2}$  cup - just enough to cover the bottom of the cooking utensil.
  - Heat the water first, and then add the vegetables.
  - Don't overcook, as this will cause the vegetables to lose nutrients and quality of texture.
  - Use only what you need and store the rest, because reheating causes a loss of nutrients.
  - As with canned vegetables, maintain appearance by adding last to other dishes and not overstirring.
  - Microwaving is best as it helps retain vitamins and fresh flavor.
2. Freshness of eggs can be tested in two ways:
  - 1) **Buouncy method**- dip an egg in a glass of water, If it floats on top, it is fresh and if it sinks in the bottom, it is stale. In any stale egg, thick white gradually changes into thin white and the water passes from the white into the yolk. The yolk loses strength and begins to flatten resulting in evaporation of water and replacement of air inside. This causes the egg to float on the water
  - 2) **Candling**- When fresh eggs are held to the strong light, they have a uniform rosy tint and the yolk is firmly suspended in the center. The look more transparent on top. Stale eggs look cloudy and opaque and the yolk settles against the shell. Eggs having dark spots on the shell are definitely bad.

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## 4.9 TERMINAL QUESTIONS

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### Short answer type questions:

- Q1. “All dairy products are perishable item”
- Q3. What are the uses of wheat and its products?
- Q3. What are the advantages and di-advantages of par-boiled rice?
- Q4. How will you select cereals and pulses for purchase?
- Q5. Why are vegetables cooked?
- Q6. Write short note on edible mushrooms
- Q7. What are the uses of eggs in cookery?
- Q8. Different types of salts used in cookery.
- Q9. What should a cook do to get maximum flavour from spices?
- Q10. What are the characteristics of fats and oils?
- Q11. Write a note on different stages of cooking of sugar.
- Q12. Purchasing vegetables and fruits

### Write short notes on:

1. Self-raising flour
2. Par-boiled rice
3. Rice products
4. Oats-varieties and uses
5. Prevention of lump formation
6. Different cuts of vegetables
7. Truffles
8. Characteristics of egg
9. Uses of salt
10. Retarding colour changes in vegetables while cooking.
11. Types of chocolate

What is the difference between :

1. Spices and condiments
2. Chiffonade and Delmonico
3. Pulses and legume
4. Chateaux and Macedoine

5. Candling and Buouncy method
6. Homogenized milk and pasteurized milk
7. Julienne and shredding

**Long answer type questions**

1. Write in detail about the types of flour used in kitchen.
2. Elaborate the importance and use of cereals in cookery.
3. How are pulses considered as important commodity in daily life? Explain in detail.
4. Classify vegetables with suitable examples.
5. Elaborate the preparation of vegetables before cooking.
6. Classify fruits with examples.
7. Explain in detail how you will purchase eggs.
8. Classify fats and oil and explain their characteristics and action on heat.
9. Write a detailed not on the use of different foundation ingredients used in kitchen.
10. Write in details about the importance of different foundation ingredients used in cookery.
11. What are the different raising and thickening agents used in cooking? Discuss.

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## UNIT-5

# INTRODUCTION TO COLD KITCHEN

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### STRUCTURE

- 5.1 Introduction
- 5.2 Objective
- 5.3 Function of the Larder Department
- 5.4 Responsibilities of the Chef Garde Manger
- 5.5 Larder control
- 5.6 Stock sheet
- 5.7 Liaison with Kitchen and Pastry departments
- 5.8 Use and care of machinery and utensils
- Check your progress-I
- 5.9 Starters
  - 5.9.1 Salads, garnishes, dressings
  - 5.9.2 Cold sauces
- 5.10 Force meat
  - 5.10.1 Casings
  - 5.10.2 Sausages and salami
  - 5.10.3 Pate, terrine and quenelles
  - 5.10.4 Galantine and ballotines
  - 5.10.5 Bacon, Gammon and Ham
  - 5.10.6 Mousse, Moussiline and Foi Gras
  - 5.10.7 Aspic, Jelly and Red glaze
  - 5.10.8 Food Preservation
    - 5.10.8.1 Brines, Curing and Marinades
- 5.11 Seasonings
- 5.12 Sandwiches
- Check your progress-II
- 5.13 Summary
- 5.14 Glossary
- 5.15 Check your progress-I answers
- 5.16 Check your progress-II answers
- 5.17 Further reference/bibliography
- 5.18 Terminal question

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## 5.1 INTRODUCTION

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The Cold Larder, or Garde-Manger, is a department set aside for the storage of perishable foods, both raw and cooked, and where foodstuffs such as meat, fish, poultry and game are prepared and made ready for cooking. In this department too, all 'Cold food items' found on the menu, such as the hors d'oeuvre, cold fish or meat dishes, all salads, cold sauces and dressings, are prepared and 'dressed'. One particular special duty of this department is the preparation and presentation of all types of cold buffet, which are nowadays a feature of so many functions.

For these functions to be carried out, it is essential that:

1. The larder be separated from the kitchen and located in a cool place. At the same time, it must be close to the kitchen to avoid undue running about between the departments which are closely interrelated.
2. It should be light, airy and well established and sufficiently spacious to allow the staff to carry out their duties in a clean and efficient manner.
3. It must also be able to store prepared foods and buffets in a cool and hygienic manner.
4. It should be equipped with the necessary fitting, machinery and tools. In accordance with the volume and/or quality of the trade of the catering establishment in which it is situated.

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## **5.2 OBJECTIVE**

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In the previous Unit, you have learnt in brief about the various commodities used in food service establishments. The commodities were the foundation ingredients of any kitchen. In this chapter you are going to learn the working of the larder department of the kitchen which provides the processed or pre-processed food ingredients which are used by the user departments in the kitchen. This department also called Garde-manger is responsible for the supply of all the cold items, fabricating large joints into small ones. Sometimes these joints are processed and then served like sausages, salamis etc. this department has a close and healthy relationship with all the other departments of the kitchen. It is also responsible for acquiring fresh ingredients from the market. You will also learn the different types of starters that are prepared and served including Horsd'oeuvres, salads, cocktails, sandwiches etc. The particular special duty of this department is the preparation and presentation of all types of cold buffet, which are nowadays a feature of so many functions. The especial features of this department are:

1. The larder be separated from the kitchen and located in a cool place. At the same time, it must be close to the kitchen to avoid undue running about between two departments which are closely interrelated.
2. It should be light, airy and well established and sufficiently spacious to allow the staff to carry out their duties in a clean and efficient manner. It must also be able to store prepared foods and buffets in a cool and hygienic manner.
3. It should be equipped with the necessary fitting, machinery and tools. In accordance with the volume and/or quality of the trade of the catering establishment in which it is situated.

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## **5.3 FUNCTION OF LARDER**

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The Larder section is the most spectacular and the busiest section, because the work is never-ending.

- As well as feeding the main kitchen with the prepared foods for processing, he has to keep the cold buffet supplied.
- He has a wide range of work to do, as the larder has various sub-sections such as horsd'oeuvres and a salad section, butchery section. The cold buffet work, sandwiches, canapés are his responsibility also.

- He caters both Ala-carte and buffet requirement of the hotel like a) cocktail reception b) dinner c) conferences d) salad bar.
- He assists the Executive Chef in day-to-day routine work.
- He is responsible for the upkeep and storage of all the perishable items.
- Responsible to check all the incoming or receiving perishable items in the stores.
- He is responsible for the over storage of food items.
- Responsible for training and maintaining discipline amongst his staff.
- Maintains a daily stock sheet of all perishable items issued to various other departments.
- He should be able to study the menu and banquet prospectus so that he can order for the perishables required in advance i.g. Volume forecasting.
- Responsible for maintaining hygiene and sanitation in his department.

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## **5.4 RESPONSIBILITY OF CHEF GARDE MANGER**

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Responsibilities of Chef Garde' Manger:

1. He assists the Executive Chef in his day to day routine work.
2. He is responsible to the Executive Chef for the efficient running of the Larder department and for the co-ordination of the work of its staff.
3. He is responsible for the upkeep and storage of all the perishable items.
4. Responsible to check all the incoming or receiving perishable items in the stores.
5. He is responsible for the over storage of food items.
6. He is responsible for all menu planning, developing new dishes, standardizing the food items produced in his department.
7. He should also advise the Head Chef as to what foodstuff items require using to prevent eventual wastage.
8. He is also responsible for co ordination between his staff and has to make sure that they have understood the work required from them and the production schedule, either daily or weekly. This co ordination also extends to the other departments and different kitchens as the Garde Manger does inter act with them all.
9. Responsible for training and maintaining discipline amongst his staff for their scheduling and duty rotas.
10. Maintains a daily stock sheet of all perishable items issued to various other departments.
11. He assists the head chef in standardization of recipe and portion control.
12. He should be able to study the menu and banquets prospectus in advance, so that he can order for perishables required in time i.e. volume forecasting.
13. Responsible for maintaining hygiene and sanitation in his department as per HACCP standard.
14. He surveys and analyses the current eating habits, new equipment and new products that have been introduced in the market that will help the Chef Garde Manger in his work.

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## 5.5 LARDER CONTROL

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The responsibilities of the Chef Garde-Manger, therefore, are many and varied. This person is responsible to the head Chef for the efficient running of the department and for the co-ordination of the work of its staff; for the training and discipline of larder staff; for the foodstuffs in the department, some of which may be stored in refrigerators or even in deep freeze, or preserved by other means. The Chef Garde-Manger is responsible for keeping a record of all foodstuffs and a day-by-day record of issues to kitchen or other departments. The Chef Garde-Manger must study the menus in advance, so as to be able to order meat, fish, etc., in time for the foodstuff to be prepared and cleaned and made ready for the kitchen in time for it to be cooked; and also to order all necessary stores for the various larder productions such as salads, hors d'oeuvres, sauces, buffets, etc. The Larder Chef is responsible for the efficient storage of food to avoid deterioration and wastage and for cleanliness and hygiene in the department, to avoid any danger of contamination and possible food poisoning. He should also advise the Head Chef as to what foodstuff items require using to prevent eventual wastage.

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

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

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## 5.6 STOCK SHEET

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The stock sheets and the order sheets should be formatted simply, to save time and to make the working less complicated.

For some sub departments, devising an easy and simple system is reasonably easy. In some cases it is not so easy for example; also keeping of the stock of food sent in and returned by the cold buffet can be complicated and time wasting if one is to measure every ounce or inch. Therefore it is necessary to accept some rule of thumb providing it is well supervised. An experienced chef Garde Manger should be able to tell at a glance the weight, or number of Portion of a given joint or cold dish. The butchery department also presents some Problems and the stock sheet for this department needs

careful consideration. Each establishment will devise its own system taking into account its own problems.

Then how can be this sorted out?

- This is the stock sheet that is used to re-order the supplies from the stores. This record is not very complicated to handle.
- The complications come in keeping the records of the food sent in and returned by the cold buffet for consideration. This activity needs to be personally supervised and over a period of time the consumption can be estimated, within very narrow margins.
- The butchery department also presents some problems and the stock sheet for this department needs care.
- Fish, salad vegetables, canned foods and dairy produce are comparatively easy to control.
- The stock sheets are mostly prepared as soft copies on the computers.

**DEPARTMENT: LARDER**

**SECTION: Hors d'oeuvre**

**DATE:**

Item	Unit	Stock	Unit price Rs.	Cost Rs.	Order
Cauliflower	Kg	2			14
Shrimp	Tins	5			8
Eggs	Doz.	2 ½			7
Ref. oil	Ltr.	4 ½			6
Vinegar	Ltr.	3			4

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## 5.7 LIAISON WITH KITCHEN AND PASTRY DEPARTMENT

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Larder is both –

1. A storage department for most perishable foods
2. A preparation department for all the cold food stuffs.

The larder staff, under the leadership of the chef garde manger is responsible for-

- The ordering
- Storing
- Preserving of stores
- Keeping stocks up to date
- Accounting for meat, fish, poultry and game
- These food stuffs need dissecting, dressing, cutting into required joints or portions and doing mice-en-place for cooking.

For this reason it is important that-

- The larder section should be in close access to the rest of the kitchen.
- As well as access to all the sections of the kitchen and this passage needs to be uninterrupted.
- To be effective and the smooth run of the operations, the larder department must operate in perfect harmony with the main kitchens, various specialty kitchens as well as the pastry department, to avoid confusions and wastage.
- Lack of liaison will result in duplication of work.



- Likewise, pastry for pies or puddings and various savouries served with the larder department are best prepared by the pastry staff. Such tasks as lining of the pudding basins or the covering of the meat pies are examples of such cooperation.
- On the other hand, the savoury filling required by the pastry section, such as sausage rolls, will be prepared in the larder section.
- Another important function of the larder section is to process and utilize the leftovers of any meals such as parts of cooked joints, poultry, fish or even eggs, potatoes and vegetables.
- Larder section tries to utilize these to the best of the abilities. Some of these will be used for the preparations of the starters and the salads, others suitably trimmed and dressed and reserved.
- A number of garnishes and accompaniments to dishes are prepared in the larder section.
- Such items as meat cuts, bones, offal's, stuffings, forcemeats, lardons or bacon rashers are provided by the larder section.
- All the cold sauces for the hot dishes are also prepared by the larder section such as tartare sauce, mint sauce, vinaigrette.
- The larder also prepares compound butter or butter sauces.
- It provides the buffet carvings and decoration.
- It provides sandwiches, canapés and other Horsd'oeuvres to the user departments.

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## **5.8 USE AND CARE OF MACHINERY AND UTENSILS**

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1. Mincing machine and food processors-
  - These two machines have an important function in the larder. The mincer is used for the mincing of raw meats for sausages, hamburgers, meat loaves, mincing of fats prior to rendering for dripping.
  - A food processor is a useful tool in the mixing of the raw and cooked farces, pates, mousses and puree mixtures as well as some sauces. It is also handy for the making of breadcrumbs from the day old breads.
  - These metal machines are quite expensive and should be robust for heavy duty for commercial use.
  - The mincing and the processor attachments can be dismantled for cleaning which should be done with hot water containing grease solvents, then rinsed and dried before re-assembling.
  - The machine needs to be lubricated at regular intervals with the lubricating oil.
  - The operator should study the instruction manual to become familiar with the oiling points.
2. The slicing machine
  - Is used for cutting slices of cooked meats such as ham or tongue, or any other boneless joints of meat.
  - It is also used for cutting bacon or gammon rashers.
  - A calibrated scale is fitted to determine the thickness of the slices.
  - They may be hand-operated, semi-automated or fully automatic.

