CHAPTER 8

Milk

A. Introduction

B. Processing of Milk

C. Pasteurisation – Homogenisation

D. Types of Milk – Skimmed and Condensed

E. Nutritive Value

Exam - What is pasteurization of milk? 3

Exam – exam - What are the different types of milk? 5

Exam - Explain homogenization of milk. 3

Explain processing of milk.

Exam - What is the constituent of milk and its nutritive value? 5

Exam – difference between whole milk and toned milk. 5

MILK

Milk is one of the most basic of all food. Milk constitute a complete diet and even for adults, cow's milk includes many
essential nutrients particularly calcium. SOURCE:
Mankind from time immemorial has used the milk of animals. The milk of cow, buffalo and goat is generally used. In some countries milk of sheep, mare and camel is also used.

Milk represents a major ingredient in our diet- poured over cereals, drunk in glasses, in tea and coffee- but it also enters the composition of many dishes especially desserts such as ice cream, custard, pancakes, rice puddings etc. it is particularly high in calcium, but it is also fairly in fat.

COMPOSITION: Whole milk – that is, milk comes from the cow- is composed of water (88%), milk fat (3.25 %), other milk solids(protein, lactose and minerals)- 8.25%.

There are many types of milk consumed though mostly it is cow's milk, goat's milk and sheep's milk.

HISTORY OF MILK

Milk can be defined as a white opaque slightly sweet nutritious liquid secreted by the mammary glands, Milk has always been a symbol of fertility and wealth since biblical times and the promise land was described to be flowing with milk and honey. In India and Asia, zebus and water-buffalo's milk were considered sacred while the Romans and the Greeks were partial to the goat's and ewe's milk they also drank mares, camels, and asses milk.

Milk has a flourishing population of microbes. This is vital for natural coagulation of milk, but it can be harmful that is why various methods are used to pasteurize or sterilize the milk, thus avoiding detoriation and prolonging the length of time if can be stored.

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PROCESSING TECHNIQUES:

Processing

From the time it is milked from the animal to the time of sale, milk has to undergo processing to improve the keeping quality and to make it fit for consumption. The various stages are:

1. Collection

Milk is brought to the dairy in clean sterilized vessels, preferably stainless steel.

2. Holding tanks

The milk is immediately transferred to holding tanks and is held at 10°C to keep it safe. Cooling is done either in a tank,
jacketed with pipes in which runs a brine solution. Else the milk is run over very cold water pipes.

3. Filtration

The milk is passed through a series screens and filters to remove sediment and floating particles.

4. Pasteurization

It is the process of heating milk to 63.7°C and holding it at that temperature for 30 minutes. This is known as the "Holder Process of Pasteurization". Nowadays, the Flash Pasteurization is more commonly used. It is also called the HTST or High Temperature Short Time method, where the milk is heated to 71.6°C for only 15 seconds. Pasteurization makes milk safe for human consumption by destroying pathogenic germs (pathogens). It also helps to increase the shelf life. Flavour of the milk remains unaffected at pasteurization temperature.

5. Homogenization

At temperature of 60°C, milk is passed under high pressure through small opening of a machine called homogenizer. The main purpose is to subdivide the fat globules in milk and disperse them evenly in the entire mass. Fat has a low density and tends to rise to the surface during heating. Homogenization prevents this by first breaking up the fat into tiny particles and then dispersing them throughout the milk. This adds to the flavour and results in a better body.

6. Bottling

The bottles of selected and uniform size have to be sterilized by steam and hot water and then they are filled with milk, which are capped automatically. Nowadays milk is filled in plastic pouches and these are more economical, easily transported and save storage space. Plastic pouches are easily disposed and are safe to handle.

7. Sterilization

The sealed bottles are now heated for 30 to 40 minutes at temperatures ranging from 104-110°C in steam chambers called autoclaves and then allowed to cool. Milk can also be sterilized before bottling. It is subjected to temperatures of 135-150°C for just 1 second. This is called the UHT or Ultra Heat Treatment. This process kills off all microorganisms and the very short holding temperature reduces the changes in colour and lined with aluminum foil. Milk is then distributed through various outlets.

Various types of milk:

1. Untreated milk: it retains its entire natural flavor. It is advised to boil for 15 minutes before using. It remains good in refrigerator for 24 hrs.

2. Pasteurized milk: To kill bacteria by heating milk or other liquids to moderately high temperatures for a short period of time. Milk must be heated to at least 145°F for not less than 30 minutes or at least 161°F for 15 seconds, and then rapidly cooled to 40°F or lower.