- The cleaning of the machine should be done carefully following the instructions on the manual. No food should be left clinging to the parts which cannot be removed for cleaning as the bacterial growth will occur.
  - The blades should be kept sharp always using the grindstone attachment provided along.
  - The machine should be kept lubricated with the oil provided.
3. Scales and weighing machines
- There are various types of weighing scales- large platform scales for weighing large meat joints. There are graduated scales fitted with a price chart showing the prices at a glance.
  - No maintenance is necessary other than keeping them clean and hygienic. Sponging them with a cloth soaked in hot water and then drying thoroughly will do the needful. The pans of the smaller scales should be removed and washed well in hot water.
  - Foodstuff should not be placed directly onto the platform or the pans of the scales but should be kept in some container or trays or a sheet of greaseproof paper when being weighed.
4. Electric grinding machine
- This machine is used for grinding an edge on knives and choppers or cleavers. It should be used if only the carborundum stone fails to set an edge. Frequent use will wear the knives and the choppers down very fast.
  - Make sure that there is sufficient water in the well and the grindstone is wet while the sharpening takes place.
  - Keep the machine clean.
  - Lubricate the machine as per the instructions in the manual.
5. Boiling plate or gas rings
- These are used to heat or cook as required such as cooking the vegetable hors d'oeuvres, for rendering fats, making aspic jelly, sauces, pickles and other larder preparations.
  - Spilling or boil overs should be wiped and cleaned with warm water and soap solution. The burners need to be cleaned on the periodical basis.
  - The enamelled parts of the surrounding should be sponged down with water. Abrasives should not be used as they damage and scratch the enamel.
6. Salamander / grill / toaster
- These are used for grilling or toasting many foodstuffs for making savouries and canapés and for grilling sausages etc.
  - For cleaning the burners should be lightly brushed to prevent the holes from clogging. The metal reflectors should be wiped on a regular basis.
  - The fat drip tray must be emptied and cleaned daily. A little water in the tray will help the grease from baking on. Do not allow the crumbs to burn in the tray.
  - The enamel parts must be wiped with a damp sponge on a daily basis.
7. Butchers' blocks
- These are used in the butchery for jointing and cutting meats.
  - They have the advantage of being reversible. They can also be re-serviced when badly worn out by sawing at the timber yard.

- A good general rule is to keep the surface as clean and dry as possible and should be washed well and drained and dried after each use.
8. Saucepans and lids
- They are mostly stainless steel or aluminum or latest can also be hard anodized. They require utmost care for maintaining them clean.
  - They should be washed in warm soapy water and dried well after use.
9. Tables, counters and floors
- Steel tables are used as work tables. Always keep them clean and never use their surface for chopping or cutting as the damage can be two ways.
  - Chopping boards which are color coded are used for this purpose.
  - The tables should be cleaned by sponging with hot soapy water and rinsed with warm water and then dried after use.
  - At the end of each session, the sinks, the counters and the floors must be well cleaned
10. Refuse bins
- The waste bins should be lined with disposal bags and be emptied on the daily basis.
  - The bins should be stored in air conditioned temperature as they store lot of perishable wastes.
  - They should be thoroughly cleaned, inside out, on the daily basis.
11. Refrigerators and freezers

#### Refrigerators-upright

These play a very important part in the functioning of the garde manger as all perishables can be stored at a low temperature to prevent deterioration and the growth of pathogenic bacteria.

- The refrigeration temperatures are set a little above the freezing point and can range from 2-5 degrees C.
  - There should be no fluctuations in the temperatures and keep them as constant as possible.
  - Always check the thermostat is working well
  - Have the refrigerators serviced regularly
  - Defrost regularly to maintain the temperatures. The refrigerator should be thoroughly cleaned. The racks and bars be removed and washed with warm water.
  - During the defrosting time, the food should be transferred to an alternative storage.
  - Never use knife or a sharp instrument to dislodge the ice formation.
  - Open the door as little as possible for the temperatures to be maintained inside.
  - Never place hot food into the refrigerator as it will raise the temperatures inside.
12. Under counter refrigerators
- The under counter fridges have been developed to fight the space restrictions and for the maximum utilization of the spaces.

- These are normally used to store ready to cook meats and fish. Positioned in the hot and greasy kitchens, these fridges are specially in need of frequent thorough cleaning and servicing.

### 13. Deep freezers

With the increasing bulk of the food production for the catering establishments and the use of more and more of the frozen foods, there is an intensive use of freezers. They help in prolonging the storage life of the perishables.

- Under refrigeration temperatures, the food can deteriorate rapidly through the action of the microbes, enzymatic and chemical reactions.
- By reducing the temperatures, these reactions are slowed down.
- Increased use of deep freezers can be due to bulk buying, special seasonal rates or discounts or irregular supply or delivery.

#### Types of deep freezers

There are three types of deep freezers. The major difference is their shape and size.

##### A. Built-in walk-in type

- These are found in large catering units such as hotels, hospitals, canteens and large restaurants.
- The average size of the deep freezers is 2x2x2.25 mtrs. But these can be tailor built in all shapes.
- All such freezers have divisions within them allowing for the separation of the meat, poultry, fish or vegetables.

##### B. Deep freeze cabinets

- These are of two types- the box or the chest types, which is the most popular and cheapest to buy. This has the disadvantage of storing all the foods together as there is no or little compartmentalization. Quick access to the food is often difficult and following first-in-first-out is normally difficult in this.
- The second type is the upright one, to look at it is like a refrigerator. It is more expensive, but by its design and inner shelving, it allows quick and easy access to the foods required.
- These also come having two or three doors with different compartments, in order to store different raw material separately.
- Latest have also incorporated the quick freezing shelves which can be used before freezing all the foods and then storing them.

##### C. Fridge- freezer cabinet

- This is a combination of the fridge and a freezer compartment.
- Originally meant for larger households, but these can also be used by smaller catering units
- These are available in two doors or three door options as well.

#### Quick freezing

- This is the technique wherein the temperature of the food is brought down to the required level, in the shortest possible time, to decrease the growth of the bacteria.
- The food is brought to the point when there is an ice formation in the cells of the food.

- It is of greatest importance that this stage be passed through as quickly as possible, because the longer it takes for the ice to form, in the intercellular structure, the larger will be the ice crystals and this will make the cellular structure to rupture and collapse. This will cause the food to drip when thawed and the food will become useless.
- Nutrients are drained away and also there is a major moisture loss.
- It is therefore, important to see that the food to be deep frozen should be subjected to a quick freeze procedure.
- Then these are to be stored at -20 degrees C.

14. Other larder tools

Other small equipment required in the larder section are-

- Serving spoons and ladles
- Sieves
- Colanders
- Conical strainers
- Meat presses
- Pie moulds
- Whisks
- Egg slicers
- Steel basins
- Graters
- Cutlet bat
- Trussing needles
- Larding needles
- Larding pin
- Lemon zesters
- Vegetable scoops
- Butchers hooks
- Skewers
- Brinometer

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**CHECK YOUR PROGRESS EXERCISE-I**

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Q1 What are the attributes of Larder department?

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Q2. What is the function of slicing machine?

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Q3 What is quick freezing?

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## 5.9 STATERS

**Definition:** Starters are small portions of food items served in the first course to stimulate the appetite. They may be served in liquid or in solid form.

If served before a meal it should be small. They may be hot or cold, plated, or served as finger food. If served at a cocktail party, it is usually called hors d'oeuvres.

Appetizers or side dishes are ought to be small, dainty and toothsome. They add variety to the menu and diet. It is important that the appetizers should be colorful, decorated and well presented. They produce variety in flavor and texture. The idea behind is that one should nibble a few, but refrain in making a meal of them. They may be served for luncheon, dinner or supper. They are meant to stimulate the appetite.

An appetizer may be served in many forms such as cocktails, canapés, hors d'oeuvres, as long as it performs its primary function

**Classification of appetizers:** Appetizers can be broadly classified as:

- Horsd'oeuvres
- Canapés
- Cocktails
- Salads

**1. Horsd'oeuvres:** - a food preparation that is served outside the main menu much before the main course. Horsd'oeuvre is the first course in the French classical menu. As it is the first food preparation that goes to the guest, it is said to be the introduction to the guest. There is a specialized kitchen for the preparation of Horsd'oeuvres known the Horsd'oeuvres section.

Horsd'oeuvres should be in small tidbits or in small portions, light, colorful and should have a delicate taste. They are classified into the following: -

- a. Horsd'oeuvres chaud (hot)
- b. Horsd'oeuvres froid (cold)

Horsd'oeuvres can be -

- **Singular** - Oyster, Foie grass, Melon
- **Compose** - Blinis, Ramequins, Quiche Lorraine
- **Varies** - Chicken, meat, eggs etc.

**a) Horsd'oeuvres chaud:**

- a. **Rissoles-** crescents of puff paste filled with minced meat, deep-fried in fat.
- b. **Ramequins-** Small, round straight sided soufflé dishes 8-10 cm in diameter made up of oven proof glass in which variety of eggs and cheese dishes are cooked.
- c. **Quiche Lorraine-** Tarts or tartlets of puff or unsweetened short crust pastry lined with bacon filled with thin slices of Swiss cheese covered with custard made of egg yolks and milk and cream and seasoned with salt and nutmeg.

- d. **Allumettes**- Puff pastry spread with cheese, lobster, goose liver or other paste cut into strips and baked.
- e. **Barquettes**- Small boat shaped moulds lined with puff or short crust paste, filled with salads, rice or semolina and baked.
- f. **Blinis**- Batter of wheat flour, milk, and yeast and egg yolk mixed with stiff beaten egg whites and whipped cream, seasoned with salt. Sometimes mixed with chopped hard-boiled eggs and herring and baked on a griddle.
- g. **Soups**- may be like piping hot, like cream of tomato, hot n sour soup, minestrone soup, mulligatawny soups or shorbas.
- h. **Bouchees**- Small puff pastry patties of various shapes filled with purees, ragouts and mince etc. They are served as appetizers.
- i. **Crepinettes**- Sort of flat round sausages made of poultry, game or forced meat wrapped in pig's intestines, brushed with beaten eggs, rolled in bread crumbs and deep fried.
- j. **Croquettes**- Prepared with minced meat, chicken, fish or paneer, rolled in cylindrical shapes, crumbed and deep-fried.
- k. **Kremoskies**- same as croquettes but dipped in yeast batter and deep-fried.
- l. **Beignets fritters**- raw or pre-cooked food and batter fried.
- m. **Columbites**- semolina cooked in stock, mixed with egg yolk, cheese, filled in small tartlets, sprinkled with bread crumb and cheese and baked.

#### b) Horsd'oeuvres froid (cold)

1. Assorted cold platters
2. Oeuf mayonnaise
3. Fruit cocktail
4. Fruit salad
5. Melons
6. Oyster
7. Salami
8. Fondants (very small croquettes made of puree of fish, meat, game etc.
9. Parma ham
10. Green ham
11. Green salad
12. Mousses (savory)
13. Sausage

**2. Canapés:** Canapés- are defined as small bite sized open sandwiches which are smaller than the normal open sandwich and is garnished according to the type of spread used. They are savory tidbits and do not have a set recipe. But keep in mind that they should be dainty, petite, fresh, have eye appeal and colorful. Base of these are pastry base with different butter spreads on top. Canapés are eaten by hand.

Cold canapés are served at buffets or lunches or with cocktails or aperitifs; hot canapés are served as entrees or used as foundations for various dishes. When served with game birds, canapés are generally fried in butter and spread with a gratin forcemeat, a puree of internal organs of the bird or foie grass.

**Parts of Canapé:** Canape has three parts. Base, Spread and garnish.

- **Base** - Cut out of breads, biscuits, toasts, éclairs, pastry case and Melba toast.
- **Spread** - is applied on the base may be butter or cheese or combination of both. The spread can be flavored with various kinds of flavoring such as pimentos, garlic, mustard, parsley, olives, pepper (green or black), tuna, herrings, ham, tongue, goose liver, chicken liver, chicken salad etc.
- **Garnish** - they should be colorful and dainty and should not be over garnished.

**Procedure of making Canapés:** Prepare all the ingredients and equipments in advance. Use the best quality of ingredients.

1. Cut or slice the breads lengthwise, toast the bread, cool.
2. Apply the required spread.
3. Cut into different shapes and sizes.
4. Garnish appropriately.
5. Apply aspic, cover with a plastic foil or a muslin cloth and refrigerate, ready to be served.

There should be a harmony in the spread and the garnish used e.g. if spread is bland, then use a piquant garnish such as capers, olives etc.

### EXAMPLES

**Anchovy canapés-** Bread applied with anchovy butter, with anchovy strips on top leaving a space in the center to be filled with chopped egg yolk and chopped parsley.

**Shrimp canapés-** Butter the base with shrimp butter, arrange small shrimps with tails on top, finish with sprinkling of fine herbs.

**Caviar cigarettes-** spread caviar butter on a very thin slice of bread, spread caviars on top and rolls to form cigarette.

**Canapé Rigollette-** butter a canapé with cayenne butter, sprinkle with a mixture of finely chopped boiled egg. Pour tongue strips, fine herbs and truffles.

**Herring ala Rose-** arrange fillets of smoked herring with boiled, sliced potatoes on the base, season with fennel and vinaigrette.

**Zakuski**—are larger in size than of canapés, also known as canapés ala russe . It originated in Russia in 1890. Chef Zakuski invented it. In former times they constituted part of the meal, especially dinner although they were served in a room adjacent to the dining room. The array of dishes was often such that diners would over indulge before starting the main meal. They are made with classical fillings-e.g. toasts covered with smoked fish with aspic, sweet and sour gherkins etc. Zakuskis are arranged on a sideboard or on trays for guests to help themselves

**Piroshki-** are also of Russian origin. They are little dumplings or filled pastries with different fillings like smoked salmon, eel, sturgeon, meatballs, beetroot etc. These are accompanied by different sorts of breads, mainly rye bread flavored with cumin, onion or poppy seeds. It is a type of Zakuski.



**Smorgasbord**-are Swedish version of Zakuski, meaning ‘table of buttered bread’ and it is a vast buffet from which guests serve themselves according to their appetite. The first dish was of Herrings, the king of Scandinavian food, followed by other fish dishes like salmon, smoked eel, lobster salads etc. the third course consists of cold meat and Swedish charcuterie like veal in aspic, liver pare etc. The fourth course includes hot dishes such as meatball in bell peppers, gratin potatoes etc. Several varieties of rye breads and pancakes were served and the meal would conclude with fruit based desserts such as baked apples, cheesecakes, fruit salad etc.

**3. Cocktails:** The term cocktails is used not only for alcoholic beverages and vegetable and fruit juices, but also for a group of appetizers made of selected sea food or fruits, usually with a tart or tangy sauce. These are generally served chilled and could be liquid or solid. They must be fresh and eye appealing. They could be single or assorted. All the fruits must be cut in attractive manner and the greens if used must be fresh and crisp. Cocktails are always served in cocktail glasses. Non-veg. cocktails are popular like Prawn cocktail and calms on half shelled are popular sea food cocktails, as are shrimp, crab meat, lobster and firm, flaked white fish with appropriate sauce. Fresh oysters and clams should be served fresh in their half shells, arranged on flat plates and on a bed of ice, along with cocktail sauce and lemon wedges.

### 5.9.1 SALADS, GARNISHES AND DRESSINGS

Salads can be defined as a dish of raw, cold or warm cooked foods, usually dressed and seasoned, served as an appetizer, side dish or main course. The food can be cold dish, or green vegetables or a mixture of fruit, or hot mixture of piquant foods or frozen mixture of bland foods or chopped fruit in aspic, coleslaw and potato or meat.

**Features:**

1. Salads should be fresh and have stimulating flavor.
2. Foods must possess piquancy or relish value.
3. Salads should be cold, crisp, colorful, well seasoned and attractive.
4. Arrangement of salads on the platter should be simple and easily handible.

A salad can be served in various different courses, such as:

1. **Salad course:** In a very formal meal experience, salads are sometime served after a main course. Such salads are light and refreshing in nature and provide a change from the heavy main course. Well-dressed salad greens and savoury vegetables are a popular choice.
2. **Main course:** It is also substantial enough as a main dish. One of the body building foods such as meat, fish, egg or cheese forms the base. The volume and richness of these salads are adequate to satisfy a normal appetite.

**Accompaniments:** The salad is also served as accompaniment with the main course.

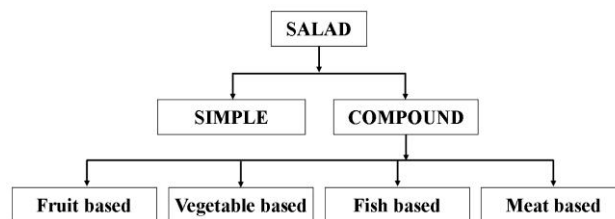


Fig. 5A

Classification of salads: (Fig.5A)

**1. Simple salads:** - is divided into a) all green b) other vegetables. They can be served raw or cooked.

All green salads----	Watercress salad
	Lettuce salad
	Endive salad
	Sorrel salad
Other vegetables---	Beetroot salad
	Tomato salad
	Cucumber salad
	Radish salad

**2. Compound salads:** - contains one or more ingredients. Vegetables, fruits, fish, poultry and game are incorporated. They are marinated and bound again with a dressing. Such salads can be further subdivided in four major groups:

1. Fruit based
2. Vegetable based
3. Fish based
4. Poultry, game or meat based

Basic parts of a compound salad are:

- a) **Base** - under liner of a salad to give base, normally green vegetables like lettuce or cabbage, endive, cress, ice berg, mustard etc.
- b) **Body** - The body comprises of the main ingredient of the salad. It must be proportional to the base. The body must comprise of small bite size pieces of the ingredients. The ingredients used should have a balance of flavours taste and colour.
- c) **Garnish** - It is very important because it adds eye appeal and at times enhances taste. It should be simple, small and neat. Some classical garnishes are:
  - i. **Americaine**- The term is applied to fish garnishes containing thin slices of lobster tail, truffles and americaine sauce, This name was given by a French Chef, Pierre Fraise in 1860, who settled in Paris having worked in America. E.g. Boiled eggs a la americaine, scrambled egg a la americaine.
  - ii. **Albigeoise**- named after the town of Albi in Spain, consists of stuffed tomatoes, and potato croquettes, it accompanies joints of meat.
  - iii. **Alsacienne**- This French garnish consists of sauerkraut, ham, salted bacon or Strasburg sausages and goes with roast or braised pork, fried pheasant, braised duck and goose.
  - iv. **Andalouse**- This French garnish goes with large joints of meat, particularly beef or saddle of lamb. It includes sweet bell peppers, stuffed or sautéed tomatoes, rice pilaf, fried aubergines and slices of Chorizo.
  - v. **Dieppoise**- Is a garnish named after the port of Dieppe in France, which is famous for its fish, like, sole, shrimps, mussels etc. The dishes are garnished with mussels, shrimps and mushrooms and masked with white wine sauce.
  - vi. **Financiere**- is a rich classical French garnish for joints of meat, calves sweetbreads or braised poultry. It may be also used as filling for crudités, timbales, bouchees and vol au vents. It consists of cocks combs, chicken quenelles, finely sliced mushrooms and shredded

- truffles flavored in Madera all bound with a sauce containing Madera and truffle essence. E.g. Supremes of chicken a la financiere
- vii. **Mariniere**- A method of preparing shellfish or other seafood, especially mussels, by cooking them in white wine, usually with onions and shallots. The garnish also sometimes includes shrimps, cray fish, frogs and various types of seafood. E.g. Cray fish a la mariniere.
  - viii. **Milainaise**- Food prepared in the style of Milan is generally dipped in eggs and bread crumbs, mixed with grated Parmesan cheese, then fried in clarified butter. This is a typical garnish consisting of juliennes of ham, mushrooms, tongue, truffles and tomato. E.g. Ravioli a la milanaise.
  - ix. **Mirabeau**-is a garnish consisting of anchovy butter, fillets of anchovy and stuffed olives. E.g. Entrecotes mirabeau.
  - x. **Normande**-is a garnish made of oysters, mussels, mushrooms, crayfish tails, gougon of sole, slices of truffle and coutons. E.g Apple puffs a la normande.
  - xi. **Reforme**- juliennes of ham, tongue, beet root, white of egg and gherkins
  - xii. **Rejane**- is named after the actress Gabrielle Reju in 1920.. This garnish consists of small pieces of sautéed meat or braised calves sweet bread duchess potatoes, spinach, artichokes and slices of poached bone marrow.
  - xiii. **Rohan**-is a garnish for braised or sautéed poultry, consisting of artichokes hearts topped with slices of foie grass and truffle, arranged alternatively with tartlets filled with cocks kidneys in supreme sauce.
  - xiv. **Viennoise**-Slices of lemon, anchovy, sieved white and yolks of egg and parsley
  - xv. **Zingara**- contains paprika, tomato sauce, Juliennes of ham, mushrooms, tongue and truffles. This garnish is served with cuts of meat, poultry and poached eggs.

**d) Dressing---** It adds taste, flavor and better appearance to the salads besides improving digestibility, palatability and food value. Dressing may be in liquid or semi liquid form. It can be made with a variety of ingredients ranging from oil-vinegar, cream, yogurt, egg, and cheese.

Various oil used for making a dressing are:

- Olive oil
- Walnut oil
- Salad oil
- Groundnut oil
- Sesame oil
- Grape seed oil
- Hazelnut oil

Various vinegars used for making a dressing are:

- Tarragon vinegar
- Balsamic vinegar
- Red wine vinegar
- White wine vinegar
- Malt vinegar

- Sherry vinegar
- Raspberry vinegar
- Cider vinegar

**Some commonly used dressings are:**

1. Sauce Louis - Mayonnaise and heavy cream combined with chopped green pepper and green onion seasoned with chilli sauce and Worcestershire sauce and lemon juice.
2. Blue cheese dressing - Creamy dressing containing crumbled blue cheese.
3. Roquefort dressing - Vinaigrette containing crumbled Roquefort or blue cheese.
4. French dressing- Three parts Oil and one part vinegar with mustard and garlic.
5. English dressing- one part of oil and two part vinegar, English mustard and seasoning.
6. American vinaigrette- equal quantities of vinegar and oil, mustard and seasoning.
7. Lorenzo dressing - Vinaigrette with chilli sauce and chopped watercress.
8. Anchovy dressing - Vinaigrette and mashed anchovies.
9. Italian dressing - Vinaigrette with garlic and herbs: oregano and basil and dill.
10. Half-and-half dressing - Half mayonnaise and half vinaigrette seasoned with minced garlic and mashed anchovies and grated Parmesan cheese; especially good for combination salads.
11. Mayonnaise - Egg yolks and oil and vinegar.
12. Russian dressing - Mayonnaise with horseradish grated onion and chilli sauce or catsup; sometimes with caviar added.
13. Salad cream – A Creamy salad dressing resembling mayonnaise.
14. Thousand Island dressing - Mayonnaise with chilli sauce or tomato ketchup and minced olives and peppers and hard-cooked egg.
15. Acidulated cream: Three part of thin cream to one part of lemon juice, salt and pepper.

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### 5.9.2 COLD SAUCE

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The variety of cold sauces is as wide as the hot sauces, which is virtually endless. These can be categorized under four groups-

1. Those based on basic vinaigrette dressing
2. Those based on mayonnaise
3. Those based on boiled dressing
4. Specialty sauces

Many ingredients can be added to give a wide spectrum of derivatives.

1. **Basic vinaigrette dressing-** This is the simplest of the three primary cold sauces. The basis of this sauce is vinegar, oil, salt and pepper. The mixture of these creates a very temporary emulsion. The proportion of oil to vinegar is normally 3 parts oil to one part vinegar.
  - However these proportions can change. One has to achieve a balance of oil and vinegar which will enhance the flavor of the salads and not overpower it.
  - The type of oil and vinegar used also will give specific variations to the dressing - Salad oil, olive oil, walnut oil, raspberry vinegar, balsamic vinegar.
  - Various herbs like basil, oregano can also be added to create different flavors.
  - The oil is used to enhance the mouth feel and vinegar to develop the taste and the flavors.
  - Flavor enhancers can be added such as- sugar, soya sauce, honey, fruit juices.

- When we require a more stable emulsion, then additional emulsifiers can be added. This is called an emulsified French dressing. The whole eggs and dry mustard are the emulsifiers which are added.

## 2. Mayonnaise

- Is a stable emulsion sauce.
- It is used as salad dressing and sandwich spreads
- It is also commercially available and is more stable as additional emulsifiers such as lecithin are added.
- Mayonnaise can be combined with numerous ingredients to give a number of derivatives.
- Mayonnaise can also be made with different types of oils and flavored vinegars to give variations to its flavors.

### Eggless mayonnaise

Sl. no	Ingredients	Quantity
1	Skimmed milk powder	3 tbsp
2	Mustard powder	2 ¼ tsp
3	Pepper powder	Pinch
4	Lemon juice/ vinegar	1 tsp
5	Oil	2 tbsp
6	Salt	To taste

### Procedure

1. In a bowl mix milk powder, mustard powder, pepper powder and salt
2. Add one tbsp of warm water and mix well
3. Add oil drop by drop and keep whisking
4. As the mixture thickens add the lemon juice.
5. Keep on adding oil and keep on mixing.

## 3. Boiled dressing

It is an American innovation, has less fat and is not an emulsion, can be commercially purchased off the shelf and also used as a salad dressing and as spreads. Basic ingredients and the method of preparation is mentioned below:

Flour	Egg yolk beaten
Sugar	Milk
Mustard powder	Vinegar
Salt	Lemon juice
White pepper	Butter

### Procedure

1. Blend flour, sugar, mustard powder, salt and pepper
2. Beat the egg yolks, and add the above dry ingredients and whisk till smooth
3. Add milk and whisk well to blend.
4. Slowly add vinegar and lime juice.
5. Cook on a double boiler, on low heat, stirring till thick.
6. Remove from heat and whisk in the butter and cool it
7. It will thicken as it cools down.

NOTE- It has far less fat, replaced with flour and milk. This is a replacement for mayonnaise.

#### 4. Specialty sauce

- Cocktail sauce
- Barbeque sauce
- Marinara sauce
- Tomato Ketchup
- Worcestershire sauce
- Lemon sauce
- Tabasco sauce
- Grated horseradish sauce
- Cold English sauce
  - a) Cumberland sauce – red currant jelly + port + shallots + lemon zest and cook. Add dry mustard and cayenne pepper. Served with pork and venison
  - b) Cold Horseradish sauce- mustard powder + horseradish + sugar + salt + cream + vinegar + stabilizer- breadcrumbs.
  - c) Mint sauce- mint puree + sugar + vinegar
  - d) Oxford sauce- as for Cumberland sauce but orange zest is used instead of lemon zest.
  - e) Mustard sauce- Dijon mustard + vet oil +wine vinegar+ fresh dill+ sugar+ salt+ milled pepper.
  - f) Aioli- egg yolks+ garlic cloves+ Olive Oil + salt + white pepper.
- Sour Cream dressing- Blend onion ,lemon juice , salt, sugar and cayenne in a bowl. Incorporate the mixture into the sour cream and whisk till thick. Addition of pureed vegetables or fruit can also be done to the sour cream
- Yogurt Based dressing- Low fat or no fat yogurt + pureed fruit / vegetables , this can be quickly prepared.
- Yogurt honey dressing – yogurt + honey + lemon juice + salt + poppy seeds + stiffly beaten egg whites.

**The coulis:** Coulis are sauces made from fruit and vegetables.

- They have a long history but were almost forgotten or remained unused until now.
- They were revived with the advent of the plated service and new world cuisine.
- Sweet or sharp or a combination of the two.
- They can be served as a dipping sauce, dressing for cold or hot fish dishes, meat dishes, mousses and salads.
- Some are made sweeter by the addition of extra sugar and piped or ladled around sweets such as cakes, pancakes, gateau, cheese cakes or stewed fruit.
- They give extra flavor and useful contrast for modern plated presentations.
- Examples are asparagus coulis, apricot coulis, cucumber coulis, plum coulis, tomato coulis,

**Compound butter:** Are very useful addition to the flavoring and presentation of the dishes particularly in the case of grilled fish and meats, where they take the place of sauce.

- Parsley butter or beurre maitre d'hotel is the best known.

- They can be made as savory flavors or few with the addition of sugar or honey to be served with pancakes.
- Examples are dill butter, tarragon butter, mixed herb butter, anchovy butter, lemon butter, English mustard butter, French mustard butter, red wine butter.

**Dips:** A dip or dipping sauce is a common condiment for many types of food. Dips are used to add flavor to a food, such as pita bread, dumplings, crackers, cut-up raw vegetables, seafood, cubed pieces of meat and cheese, potato chips, tortilla chips, falafel, samosa, pakoras etc. Indian dips may include sonth chutney, mint chutney, mango chutney, raita etc. Unlike other sauces, instead of applying the sauce to the food, the food is typically put, dipped, or added into the dipping sauce (hence the name). Dips are commonly used for finger foods, appetizers, and other easily held foods. The dips are generally made with sauce (tartare sauce-a derivative of mayonnaise sauce acts as dip for fish fingers, or sonth chutney acts as a dip for samosa). Dips may be sweet or savoury or combination of both. Dip is a very widespread food. Forms of dip are eaten all over the world. All dips should have proper consistency so that it sticks to the meal and can be easily transferred to the mouth without dropping.

- ~ Some other popular dips are:
- ~ Ketchup- often used with French fries, onion rings, and a wide variety of other foods.
- ~ Barbecue sauce- a common sauce either tomato or mustard based, often used for grilled and fried meats, and French fries in the United States.
- ~ Chili con queso- a dip of melted cheese and chili peppers used in Tex Mex cuisine with tortilla chips.
- ~ Marinara sauce- a tomato sauce served with breadsticks, pizza, etc.
- ~ Salsa- a fresh or bottled sauce based on tomato, with various chilies, onions, and herbs. Used most often with tortilla chips.
- ~ Chocolate- a dip for various fruits, doughnuts, profiteroles and marshmallows.

#### **Storage and handling-**

- Commercial sauces can be stored like canned or bottled products. Once opened they should be refrigerated.
- Should be stored in plastic and glass containers and not metal as the acids will react with the metals.
- Ideal storage temperature is 34-40 degrees F.
- Mayonnaise does not freeze well. It will break when thawed.

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## **5.10 FORCEMEAT**

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Forcemeat is the basic element that constitutes the production of various charcutric products such as Sausages, Salami, Galantines, Ballotines, Timbale, and Quenelles and is also used as garnish of various cold products. Forcemeat is a mixture of ground, lean meat emulsified with fat. The emulsification can be accomplished by grinding, sieving, or pureeing the ingredients. The emulsification may either be smooth or coarse in texture, depending on the desired consistency of the final product. Proteins commonly used in the production of forcemeats include pork, fish (pike, trout, or salmon), seafood, game meats (venison, boar, or rabbit), and poultry, game birds, veal,

and pork livers. The name forcemeat is because the meat is forced through mincer and grinder to produce the emulsion.

**Composition of forcemeat**

Dominant meat	- 40%
Pork meat	- 30% (to give body and flavour)
Pork fat	-30% (to give moistness, flavor and richness)

**Basic procedure for preparing forcemeat**

1. Remove all fat, membranes, tendons, and tissues from meat.
2. Cut meat and fat into thin strips.
3. Add seasonings and flavorings bindings and the keep the meat chilling.
4. Chill the mincer along with the blades.
5. Put the poreer blades first and take out the mince chill both the meat and equipment for some time.
6. Pass the mince, seasoned time through a fine blade. Keep it for chilling, forcemeat is ready for use.

**TYPES OF FORCEMEAT**

<b>Straight type</b> 1 part dominant meat 1 part pork 1part pork fat	Galantines, sausage, salami (poached with internal temperature of 140 deg. F. and External temperature of 470 deg. F.)	Muslin. Cheesecloth, aluminum foils.
<b>Mousselline Type</b> 1 part egg 2 parts heavy cream 3 parts dominant meat	Terrines (poached at 175 deg. F. at internal temperature of 140 deg. F.) baked at 215 deg.F.	No line back is required.
<b>Country Style</b> 1 part dominant meat 1 part pork fat 1 part pork 1 part liver Binding-panada	Terrines (poached at 175 deg. F and baked at 275 deg. F.)	Line back fat is required.
<b>Gratin style</b> 1 part dominant meat 1 part pork fat 1 part pork All the ingredient is pre-cooked and coarsely grounded	Pate- short crust and puff pastry filed with forcemeat and baked at 375 deg. F. for 10-15 minutes and again baked at 275 deg. F for 40-45 minutes	Pastry mould
<b>Mousse Type</b> Cooked vegetables, meat, or liver etc+ gelatin/ Aspic + Veloute/ Mayonnaise + heavy cream	Various types of mousse (no cooking)	Set in moulds lined with coloured vegetables/ meat aspic, which can be de-moulded and cut.



**Seasonings and flavorings:** Various kinds of seasonings and flavorings such as pine nuts, mushrooms, pistachio, peppercorns etc can be added.

**Main seasonings are**

Yellow onions-	Spicy and sharp
Shallots-	Very aromatic and spicy
Scallions-	Very aromatic and mild
Red onion-	Mild
Garlic-	Highly aromatic and flavored

**Binding** – Potatoes, eggs whites, breadcrumbs, rice, panada.

**Texture-** Texture is basically is combination of minced forcemeat and coarsely grounded flavorings and seasonings, more over white preparing forcemeat, that is mincing, the most important thing that has to kept in mind that, machine along with blades in which minced has to be made should be properly chilled as the proteins and the natural albumen that is present in the meat will get coagulated and this will give a very low quality products, there are certain federal rules and regulations that are laid down by the forcemeat product producing countries.

Amount of water or ice present in the forcemeat should not exceed 3%. More water will produce a runny products and less water will result in uneven bindings in the product.

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### 5.10.1 CASINGS

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**Casings-** Casing or sausage casing is the material that encloses the filling of a sausage. Casings are typically divided into two categories, natural and artificial. Natural Sausage casings are basically made from intestines of pig, wild boar, hog, sheep and cattle intestines. These are washed and cured before use. The intestines are flushed clean especially from the inside and soaked in 10% solution of  $KMNO_4$  for a period of 2 hours at  $10^0C$ . Sausages are always made with fresh intestine, as these have flexibility in them. These Natural casings are made from the sub mucosa, a layer of the intestine that consists mainly of collagen. These intestines should be immediately used otherwise they toughen up and are susceptible to bacterial growth. They have shorter self life and cannot be procured in desired shape and size. More over nowadays it is very difficult to get large number of intestines and thus it has become a costly affair.

Advantages of natural intestines:

1. They are semi-porous and permit deeper smoke penetration.
2. They absorb flavour easily.
3. Generally they hold their shape better and do not burst easily during cooking.
4. They are totally edible and do not require peeling before eating.
5. They have natural colour and better appearance.

Dis-advantage of natural casing:

1. They are available only at slaughter houses
2. They have to be ordered in advance.
3. They should be treated immediately after slaughter of animal.
4. They cannot be made into different shapes and sizes.

Artificial intestine are those which are made in factories. These intestines are made of collagen, cellulose, or even plastic and may be edible or non edible. Artificial casings

from animal collagen can be edible, depending on the origin of the raw material. Artificial intestines are cheaper and can be made and purchased into desired shape and sizes. As they are artificially manufactured, they have longer shelf life and can handle higher temperatures. The collagen casings are made from hide of animals, where as cellulose casings are manufactured from husks, peel, skin and seeds of fruits and vegetables. Plastic casings are peeled away before consumption.

Advantages of artificial intestines:

1. They can be manufactured in required shapes, sizes and flavour.
2. They are much stringer and preferred for commercial purposes.
3. They are ideal for smoking purposes.
4. They can be stored for a longer time
5. They are clean, hygienic, cheap and easily available.

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## 5.10.2 SAUSAGES AND SALAMI

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### Sausages

A sausage is a food made from ground meat and often salt, herbs, and spices. The word sausage is derived from Old French saussiche, from the Latin word salsus, meaning salted. Typically, it is a mixture of minced meat, enclosed in a tube like casing. Sausages may be cured, air-dried, smoked, poached and pre-cooked.

### Types of Sausages

1. **Fresh raw sausages:** - These sausages require cooking by grilling, frying, poaching or boiling, or a combination of all or few. The meat may be of pork, beef, veal, mutton, poultry or offal's. They are seasoned with various herbs, flavorings, condiments and spices and bound with breadcrumbs or cereal. E.g. Chipolata, Cumberland (both British), Toulouse, Crepinettes (both French), Diots (small French country style), Chorizo (Mexican), Bratwurst (German), Luganega (Italian).
2. **Cured sausages:** - These sausages, generally raw, preserved by drying, salting or smoking. These methods give them characteristic aroma, texture and flavor. A good dry sausage is firm and has pronounced aroma, Cured sausages must be kept hanging in a cool place. E.g. Salami, Chorizo, Kabanos (Poland).
3. **Cooked and smoked sausages:** - Some sausages require part cooking or through reheating, by boiling or poaching. E.g. German Frankfurter, which is sold cooked and ready to eat. French Frankfurt is sold dried and smoked ready for poaching. Gendarmes are very dry, heavily smoked sausages from Switzerland and Austria-are eaten uncooked or cooked in stews.

### Salamis

Salami is cured sausage, fermented and air-dried meat, originating from one of a variety of animals. Varieties of salami are traditionally made in Italy, France, Hungary, Germany, Spain, Slovenia, Czech Republic, Belgium, Luxembourg, Greece, Romania, Bulgaria and Turkey.

The word salami, come from the Italian word salame, meaning 'salted meat'. The ingredients used for preparation of salamis are – the dominant meat, pork fat and pork meat, and also the preservatives and flavouring agents like salt, wine, spices, herbs, garlic, vinegar etc.

Few classical salamis-

1. Cacciatore (Cacciatora, Cacciatorini) "Hunter" salami from Italy
2. Salchichón from Spain

3. Téli Szalámi from Hungary
4. Westphalia- from England
5. Pepperoni- Italy

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### 5.10.3 PÂTÉ, TERRINE AND QUINELLES

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In French Pâté means paste, so Pâté is a mixture of ground meat and fat minced into a spreadable paste. Common additions include vegetables, herbs, spices, and wine. The term is applied to only to a dish consisting pastry case (shell) filled with meat, fish, vegetables or fruits, which is baked in the oven and served hot or cold. The English translation of this word is “pie”. When a pate is baked in a pastry shell (terrine), it is called pâté en terrine, where as when it is baked in crust as pie or loaf, it is called pâté en croûte.

The most famous pâté is probably pâté de foie gras, made from the fattened livers of geese. In the Netherlands, Finland, Germany, Hungary, Sweden and Austria, some liver pâtés are shaped as a soft, often spreadable sausage, called leverworst (Dutch) or Leberwurst (German). In the United States these are sometimes called "**Liverwurst**" (mixing English and German), or **Braunschweiger**. Pâté miason is a famous French Pâté made with chicken livers and pork sausage, wrapped in bacon, well seasoned with herbs and spices. Also known as "pâté (pate) champagne". preparation. The pâté is served on bread, often with dill or other fresh herbs.

**Pâté en terrine:** is a meat, fish game or fish preparation, with seasonings, spices and herbs and put into a dish (terrine) lined with bacon, cooked in the oven and served cold. Terrines are served at room temperatures. Terrine moulds were glazed earthenware (terracotta), cooking dish with vertical sides and a tightly fitting lid, generally rectangular or oval.

The mould is lined with bacon fat, and then filled with forcemeat. It is further covered with aspic jelly. The mould is then covered and then baked. After baking, it is de-moulded and cooled. It is then sliced and served.

### Quenelles

These are delicate dumplings made with spiced meat or fish force meat bound with fat and eggs and sometimes with panada added. It is then moulded into small sausages or egg shape with the help of spoon and poached in boiling water or court bouillon.

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### 5.10.4 GALANTINE AND BALLOTINES

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**Galantine:** Galantine is a French dish of de-boned stuffed meat, most commonly poultry, fish, game or suckling pig, that is poached and served cold, coated with aspic. Galantines are often stuffed with forcemeat of poultry, game, fish, pork, veal or rabbit mixed with eggs and spices, and pressed into a cylindrical shape. Galantines are poached in an aspic stock and served cold as an entrée.

#### Galantine de poulet:

**Stuffing:** Veal, pork, ham, pork fat, larding bacon, truffles, pistachios, spices, salt, pepper, brandy and eggs.

**Aspic stock:** Boil together for 1 ½ hours boned calf's feet, fresh pork skin, knuckle of veal, carrots, onion, leeks, bouquet garni with celery, Madera and seasoning.

Remove the bones of the chicken, by making a slit and working round the bony structure. On a piece of cloth place the deboned chicken place a layer of stuffing, placing strips of fat, bacon and nuts in between. Roll like sausages and tie the ends securely and poach in aspic stock.

Boil and simmer the galantine in the stock for 2 ½ -3 hours and remove. Unwrap the galantine, wash and clean the cloth and again wrap the galantine with it tying the ends. Keep under a slab for 15 hours to cool and to extract excess of stock from it. Galantines can be kept for several days if kept in cool place. It is served garnished in its own clarified jelly.

### Ballotines

These are generally small galantines made from small pieces of poultry, meat of fish that has been boned, stuffed and then rolled and tied into a bundle. The flesh is boned, stuffed and rolled, and tied up with string, usually wrapped in muslin cloth. Ballotines are covered with aspic and then sliced and then usually poached, baked, roasted or braised. They can be served hot or cold.

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## 5.10.5 BACON, GAMMON AND HAM

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**Bacon:** Bacon is obtained from the sides and back of a baconer (a pig reared and especially fed to yield bacon). In England, bacon means a side of pork partly boned, salted, cured and smoked. It is also found only salted or cured, and as such it is called “Green bacon” which is used very much the same as the smoked type. Smoked bacon is very popular and this is done in smoke chambers, where woods from beech, oak etc are burnt. This gives the bacon a distinctive taste and flavor. Smoking helps to preserve for a longer time. Bacons are fried, grilled or boiled.

**Gammons:** A gammon is always the hind leg of side bacon, whether it is green or smoked. The meat is cured and are mild, and do not keep long as true hams. They are suitable for boiling, braising and baking and may be served hot or cold. Gammons are cured while still on the side of the carcass.

**Ham:** Ham is always the hind leg of a side of pork and, preserved by curing or pickling in brine, then dried and smoked. Ham is prepared from fresh pork meat. A good ham should be plump, with ample fat under the rind.

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## 5.10.6 MOUSSE, MOUSSILINE AND FOI GRAS

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**Mousse:** It is a light soft preparation, either sweet or savory, in which the ingredients are whisked or blended and then folded together. Mousses are often set in a mould and usually served cold. Savoury mousses, served as horsd'oeuvres or entrée, may be based on, for example, fish, shell fish, poultry, ham, or a vegetable; sweet mousses are usually based on fruits or flavoring such as chocolate or coffee.

Example of savory mousses:

**1. Fish mousse:** Clean 500 gm of fillets of salmon or sole, pound them with a mortar, sprinkle salt and pepper, then blend in 2-3 egg whites, one after the other. Rub this forcemeat through a sieve and refrigerate for 2 hours. Then place a bowl of crushed ice and gradually add 600 ml of double cream, stirring the mixture with a wooden

spoon. Adjust the seasonings, pour the mousse in a buttered mould and poach gently in a double boiler in a oven at 195 deg. Centigrade for 20 minutes. Wait for 10 minutes before turning out and serve the mousse warm, coated with fish sauce.

**2.Chicken mousse:** Preparation is same as fish mousse, but use poached chicken meat and season the mixture well using curry powder and grated nutmeg. Serve coated with béarnaise sauce.

**Moussiline:** Any of the mousse like preparation, most of which have a large or small quantity of whipped cream added to them. This term is also used to small mousses or mousses cut into small pieces and served. Moussilines are served hot or cold. If cold they are also called small aspics.

**Foie gras:** Foie gras ( French for "fat liver") is a food product made of the liver of a duck or goose that has been specially fattened. This fattening is typically achieved through gavage (force-feeding) corn, according to French law, though outside of France it is occasionally produced using natural feeding. Foie gras is a popular and well-known delicacy in French cuisine. Its flavor is described as rich, buttery, and delicate, unlike that of an ordinary duck or goose liver. Foie gras is sold whole, or is prepared into mousse, parfait, or pâté, and may also be served as an accompaniment to another food item, such as steak. The technique of gavage dates as far back as 2500 BC, when the ancient Egyptians began keeping birds for food and deliberately fattened the birds through force-feeding. Today, France is by far the largest producer and consumer of foie-gras, though it is produced and consumed worldwide, particularly in other European nations, the United States, and the People's Republic of China. Each liver weighs approx. 700-900 gms. for geese and 300-400 gms. for duck. The colour ranges from ivory white to creamy to pink.

### Forms of foie gras

In France, foie gras exists in different, legally-defined presentations, from the expensive to the cheap.

- a. *Foie gras entier* (whole foie gras), made of one or two whole liver lobes; either cooked (*cuit*), semi-cooked (*mi-cuit*), or fresh (*frais*);
- b. *Foie gras*, made of pieces of livers reassembled together;
- c. *Bloc de foie gras*, a fully-cooked, molded block composed of 98% or more foie gras; if termed *avec morceaux* ("with pieces"), it must contain at least 50% foie gras pieces for goose, and 30% for duck

Foie gras are available in four forms.

- Fresh raw foie gras sold during Christmas
- Freshly cooked foie gras
- Semi cooked pasteurized foie gras available in cans.
- Preserved foie gras prepared in traditional ways, sterilized and preserved in its own fat.

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## 5.10.7 ASPIC, JELLY AND RED GLAZE

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**Aspic:** It is a clear translucent savory preparation, which solidifies on cooling because of the gelatinous substance it contains. It is a way of presenting cold food (meat,

poultry, shellfish, vegetables or even fruits), by setting it in moulded and decorated aspic jelly.

It is believed to have been derived from the word *aspis*, which means buckler or shield. It was in this form that the first forms of moulds were prepared. Today aspics are made in plain mould, charlotte moulds, savarins moulds or in individual ramekins or darioles. The type of aspic used varies according to the nature of the principle ingredients used. It is flavored with Port, Madeira, Marshala or sherry.

**Preparation of Aspic moulds and dishes:** Place the selected mould in the refrigerator until it is very cold. Prepare some aspic jelly (which has cooled but not set), turning it so that it coats the base and sides. Replace the mould in the refrigerator so that the aspic just sets but not too firm, and then place the items used for garnishing on the base and around the sides. The garnish (which should be chosen according to the principle item to go in the aspic), should be cut into small pieces; for example slices of truffle, slices of hard boiled eggs, sliced ham, tarragon leaves may be used. When adding these items, the appearance of the jelly when it is turned out of the mould must be considered. Replace the mould in the refrigerator to allow the garnish to set firmly. Then carefully fill the mould with the prepared filling and press it down into the jelly. The preparation may be placed in layers alternating with the layers of jelly, in which case, the jelly should be allowed to be set before the subsequent layer of prepared food is laid on top. Alternatively the mould can be filled with the prepared food then filled with jelly. Replace the filled mould in the refrigerator until the moment of serving. Unmould the firmly set aspic by plunging in boiling water. Turn upside down on a cold plate and replace in the refrigerator for a few moments before serving.

**Jelly:** It is a clear savoury jelly prepared from basic brown or white stock (meat, fish, poultry or game). It is produced naturally when stock is made from rich items in gelatin (veal knuckle, calf's foot, bacon rinds and fish trimmings), otherwise powder gelatin dissolved in water is added to the stock before it is clarified so as to make it transparent.

Aspic jellies are used in the preparation of aspics, terrines, as garnish to cold preparations and to glaze cold preparations.

Depending on their use, jellies may be colored using caramels, or edible carmine and flavored with wine or spirit (Madera, Port, Sherry, Brandy).

There are many types of aspic jellies each suited to a particular type of foodstuffs.

Eg. Ordinary /Meat Aspic jelly

- Roast 3 kg of knucklebones and 3-4 calves foot (blanched).
- Place in clean stockpot and boil ad then simmer for 2 hours. Skimming regularly.
- Add sliced vegetables (onions, carrots, leeks etc.), bouquet garni, and salt and pork rind.
- Simmer for another 2 hours, strain through muslin cloth.
- Add soaked gelatin and flavoring and color as required.
- Cool and use as required.

**Clarification:** Add fatless lean beef mince, egg whites, and lemon juice to the stock, boil and simmer for 15-20 minutes. Correct seasoning, strain through double muslin cloth and use.

White aspic is obtained in the similar way but here bones are not browned.

**Chicken Aspic (Gelee de volaille):** Is obtained by adding to the meat aspic either a whole chicken or chicken carcass and giblets, both browned in the oven.

To prepare 5 gallon of chicken aspic

Clear chicken stock----- 8 litre  
 Giblets & Carcass( light roasted---- 1 ½ kg  
 Salt----- 25 gm  
 Egg whites----- 6 nos  
 Gelatine----- 250 gm

Method:

- Cook stock and skim off fat. Dissolve gelatin in warm water.
- Mix egg whites in cold water .
- Add all the ingredients o thje sock and boil gradually.
- Lower heat and simmer for ½ hour.
- Strain through double muslin cloth

**Fish Aspic (Gelee Blanche de Poisson):** Prepare a strong fumet by putting in a stockpot 1 kg fish trimmings, 2 onions, 150 gm mushrooms, 2 shredded carrots and bouquet garni, boil and dissolved gelatin, strain. Flavor with champagne or sherry.

To prepare 5 gallons of fish aspic

White fish stock----- 5 litres  
 Egg whites----- 4 nos  
 Getlatin----- 200 gm  
 Salt----- 25 gm  
 Dry white wine----- ½ bottle

Method:

- Same as Chicken aspic

**Red Glaze:** This is a gelatin coating, which is put over pickled meats to protect the surface from the atmosphere, and prevents them from discoloring. This glaze must be firmer than aspic and will require 2-3 times more gelatin added to the stock. The colour should be reddish brown, obtained from brown sauce and edible red colour. The preparation is same as aspic. Salt beef, ox tongue, calf's head are coated with glaze.

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## 5.10.8 FOOD PRESERVATION

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The term food preservation refers to any one of a number of techniques used to prevent food from spoiling. It includes methods such as canning, pickling, drying and freeze-drying, irradiation, pasteurization, smoking, and the addition of chemical

additives. Food preservation is an important task to be carried out by the larder. The following are the main ingredients required for food preservation.

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### 5.10.8.1 BRINES, CURES MARINADES AND SMOKING

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**Brines:** It is a salt solution used to preserve meat, fish or vegetables. Brines sometimes also contain salt, saltpeter sugar and flavorings. Small items can be pickled in brine on a domestic scale, but large items come within the sphere of industrial salting. Brines for industrial use contain:

Salt	= 18 %
Sucrose	= 2-3 %
Sodium polyphosphates	= 80 %

Brines control the nitrate bacteria and gives pink color to ham or any other meat items.

Types of Brines: -

1. Raw brine	= water	= 10 litres
	= salt	= 2 ½ kg
	= saltpeter	= 25 gm
	= brown sugar	= 100 gm
2. Red brine	= water	= 10 litres
	= salt	= 2 ½ kg
	= saltpeter	= 50 gm
	= brown sugar	= 150 gm

**Methods of preparation: -**

Dissolve saltpeter in little water and place all ingredients in a cement or earthenware tub and mix until all the ingredients are completely dissolved. The important role played by salt is:-

Salt

The salt most commonly used is the common salt (NaCl) and saltpeter (NaNO<sub>3</sub> or KNO<sub>3</sub>). Salt changes foods, by drawing out water, blood and other impurities. In doing so, it preserves them, making them less susceptible to spoilage and rot. The important role played by salt is:-

- **Osmosis**- is the movement of water through a semi-permeable membrane, such as the cell walls of plant and animal, in order to equalize the concentrations of a solute (typically salt) on both sides of the membrane. This is known as osmotic pressure. Plant and animal cells contain relatively weak solutions of natural salts. Bacteria and other micro nutrients thrive in such solutions, drawing in nutrients through the cell walls. If however these cell walls are exposed to a strong salt solution the outward osmotic pressure created by the strong solution prevents them from feeding and thus from reproduction, there by their activity is inhibited and decay is prevented.
- **Dehydration:** The presence of „free“ water is one of the indicators of a food’s relative susceptibility to spoilage through microbial action. In order to increase the shelf life it is important to remove as much excess water as possible. Salt has a dehydrating effect on foods by attracting the free water and making it unavailable to microbes. Exposure to air or heat for controlled periods allows the water to evaporate, reducing the overall volume and weight of the food.
- **Fermentation:** Decay in foods is also caused by enzymes naturally present in foodstuff as well as by living micro-organisms. Salt stops all enzymatic action by upsetting the electrical balance of the liquid in which they act. The



strength of the salt solution is important. Some micro-organisms can tolerate strong solutions of salt. Among these are certain lactic acid producing bacteria, which, rather than causing decay, bring about beneficial fermentations. For this reason just the right amount of salt is used so as to kill all harmful pathogens and allowing these to grow. The lactic acid produced by these bacteria, itself safeguards it from bad bacteria. Eventually the acid becomes so concentrated that even these bacteria die and fermentation stops and the food keeps, however the food's flavour is changed.

- **Denaturing proteins:** salt inevitably changes the structure of proteins in food. Smooth foods become grainy and firm foods may soften.

**Sugar:** Ordinary white sugar and other forms of sugar, including corn syrup, honey, and maple sugar is used in some cures. Using less sweet forms of sugar, such as corn syrup and dextrose, provides the advantage of sugar without adding too much sweetness.

**Sweeteners are used for:-**

- Overcoming the harshness of salt in the cure.
- Balance the overall flavour.
- Counteract bitterness.
- Help stabilize colour in cured meats.
- Increase water retention in the finished product.
- Provide a good nutrient source for fermentation.

**Curing:** Is a method of preservation is very much related with the preserving with brine. Originally curing of meats was for the purpose of preserving by salting without refrigeration, but most cured meats of present have other ingredients added and are refrigerated, and many also are smoked and hence dried to some extent. The curing agents permitted are sugar, NaCl, saltpeter and vinegar, but only three are commonly used.

**Methods of curing:-**

- a) Dry cure- in which dry ingredients are rubbed into the meat, as in curing bacon.
- b) Pickle cure- in which meats are immersed in a solution of the above ingredients.
- c) Injection cure- in which a concentrated solution of the ingredients is injected by needles into the arteries and veins of the meat, as is done with pork hams.
- d) Direct addition- in which the curing agents are added directly to finely ground meat, such as sausage and aid in their preservation.

The curing temperatures, especially with a pickling solution, usually are about 2.2 – 3.3°C, and the time of the cure varies with the methods used and the meat to be cured. The older one of pickling methods require lots of time, but the newer quick one the pickling solution is pumped into the meat, greatly shortens that time.

**Function of curing**

Curing is done for the following reasons:-

- For fixing of colour so as to give meat a nice colour. The nitrous oxide obtained from reduction of nitrite reacts with haemoglobin and myoglobin to form nitric oxide haem or myoglobin, which upon heating or maturing is converted to the bright pink nitrosylmyochromogen.

- To alter and improve flavour.
- Provides antioxidant function.
- Provides protection from Clostridium Botulism.
- To retard the development of rancidity.
- To make the texture rougher.
- To improve shelf life.

**Marinades**

A seasoned liquid, cooked or uncooked, in which meat offals, game, fish or vegetables are steeped for varying length of time. Its principle purpose is to flavor the food, but it also makes certain meat tender by softening the fibers and enables fish and meat to be kept rather longer than would normally be possible. The length of marinating time depends upon the nature and size of the items and also on the external conditions, when the marinade is used for its preserving effect, the food should be completely submerged and not removed until required. Marinades may of cooked or uncooked types.

**Cooked marinades:**

Are used for meat and game. These marinades have advantage of keeping a very long time, provided they are kept in cool, dry place and boiled occasionally after 3-4 days by adding little wine or vinegar to improve the flavor.

**Uncooked marinades:**

These are ready made or instant used in marination of fish mainly or soft flesh birds.

Ingredients for making marinades

- Sliced onion - 100 gm
- Sliced carrots - 50 gm
- Garlic crushed - 1 clove
- Celery - 25 gm
- Parsley stalk - 20 gm
- Salt - 10 gm
- Peppercorns - 8-12 nos.
- Cloves - 1 no.
- Thyme - 2 sprigs
- Wine vinegar - ½ liter
- Oil - 200 ml

Method:

- Rub meat with salt.
- Place in a china or earthen dish.
- Sprinkle herbs, vegetables, and spices on top.
- Moisten with wine and oil.
- Keep in cool place for 24 to 72 hours.
- Turn meat frequently, so that it absorbs the flavor from all sides.

Difference between:

<b>Brines</b>	<b>Curing</b>	<b>Marinades</b>
Is solution of salt, sugar, and saltpeter	Is the method of preservation	Is solution of various kinds of vegetables, salt, vinegar and oil
Principle purpose is preservation of food item.	*****	Principle purpose is to flavor the food and make the flesh tender.

**Pellicle**

Before cured foods are smoked, they should be allowed to air dry long enough to form a tacky skin, known as pellicle. The pellicle plays a key role in producing excellent smoked items. It acts as a protective barrier for the food and also plays a role in capturing the smoke's flavour and colour. The exterior of the item must be sufficiently dry if smoke is to adhere.

**Smoking**

Smoking has been used as a way of drying and preserving food since prehistoric times. Smoking does have some preservative effects, but for modern cooking, it is more important for the flavours that it gives to meats, poultry and seafood. Even smoked chesses and vegetable are relished for their special flavours.

**Basic rules for smoking:-**

- Do not smoke meats, poultry and fish that have not been cured, without the preservative effects of curing, smoking could be unsafe.
- Foods must be air dried after curing and before smoking.
- In order to smoke foods a "Smoker" is necessary. The basic feature shared by each type of smoker is a smoke source, a smoke chamber where the food is exposed, circulation and ventilation.
- The wood used for smoking could be Hickory, Oak, Walnut, Chestnut, apple, wood from citrus trees, etc. In order to produce a rich, aromatic smoke soft woods must be avoided.
- In addition to various hardwoods other flammable materials like teas, herbs, stems, whole spices, corn husks, fruit peels and peanut shells, may be added. Wood must be free from oil or charcoal.

**Types of smoking:** There are two types of smoking; they are Cold smoking and Hot smoking. In cold smoking the temperature inside the smoke house is kept at or below 30 degree Celsius. At these temperatures, the food take on the flavour of the smoke but are not cooked.

In hot smoking the temperature in the smoke house may be as high as 90 degree C, for fish and poultry. These temperatures are high enough to cook the foods being smoked. Higher temperatures tend to cause excessive shrinkage. Foods may be hot smoked until they reach an internal temperature of 150 to 163 degree C, to ensure that they are fully cooked.

To summarize, the smoking process consists of the following steps:-

- Curing (dry or wet)
- Air drying
- Smoking (hot or cold).

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## 5.11 SEASONING

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Seasoning is the process of adding salt, herbs, or spices to food to enhance the flavor.

**1. Saline seasonings** – this type relies mostly on salt and thus it is salty in nature. The initial components of this may be normal salt, spiced salt, salt petre, malt vinegar, French vinegar, tarragon vinegar, white vinegar and lemon juice.

**Salt:** Salt is a mineral that is composed primarily of sodium chloride. Salt flavor is one of the basic tastes, making salt one of the oldest, most ubiquitous food seasonings. Salt for human consumption is produced in different forms: unrefined salt (such as sea salt), refined salt (table salt), and iodized salt. It is a crystalline solid, white, pale pink or light gray in color, normally obtained from sea water or rock deposits. Edible rock salts may be slightly grayish in color because of mineral content.

**Seasoned salt:** Seasoned salt is a blend of table salt, herbs, spices, other flavorings, and sometimes monosodium glutamate (MSG). Seasoned salt is often the standard seasoning on foods such as chicken, hot chips and deep fried seafood, or potatoes. Chicken salt, as sold in Australia and New Zealand, generally contains chicken extracts, which are listed as the second ingredient after salt. It is therefore not suitable for strict vegetarians. However, some flavored salts sold as chicken salt do not contain chicken extracts or concentrates. It is not related to the chicken flavorings or seasoning that is found on potato crisps, although it can be similar in appearance (both have a slight yellow coloring).

**Saltpeter:** Saltpeter or saltpeter may refer to Potassium nitrate, the critical oxidizing component of gun powder, and a food preservative.

#### Examples of saline seasoning:

- **Sambal Oelek** -This spicy, Southeast Asian paste that calls for fresh chillies, sugar, salt and often a potent dose of garlic stirs up big results even when added in small amounts. Sambal oelek can be a mixture of Thai chillies, garlic, sugar and salt blended.
- **Zaatar:** A staple in Lebanon, Israel, Syria and Jordan, Zaatar is the name of both a dry spice blend and the wild, eastern Mediterranean-grown thyme upon which most recipes for it are based. Lemony-tart powdered sumac and white sesame seeds are common components; variations include a range of additions from oregano to ground pistachios.

**2. Acid seasonings** – relies mostly on vinegar or citric juices. Citric acid is the same acid often found in citrus fruits, like lemons, limes and oranges. Plain vinegar aromatized with tarragon; verjuice, lemon and orange juice are few examples of acid seasonings.

**Vinegar:** Vinegar is an acidic liquid produced from the fermentation of ethanol in a process that yields its key ingredient, acetic acid (ethic acid). It also may come in a diluted form. The acetic acid concentration typically ranges from 4% to 8% by volume for table vinegar and up to 18% for pickling.

Natural vinegars also contain small amounts of tartaric acid, citric acid, and other acids. Vinegar has been used since ancient times and is an important element in European, Asian, and other cuisines.

**Tarragon:** Tarragon is a perennial herb related to wormwood.

**Verjuice:** Verjuice is a very acidic juice made by pressing Unripe grapes. Sometimes lemon or sorrel juice, herbs or spices are added to change the flavor. Nowadays grape wines are used instead of verjuice.

#### Examples of acid seasoning:

- vinaigrette- may be of the following types-
  - a. **French---** 3:1 vinegar and oil + salt and white pepper powder.
  - b. **English---** 2:1 vinegar and oil + salt and white pepper powder.
  - c. **American---** Equal quantity of oil and vinegar, salt and white pepper powder and sugar

- **Thousand island dressing-** 3:1 oil and vinegar + salt and white pepper powder + pimentos + tomato puree
- **Acidulated cream---** 4:1 cream and vinegar + salt and white pepper powder

**3. Hot seasonings** -relies on paprika, curry, cayenne pepper or pepper spices. Ginger, black cardamom, cinnamon and black pepper have long been used for heat in traditional Indian, Chinese cooking and other south Asian countries.

**Peppercorn:** Black pepper often takes on the name of the region where it was produced, or the port it was exported from. Malabar, Tellicherry, Singapore, Bangkok, Sarawak, and Belém are common examples of this. Three different kinds of peppercorns are produced by *Piper nigrum*: Black, white, and green.

**Paprika:** Paprika is a spice made from the grinding of dried fruits of *Capsicum annum* (e.g., bell peppers or chili peppers). Paprika can range from sweet (mild, not hot) to spicy (hot). Flavors also vary from country to country.

**Cayenne:** The cayenne pepper, also known as the Guinea spice, Cow Horn Pepper, alewa or bird pepper or, especially in its powdered form, red pepper is a hot, red chili pepper used to flavor dishes in Indian and Sichuan cuisine.

#### **Examples of hot seasonings:**

**Harissa:** Harissa, a fiery North African chile paste traditionally used as a condiment with couscous, begins with red chiles, garlic, cumin, coriander and caraway.

**Garam masala:** Means “hot spice.” In practice, though, it is not just a spice but a vast collection of permutations, each devised by Indian cooks who know intuitively how to blend complex flavors to create a desired effect for a preparation. The dried blend may include in varying proportions such spices as black peppercorns, cumin, coriander, fenugreek, cardamom, bay leaf and cloves. Dry roasts whole seeds and grinds them the day of service for fresh, intense bursts of flavor added to such items as lentil soup and yogurt marinade for chicken.

**Xacutti masala:** It is the specialty of Goa (region of west India on Malabar Coast) which includes coriander seeds, cumin, black peppercorns, fenugreek, and chili blended with coconut; roasted until black-red in color; fried to give a toasted nutty taste; used to give a dark color to cherries.

**Sambar masala:** A tart mixture consisting of toasted ground split-peas (arhar dal), coriander, cumin, black peppercorns, and fenugreek powder, sambar masala is an important component of vegetarian Brahman cooking. The spice mixture is most popular in southern India.

**Chaat masala:** A tart and salty spice blend that’s most prominent tone derives from amchoor - a sharp, lemony seasoning from ground, dried, unripe mangoes. Typical elements of chaat include ground asafetida, mint, ginger, caraway, cayenne, black salt, black pepper, cumin, coriander, and dried pomegranate seeds.

**4. Saccharine seasonings** -relies on sugar and honey or any other sweet syrup.

**Sugar:** Sugar is an informal term for a class of edible crystalline substances, mainly sucrose, lactose, and fructose characterized by a sweet flavor. In food, sugar almost exclusively refers to sucrose, which primarily comes from sugar cane and sugar beet.

**Honey:** Honey is a sweet food made by honey bees using nectar from flowers. The variety produced by honey bees is the one most commonly referred to and is the type of honey collected by beekeepers and consumed by humans.

Examples of sweet/saccharine seasoning:

- a. **Plum sauce-** plum juice + sugar syrup

b. **Apricot sauce**- apricot puree + honey

### Selection and Storage

- Whenever possible, choose fresh seasoning over the dried form of the herb since it is superior in flavor. The leaves of fresh sage should look fresh and be a vibrant green-gray in color. They should be free from dark spots or yellowing.
- Even though dried herbs and spices like seasoning are widely available in supermarkets, you may want to explore the local spice stores in your area. Oftentimes, these stores feature an expansive selection of dried herbs and spices that are of superior quality and freshness compared to those offered in regular markets.
- Just like with other dried spices, when purchasing dried sage, try to select organically grown sage since this will give you more assurance that it has not been irradiated (among other potential adverse effects, irradiating sage may lead to a significant decrease in its vitamin C and carotenoid content.)
- To store fresh seasoning leaves, carefully wrap them in a damp paper towel and place inside a loosely closed plastic bag. Store in the refrigerator where it should keep fresh for several days. Dried sage should be kept in a tightly sealed glass container in a cool, dark and dry place where it will keep fresh for about six months.

**Tips for using seasonings:** Since the flavor of seasoning is very delicate, it is best to add the herb near the end of the cooking process so that it will retain its maximum essence.

A Few Quick Serving Ideas:

- Mix cooked navy beans with olive oil, sage and garlic and serve on brochette.
- Use sage as a seasoning for tomato sauce.
- Add fresh sage to omelets and frittatas.
- Sprinkle some seasoning on top of your next slice of pizza.
- Combine seasoning leaves, bell peppers, cucumbers and sweet onions with plain yogurt for an easy to prepare, refreshing salad.
- When baking chicken or fish in parchment paper, place some fresh seasoning leaves inside so that the food will absorb the flavors of this wonderful herb.

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## 5.12 SANDWICHES

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Sandwich is a type of food item made of generally two or more slices of bread pieces with one or more layers of meat, seafood, vegetables, cheese or jam and butter. The bread is been lapped by butter, oil, mayonnaise or any other sauces. The breads are stacked nicely and neatly, resting on a crust of bread. They are then buttered and prepared fillings are added, so the complete loaf is made into long sandwiches. The sandwiches are then wrapped in greaseproof paper or foil. It has to be always noted that raw bread sandwiches are served with their crust cut off, while toasted bread sandwiches are served with their crust. Sandwiches are eaten as quick meal as snacks, as breakfast item or as a separate full meal course. It can be eaten hot or cold. The accompaniments which generally follow sandwiches are tomato sauce, French fries, potato chips or crisp pickle and coleslaw. In some sandwiches thin wafers, biscuits or cookies instead of bread. E.g ice cream sandwiches.

**Sandwich fillings**

Any type of food material can be used for filling for sandwich, but the most common fillings include in almost every sandwich are cucumber, tomato, onions, boiled or fried eggs, cooked or roasted chicken or meat, ham, tongue, smoked salmon etc. Cooked fillings like nuggets of vegetables, paneer, cheese, meat and even fish and shellfish are also used. Sweet sandwiches have jam, jellies, fruit pulp, chocolate sauce, ice creams or sweets as filling.

**Parts of Sandwich**

Sandwiches comprises of three parts namely

1. Base
2. Spread
3. Body and
4. Garnish

**1. Base-** may be made of any type of plain white bread. Bread which is one day older is considered as the best for making sandwiches. Pullman or sandwich loafs of white bread are most frequently used. Apart from breads, burger buns, brown or French loaf or rolls, toasted or fresh can be also used as the base. Bases provide a structure to the sandwich and helps in holding the fillings. The other types of breads used for making sandwiches are:

Name	Country	Features
Ciabatta (Slipper)	Italy	Leavened, uses a natural starter, crusty texture
Focaccia	Italy	Leavened, aromatic, comes in various variations
Baguette	France	Leavened, crispy crust uses steam in baking.
Bagels	Eastern Europe	Leavened, soft, poached in water before baking
Pretzels	Germany	Crispy texture, use caustic soda for colour, can be made in various shapes
Stollen (Christ cake)	Germany	Festive bread, sweet to taste, very rich, usually filled with marzipan
German Rye bread	Germany	Leavened, uses natural starter, rye flour is used.
Lavash	Middle east	Very thin, eaten as accompaniments with various dips, comes in varied flavours

**2. Spreads-** different types of spreads can be used depending upon one's choice and availability; the recommended spreads may be butter, ghee, margarine, cream, tomato sauce, mayonnaise, curd. The spreading is done to keep the bread and its fillings moist and soft and enhance the flavor and nutrients.

**3. Body-** the body of sandwich is the main fillers used and after which the sandwich gets its name. This is also called filling and may be of beef, chicken, meat, fish, eggs, shellfish, cheese or vegetables or combination of two, three or more ingredients. But remember that all the ingredients must be in slices, shredded, minced or cut small and bound together with butter or mayonnaise.

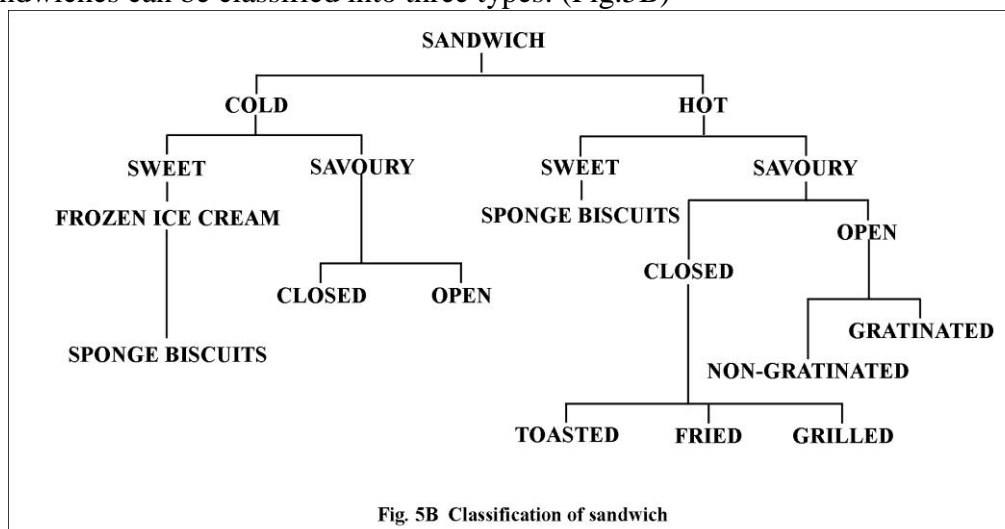
**4. Garnish-** garnish provides a contrast to the sandwich other than giving a peculiar taste, flavour and aroma. It has always to be remembered that garnishes should be small, petite, dainty and eye appeal.

Essentials of preparation of sandwiches:

1. Use one-day-old bread for better cutting.
2. Always prefer breads with close fine texture and thin slices.
3. Apply even layer of spreading.
4. Remove and may not remove the crust.
5. Use right amount of fillings of different colors, textures and flavors. There should be no too much moisture, as they will result in making the sandwich soggy.
6. Use salt, pepper powder and mustard powder as seasonings.
7. Wrap the sandwiches properly.
8. Edges should be cut neatly if required.
9. Store at 40 deg. F for 12 – 24 hours.

### Classification of sandwiches

Sandwiches can be classified into three types: (Fig.5B)



**A. Cold sandwiches:** These sandwiches are prepared cold and served cold. All the ingredients used in these types of sandwiches are of cool in nature. Cold sandwiches are the most widely eaten sandwiches in the world. They are usually served with cold sauces and potato chips.

- **Open sandwich-** Open sandwiches make use of only one kind of bread with the filling on top. The slices of white bread can be cut into squares, triangles or rounds. Butter is spread lightly on top and pieces of vegetables, cheese or meat fillings are placed on top. They may be garnished with slices of carrots, raisins, pickles and the like to make them more attractive. Open sandwiches are similar to canapés which make use of biscuits, cookies or toasts instead of using breads. (Fig. 5C)



Examples:

Smorgasbord is a specialty of Sweden and Denmark, having fancy shapes, easy to prepare, eye appealing, low cost, lots of flavors and where left-over can be used. Slowly all the Scandinavian countries adopted this type of sandwich. The choice



of fillings and decoration are endless and the arrangement on the buffet table is very important. Open sandwiches may be large, medium or small.

Examples of some open sandwiches with their toppings:

- Copenhagener- Danish blue cheese, with raw egg yolk and raw onion rings.
- Harlequin- Meat, potato and radish.
- Roulette- Cods roe, Russian salad, tomato, cucumber, gherkins etc.
- Sunshine Salami- sliced salami with raw egg yolk in raw onion rings.
- Guardsman- Briskets of beef, hors-radish, cream, onion, tomato and parsley.

➤ **Closed sandwich**- in these types of sandwiches, the fillings is closed between two slices of bread. Closed sandwiches are widely eaten. They may be of many kinds like:

a. **Plain Sandwiches**- A plain sandwich is made up of two slices of bread, preferably day-old bread, toasted if desired, and on which butter can be readily spread. Its crusts may or may not be removed, depending upon your preference. Butter, mayonnaise or a prepared sandwich spread may be used as lining to prevent the bread from absorbing moisture from the filling. Besides preventing the bread from becoming soggy, the spread also adds flavor and nutrients. Moreover, it ensures that the bread and the filling will stick together.( Fig. 5D)



Fig.5 D Plain Sandwich

b. **Pinwheels Sandwiches**-Pinwheels are made of cream bread cut lengthwise, about 3/8 inch thick. Fresh cream bread is preferable because they are easy to roll and will not crack. Trim crusts and flatten long slices with rolling pin. Spread bread with softened butter or margarine and your choice of any smooth filling, like creamed cheese, marmalades, cheese pimienta, peanut butter, jams and jellies. Smooth filling are ideal for pinwheel sandwiches, because they do not have bulk and can be spread thinly. Place sweet pickles or several stuffed olives at the end of slice. Roll up bread like a jelly roll. Wrap each rolled sandwich individually and chill for several hours or until they are firm. When ready to serve, unwrap the rolled sandwiches and cut into 1/2 inch slices. Use a sharp knife or a bread knife so the sandwiches are cut clear and neat. Arrange and serve them on a platter. Garnish if needed.(Fig. 5E)



Fig.5E Pinwheel sandwich



Fig.5F Sandwich cake

c. **Sandwich cake**- these are multi-layered sandwich in which round loaf is used and soft fillings are used. These type of sandwiches are very much liked by children and is a favourite



Fig. 5G Loaf Sandwich

birthdays. The sandwich is nicely garnished and presented. The most common cake sandwiches are sweet in nature. They are cut into wedges like cake and served (Fig. 5F).

- d. **Loaf sandwiches**- these are long loafs which are sliced and prepared like cake sandwich. In this French loaf is generally used. (Fig. 5G).



Fig.5H Ribbon sandwich

- e. **Ribbon sandwich**- In these two slices of bread of different variety and color is used. The fillings also have contrasting colors. This sandwich is cut into thin strips and served. The coloured breads may be chocolate, spinach, vanilla, orange etc.(Fig 5H)



Fig. 5I Double Decker Sandwich

- f. **Double Decker sandwich**- In these three slices of bread is used with fillings placed in between. They are pressed, sides trimmed and firmly held with cocktail sticks with stuffed olives or cherries.( Fig. 5I)



Fig.5 J Bookmaker sandwich

- g. **Bookmaker sandwich**- this is buttered roll or French bread spread with French mustard and grilled steak in between.( Fig 5J)

## B. Hot Sandwiches:

There are three primary characteristics of hot sandwiches:

- (1) It must be hot.
- (2) They must remain hot throughout the services
- (3) Hot sandwiches can have a hot sauce as an accompaniment.
- (4) Hot sandwiches don't have their crust trimmed off.



Fig.5L Hot Dog

- a. **Open Hot sandwiches**- Open hot sandwich are prepared with bread or toast laid side by side with the filling exposed on the surface. Sandwich is then heated throughout. It can be subdivided into grilled and meat combination. Examples are open faced frilled grilled cheese, tuna melt and hot brown sliced turkey, bacon and tomato topped with cheese sauce and heated.



Fig. 5K Multi decker Sandwich

- b. **Multi Decker Hot Closed Sandwich**- More than two slices of toasted bread or a roll split more than once and toasted. They also have several filling. Club

sandwich is a classic example. It is composed of three pieces of toasted bread, bacon, lettuce, tomato and turkey filling the toast is spread with mayonnaise and layered every with two levels of fillings. The sandwich is cut in quarters and normally toothpick with a fancy pick. (Fig. 5K)



Fig. 5M Hamburger

- c. **Hot Dog-** This is a sausage serve on a special roll. It can be accompanied or topped with a hot topping such as chili or cheese sauce or with cold topping coleslaw, sauerkraut. It is often accompanied with relish, relish, chopped onions and other condiments. Most specially ketchup and mustard. In India hot dogs have lettuce, vegetable or meat nugget or cheese fillings and served nicely secured by toothpick. (Fig 5L).



Fig. 5N grilled sandwich

- d. **Ham Burger-**Most popular sandwich in the world. 2-6 is obtuse if ground beef, broiled, fried or grilled to order served on a round bun with lettuce. Tomato and onion garnish and the appropriate condiments. A basic variation of the burger is the meeting of a slice of American cheese on top called cheese burger. (Fig. 5M).
- e. **Grilled Sandwiches-** Two slices of bread encasing a filling. The casing is buttered on the outside top and bottom and then placed on a grilled or in a pan to brown on both sides. A grilled cheese sandwich is an excellent example. The browned outside is dry yet malted cheese inside is wet. The crunchy exterior of the sandwich is accentuated (enhanced) by the smooth interior. A light weight can be put on top of the sandwich during grilling to enhance the browning. (Fig.5 N).
- f. **Fried Closed sandwich-** Are two pieces of some type of filling which has been dipped in an egg mixture and then deep or pan fried till golden. They are after finished in the oven to ensure that the interior is hot. Common example is Monte Carlo, Mante Christo. Monte Christo is normally prepare with Swiss cheese, ham, Dijon mustard or a light bread accompanied by red currant jelly.
- g. In this type of sandwiches, two toasted slices of breads are used. The fillings may be smoked salmon, shredded lettuce, hard boiled eggs. The spread used is always mayonnaise.


### C. Tea sandwiches

Do not fit exactly in other categories because they are fancy, light delicate. They can be open, closed, rolled and cut and occasionally served got use to impress guest with their beauty. Pastel green and pink coloured breads are often used and the sandwiches are always small. They arrange in assortment of trays and plates and passed on or serve buffet style. (Fig. 5O)



Fig. 5O Tea sandwich

### Some famous Classical sandwiches of the world

1. **Submarine-** This extremely popular sandwich is also called “Hero”. The sub is a king-sized sandwich on an Italian loaf of bread approximately 12 inches long and 3 inches wide. It is filled with ham, salami, cheese, lettuce, tomatoes, onions, and usually flavored with garlic powder and oregano. It is thought that the original concept of these sandwiches came from the Italians who immigrated to New York in the late 1800s and brought with them their favorite Italian sandwich recipes. It is related to the Poor Boy, the Hero and the Hoagie. They are all made on full loaves of crusty French bread filled with various cold cuts and many different trimmings.(Fig. 5P)
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2. **BLT** (bacon, lettuce, tomatoes) sandwich- is combination closed cold sandwich. The sandwich traditionally has several strips of cooked bacon, leaves of lettuce (traditionally iceberg or romaine), and slices of tomato, all sandwiched between slices of bread, optionally toasted. Mayonnaise is the traditional condiment used.
  3. **Mosaic Sandwiches-** An alternate color of slices of bread is preferable for this type of sandwich. The initial step is similar to that of the ribbon sandwiches, 'Press together stack of slices and then trim crusts. Wrap and chill for several hours. Cut about 1/2 inch wide. Spread cut sides of ribbons with fillings. Stack 3 ribbon sandwiches so that green and pink sections alternate. Wrap and chill for several hours. Slice about 1/2 inch thick into checkerboard sandwiches immediately after removing from refrigerator. These are sometimes called checkerboard sandwiches because of the alternate squares of green and pink bread.
  4. **Ice cream sandwich-** consists of a layer of ice cream between two layers of cake or cookie.
  5. **Runza-**This is a specialty from Nebraska, similar to the Bierock mentioned above. It also has its roots in the German and Russian, and is a yeasted pocket bread stuffed with beef, sauerkraut, onion and seasonings.
  6. **Bierock-** This is a specialty from Kansas with roots in the German and Russian. A yeasted pocket bread would be stuffed with beef, sauerkraut, onion and seasonings. It is similar to the Runza.
  7. **Cuban Sandwich-**Toasted Cuban sandwiches are Miami's favorite snack. The best places to buy them are from street corner-snack bars called Loncherias. The sandwiches have a submarine-style layering of ham, roast pork, cheese, and pickle between sliced lengths of Cuban bread. Cuban sandwich shops make these sandwiches using a sandwich iron similar to a Panini press.
  8. **Dagwood Sandwich-**This sandwich is named after the popular comic strip character of the 1930's, Dagwood Bumstead. Rather inept in any domestic duty, Dagwood was only able to pile leftovers between bread. Yes, go ahead and clean the fridge and call it a Dagwood, but remember to pile high enough to make it impossible to eat.

- 9. Falafel-**Falafel is the national street food of Israel and the whole Middle East. It is served in a pita, dressed with Tahini sauce and smothered in a variety of add-ons. One may find chopped salad, pickled vegetables, even the fiery Yemenite condiment called zhug. Every Falafel stand has its own style. Some people love it topped with sauerkraut, wedges of tomato and Tahini. Hot pepper may also be sprinkled on top.( Fig. 5Q)

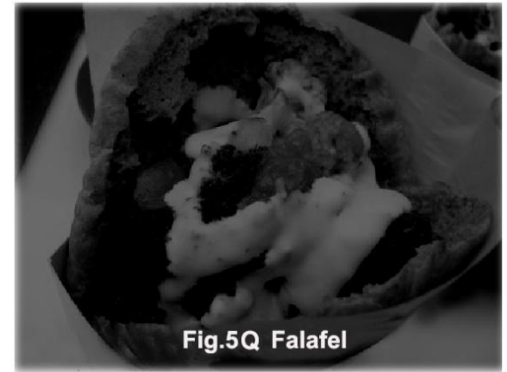


Fig.5Q Falafel

- 10. Hoagie-**The hoagie comes from Philadelphia and has developed several legends as to its origins, but the word 'hoagie' seems to have derived from 'hoggie' (an apt term for anyone downing this supersize sandwich). A site member advises us that "The term "Hoagie" refers to the men who worked on Hog Island. Hog Island was famous for shipbuilding. The shipbuilders liked their sandwiches big and local shopkeepers accommodated by creating a Sandwich which would satisfy their appetites. A correctly made Philadelphia Hoagie has some of the soft interior of the bread removed, to accommodate more ingredients.

- 11. Horseshoe-**This is a specialty in Springfield, Illinois, and is a thick sandwich with two or three slices of bread encasing fried ham steak or 2 large hamburgers. It is served with thick French fries, and a special sauce. A 'Pony Shoe' uses one slice of very thick bread.

- 12. Monte Cristo-**The Monte Cristo Sandwich has creative variations from one restaurant to another. The basic sandwich is made of two slices of white bread with ham, turkey, or chicken, and a slice of cheese. It is then dipped in beaten egg and fried in butter. A classic Monte Cristo sandwich should come with a side of jelly to dip it in. The original grilled cheese sandwich, this consisted of Gruyere cheese and lean ham between two slices of crustless bread slices.( Fig.5R)



Fig.5R Monto Cristo sandwich

- 13. Muffuletta-**The Muffuletta is a specialty of the French Quarter of New Orleans. It could be called olive salad on bread. Despite the name 'French' this is a gift of the Italian immigrants who settled in New Orleans. To be authentic, it should be served on a round 10-inch roll, at room temperature. It is frequently called simply 'Muff.' bread, fried in clarified butter. It was originally served in 1910 in a Paris cafe. This sandwich is still a popular snack or casual meal throughout France and Switzerland in most bars and cafes.

- 14. Poor Boy (or Po' Boy)-**The Po' Boy or Poor Boy emanates from New Orleans. The fillings vary, ranging from fried oysters, shrimp, fish, soft-shelled crabs, crawfish, roast beef and gravy, roast pork, meatballs, smoked sausage and more. They are always made with French bread. It is related to the Hoagie, the Hero and

the Submarine. They are all made on full loaves of crusty French bread filled with various cold cuts and many different trimmings.

**15. Reuben Sandwich**-The Reuben Sandwich is a grilled sandwich made with corned beef, Swiss cheese, sauerkraut, and Russian dressing on rye bread. There are two claims to the Reuben. The Midwestern claim states that it was created by Reuben Kolakofsky (1874-1960), a wholesale grocer in Omaha, Nebraska and co-owner of Central Market in Omaha sometime between 1920 and 1935. Like the Earl of Sandwich at his gaming tables, Kolakofsky belonged to a weekly poker group for whom he fixed this sandwich. One of the players, Charles Schimmel, was owner of the Blackstone Hotel in Omaha, and he put the Reuben on his menu.

**16. Sweet Sandwich**-prepared with thin slices of stale Brioche and filled with chopped fruits or jam or thick sweet custard.

### **Making sandwiches**

The preparation of sandwiches requires lots of hand work and individual motion should be of competency while making them, especially multi-decker or those have multiple numbers of ingredients. Whether you are making it in quantity to order, your goal must be reduced to your motions to make the production as efficient and as quick as possible.

#### **Setting up work station for preparing sandwiches:**

Setup for preparation of sandwiches depends upon the type of menu, and the quantity of sandwiches to be produced. Every setup involves basic two elements: Ingredients and equipments

#### **1. Ingredients**

This phase has two parts;

1. Preparation of ingredients; mixing, prepare spreads, slice vegetables, cheese and meats, prepare the base ingredients prepare garnishes and so on. In other words do the mis-en place.
2. Arrange or store the ingredients; this should be done with utmost care and precautions to be taken to move the ingredients to minimum. Store every ingredient separately at convenient place and to easy reach or at close proximity. Remember while making sandwiches both the hands should work accordingly. Like one hand picks up the bread, the other puts up the spread on it, then the first hand works upon the fillings and so on. Remember on a busy sandwich station, every second counts.

One more thing that has to be considered is hygiene and sanitation of the work place and proper portion control. Any unused ingredients should be stored appropriately in proper place.

#### **2. Equipments**

The equipments needed for a sandwich section depends, of course on the menu and the size of the operation.

a) Storage equipments- for ingredients include refrigeration equipments for cold equipments like refrigerators, reach in etc, and a steam table for hot ingredients such as roast meats. Moreover few small containers for storing seasonings, sauces and gravies are also required.

- b) Hand tools are the basic requirements for sandwiches making and are often the only tool necessary. These include spreaders, spatulas and knives such as serrated knife and sharp chef's knife for cutting the finished sandwiches. The cutting board should be absolutely clean and odourless and preferably white in colour.
- c) Portion control equipments include scoops, for filling and portion scales for other ingredients.
- d) Cooking equipments is necessary for most of hot sandwiches. Griddles, grills, broilers, and deep fryers are used for cooking sandwich ingredients to order. Microwave ovens are sometimes used to heat ingredients or finished sandwiches.
- e) Working table assembly to actually assemble the sandwiches and portioning.

#### Procedure of making simple sandwiches in quantity

1. Prepare and assemble all ingredients.
2. Assemble necessary equipments, including wrapping materials.
3. Arrange bread slices in rows on the table.
4. Spread each slice with the required spreads.
5. Place the fillings evenly and neatly on alternate slices, leaving the other slices plain. Fillings should not hang over the edge of the bread.
6. Top the filled slices with the plain butters slices.
7. Stack two or three sandwiches.
8. If the sandwich is made plain one, then cut off the brown edges before service.
9. Hold firmly from the top and cut with a sharp knife and cut off the edges and then cut into desired shape (grilled sandwiches or toasted ones do not require edge cutting). Club sandwiches are cut into four and then served. (Fig.5S)
10. Wrap properly in cling foil or sandwich bag, cover with clean damp cloth and store in storage pans and put in cool place in refrigerators.

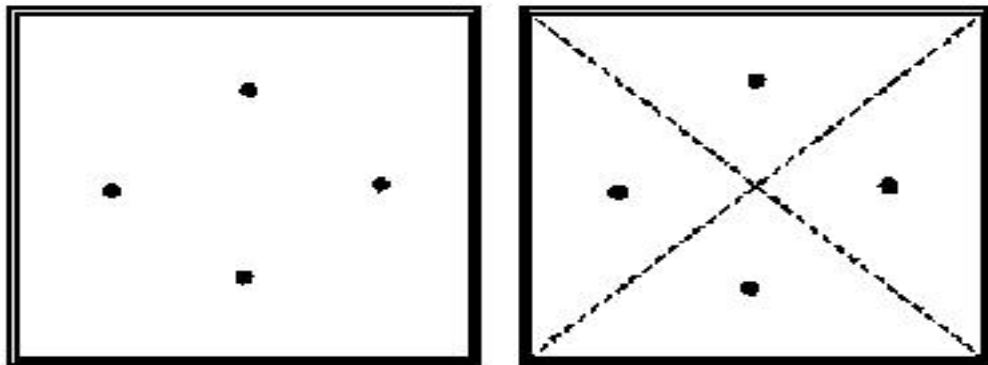


Fig. 5S cutting a sandwich

#### Storage of sandwiches

Sandwiches should be prepared and served just before service, but, if has to be prepared in advance by chance, then extreme precautions to be taken to store them. Salt present in the sandwich fillings destroys the cells of the greens used, thus making the sandwich and canapés soggy. The following precautions to be taken while storing them:

1. Arrange the sandwiches on platters or trays giving space between them.
2. Sandwiches should not be stored for more than one hour of preparation.
3. Sandwiches should always stored in clean dry and sanitized trays or containers

4. Cover the sandwiches in cling foil and store it in cool temperature in the refrigerator.
5. Do not pack the accompaniments (French fries or chips) with the sandwiches and canapés as, these will become soggy.
6. Hot sandwiches should be cooled and then stored.
7. Do not store very near smelly items like onions, garlic, fish, spices etc.
8. Garnishes should always be removed before storing sandwiches.
9. Sandwiches should not be stacked upon one another while storing.
10. Extreme cool should be avoided as this will tighten the bread slices.

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**CHECK YOUR PROGRESS-II**

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**Q. 1 What are the parts of Canapé?**

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**Q2. What is Piroshki?**

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**Q3. What do you mean by dips?**

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**5.13 SUMMARY**

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The word larder came from the word LARD meaning pork (pig) fat. The name was given to the place in kitchen used as the cold storage for perishable items like meat, fish, poultry, eggs and milk. It is a department set aside for the storage of both raw and cooked and where food stuffs such as meat fish poultry and game are prepared and made ready for cooking.

In this department all cold food items found on the menu such as Hors d'oeuvre cold fish or meat dishes, cold sauces, salad dressings are prepared and dressed. One particular special duty of this department is the preparation and presentation of all types of cold buffet, which are nowadays a feature of so many functions.

This department is also known as “Gar de Manger” meaning “station of eatery”. In the larder kitchen, the work is broken down into various fields such as Hors d'oeuvre, Salads, Butchery, Poultry, Cold Buffet etc, and in effect, in large busy establishments each of these functions or duties are carried out by one or more men, who specialize in the work of that particular sub-department. These various duties are



allocated by the Chef Grade Manager, who is in overall charge of the department, to commis or assistant chefs, and they are known as Commis Grade-Manager, whatever duties they are assigned to. Naturally, the busier the establishment, the more Larder work it entails, therefore more is required to man the department. The smaller the volume of trade the fewer commis required, and so on. In many establishments the Chef Grade-Manager is single handed and carries out all the various functions himself. The focus of this kitchen is more on quality rather than quantity.

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## 5.14 GLOSSARY

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**Salamander**- a heavy electrical equipments with coils on ceiling used for grilling or toasting many foodstuffs for making savouries and canapés and for grilling sausages etc.

**Quick freezing**- This is the technique wherein the temperature of the food is brought down to the required level, in the shortest possible time, to decrease the growth of the bacteria.

**Ramequins**- Small, round straight sided soufflé dishes 8-10 cm in diameter made up of oven proof glass in which variety of eggs and cheese dishes are cooked.

**Bouchees**- Small puff pastry patties of various shapes filled with purees, ragouts and mince etc. They are served as appetizers.

**Kremoskies**- same as croquettes but dipped in yeast batter and deep-fried.

**Cocktails**- The term cocktails is used not only for alcoholic beverages and vegetable and fruit juices, but also for a group of appetizers made of selected sea food or fruits, usually with a tart or tangy sauce.

**Rohan**- is a garnish for braised or sautéed poultry, consisting of artichokes hearts topped with slices of foie grass and truffle, arranged alternatively with tartlets filled with cocks kidneys in supreme sauce.

**Coulis** - are sauces made from fruit and vegetables.

**Salami**- is cured sausage, fermented and air-dried meat, originating from one of a variety of animals.

**Gammons**- A gammon is always the hind leg of side bacon, whether it is green or smoked.

**Brines**- It is a salt solution used to preserve meat, fish or vegetables.

**Osmosis**- a process by which molecules of a solvent tend to pass through a semipermeable membrane from a less concentrated solution into a more concentrated one.

**Pellicle**- Before cured foods are smoked, they should be allowed to air dry long enough to form a tacky skin, known as pellicle.

**Lavash**- Very thin, eaten as accompaniments with various dips, comes in varied flavours, a delicacy sandwich from middle east.

**BLT**- (bacon, lettuce, tomatoes) sandwich- is combination closed cold sandwich.

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## CHECK YOUR PROGRESS-I ANSWERS

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1. The attributes of the larder department are:
  - The larder be separated from the kitchen and located in a cool place. At the same time, it must be close to the kitchen to avoid undue running about between the departments which are closely interrelated.

- It should be light, airy and well established and sufficiently spacious to allow the staff to carry out their duties in a clean and efficient manner.
  - It must also be able to store prepared foods and buffets in a cool and hygienic manner.
  - It should be equipped with the necessary fitting, machinery and tools. In accordance with the volume and/or quality of the trade of the catering establishment in which it is situated.
2. The functions of slicing machine are:
- Is used for cutting slices of cooked meats such as ham or tongue, or any other boneless joints of meat.
  - It is also used for cutting bacon or gammon rashers.
  - A calibrated scale is fitted to determine the thickness of the slices.
  - They may be hand-operated, semi-automated or fully automatic.
  - The cleaning of the machine should be done carefully following the instructions on the manual. No food should be left clinging to the parts which cannot be removed for cleaning as the bacterial growth will occur.
  - The blades should be kept sharp always using the grindstone attachment provided along.
  - The machine should be kept lubricated with the oil provided.
3. Quick freezing
- a) This is the technique wherein the temperature of the food is brought down to the required level, in the shortest possible time, to decrease the growth of the bacteria.
  - b) The food is brought to the point when there is an ice formation in the cells of the food.
  - c) It is of greatest importance that this stage be passed through as quickly as possible, because the longer it takes for the ice to form, in the intercellular structure, the larger will be the ice crystals and this will make the cellular structure to rupture and collapse. This will cause the food to drip when thawed and the food will become useless.
  - d) Nutrients are drained away and also there is a major moisture loss.
  - e) It is therefore, important to see that the food to be deep frozen should be subjected to a quick freeze procedure.
  - f) Then these are to be stored at -20 degrees C.

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## 5.16 CHECK YOUR PROGRESS-II ANSWERS

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- Parts of canapé
  - Base - Cut out of breads, biscuits, toasts, éclairs, pastry case and Melba toast.
  - Spread - is applied on the base may be butter or cheese or combination of both. The spread can be flavored with various kinds of flavoring such as pimentos, garlic, mustard, parsley, olives, pepper (green or black), tuna, herrings, ham, tongue, goose liver, chicken liver, chicken salad etc.
  - Garnish - they should be colorful and dainty and should not be over garnished.

1. Piroshki is a type of canapé of Russian origin. They are little dumplings or filled pastries with different fillings like smoked salmon, eel, sturgeon, meatballs, beetroot etc. These are accompanied by different sorts of breads, mainly rye bread flavored with cumin, onion or poppy seeds. It is a type of Zakuski.
2. A dip or dipping sauce is a common condiment for many types of food. Dips are used to add flavor to a food, such as pita bread, dumplings, crackers, cut-up raw vegetables, seafood, cubed pieces of meat and cheese, potato chips, tortilla chips, falafel, samosa, pakoras etc. Indian dips may include sonth chutney, mint chutney, mango chutney, raita etc. Dips may be sweet or savoury or combination of both.

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## 5.18 TERMINAL QUESTIONS

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### Short answer type questions:

- Q1. Define Larder. What is its function
- Q3. Write a note on the different types of refrigeration system used in larder.
- Q3. What is the responsibility of Chef-garde- manger?
- Q4. List the names of atleast 20 equipments used in Larder
- Q5. What do you mean by Starters? How can they be classified?
- Q6. What do you mean by force meat? What is its composition?
- Q7. Write a note on different types of sausages.
- Q8.What is acid seasoning? Elaborate with examples.
- Q9. What do you mean by sandwich? What are its different parts?
- Q10. How are sandwiches stored?

### Write short notes on:

1. Cocktails

2. Smorgasbord
3. Cold English sauce
4. Zakuski
5. Caulis
6. Poor Boy
7. Horsd'oeuvres chaud
8. Basic vinaigrette
9. Boiled dressing
10. Verjuice

**What is difference between:**

- a) Salami and sausages
- b) BTL and Hoagie
- c) Open and closed sandwich
- d) Pate and terrines
- e) Xacutti masala and Harissa
- f) French vinaigrette and English veniagrette
- g) Zaatar and Sambal Oelek
- h) Galantines and ballotines
- i) Tomato ketchup and cauli
- j) Pate and terrine
- k) Garnish and dressing

**Long answer type questions**

1. Discuss in detail how larder coordinates with other departments of the kitchen is.
2. Write in details as how larder can be controlled.
3. What is the use of Stock sheet? Discuss.
4. Write in detail about three multifunctional machines used in larder.
5. What are Horsd'oeuvres? Discuss the different types of Horsd'oeuvres served from the kitchen.
6. Define canapé. What are the parts of canapé and write the process of its preparation.
7. What are the different types of force meat? Elaborate.
8. Discuss the different types of casings used in force meat preparation.
9. Discuss the different types of seasonings used in cold meat preparations.
10. Classify sandwiches with suitable example of each
11. Discuss the process of preparation of sandwiches.
12. Discuss at least 5 classical sandwiches of the world