3. Sterilized milk: is homogenized milk, heated to about 112ºC under pressure for 15 mins in sealed bottle. The bottle is rapidly pulled to 80ºC and then allows reaching lower temperature.

4. Skimmed milk: this is the milk without any fat. Basically it is a fat buster, low calorie produce

5. Fortified milk: extra nutrients are added to make the milk more nutritive. Usually vitamin B is used.

6. Flavored milk: flavor and color added. Treated with high temperature of 100ºC for about 15 mins, so that they may be kept later at room temperature.

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TONNED MILK : toning is done to make buffalo milk resemble in appearance and flavor to cow's milk. It is done by dilution and addition of skimmed milk powder. 40 % of skimmed milk is added to 60 % of buffalo milk. The addition of skimmed milk powder makes up for the dilution of the nutrients, the fat content remains diluted and equal to that of cow's milk.

Concentrated milk:

- Evaporated milk – unsweetened milk, evaporated under reduced pressure and reduced to 60% and canned.

- Sweetened milk- same as above but sugar is added before processing. Sugar acts as preservatives also.

- Milk powder-This is the whole milk from which the water is removed by either spray drying or by drying processes

C**ULTURED DAIRY PRODUCTS:**

Cultured dairy products such as yoghurt, butter milk, and sour cream are produced by adding specific bacterial cultures to fluid diary products. The bacteria convert the lactose to lactic acid, giving the products their body, and tangy and unique flavor.

USES OF MILK

- Used in soups & sauces.
- Used in vegetables preparation.
- Used for making puddings, cakes & sweet dishes.
- It is used for the preparation of non-alcoholic drinks such as milk shakes
- Used in preparation of hot drink such as tea, coffee, hot chocolates etc

Notes : WHOLE MILK: It comes as pasteurized & has fat content of 3.9 %.

CREAM

Cream is the butter fat content of whole cow's milk, separated from the water.

Cream is commercially separated from milk in a creamery, by means of a mechanical separator. The milk is first heated to between 32-49°C (90-120°F) before being run into the separator which operates like centrifugal machine, rotating at very high speed and forcing the milk, which is heavier, to the outside; while the cream, which is lighter, remains at the centre. The cream and the skimmed milk are drained out through separate outlets and by means of a control valve, the fat content is adjusted. The skimmed milk is then heated to 79.5°C (175°F) to kill off any harmful bacteria before being further processed into dried milk etc.

The principal difference between the various types of cream -single cream, double cream, whipping cream, clotted cream and soured cream - is the balance between water and butterfat. This will make them liquid or of a very thick consistency.

Other differences are in the way they have been made and their time for maturing which results in different tastes. Cream has a slight yellow or ivory color and is more viscous than milk.
Cream is used in kitchen to give flavor and body to sauce, soups and desserts.

Single Cream: contains not less than 18% butterfat. It cannot be whipped due to their being too little butterfat.

Double cream: contains not less than 45% butterfat. It can be whipped but not too much as it will turn to butter. It can be used to enrich sauces, but may curdle if boiled along with acid ingredients.

Whipping Cream: containing not less than 38% butterfat. It is perfect for whipping as its name indicates. After whipping you will find a difference in texture and a change in volume. Sweetened or unsweetened cream can be used in desserts or can be used as an accompaniment, and is incorporated in mousses to lighten them.
Clotted Cream: contains not less than 55% butterfat. It is already very thick so it can be used as it is and not whipped. Soured Cream: These are single creams which contain about 20% butterfat, but have a souring culture in them, and they are matured.

Half and Half: is a mixture of milk and cream in equal quantities and contains about 10-12% butterfat.

Note: Cream should be whipped at around 4°C. And for this it will be helpful to chill the bowls also so as to allow little dissipation of heat.

Manufactured Cream

1. Reconstituted Cream
2. It is made by emulsifying butter with skimmed milk or skimmed milk powder. This is not true cream, but a substance which resembles it in appearance.
3. Imitation or Synthetic Cream
4. It is made by the emulsification of vegetable fats with dried egg and gelatin, and then sugar and flavourings are added. It is a product which is frequently used in catering and baking trade, but which is very easily contaminated and liable to cause food-poisoning.

Uses of Cream

1. To serve with hot or cold coffee and chocolate.
2. To serve as an accompaniment (fruit based salad).
3. To be used fro decorative purposes in cakes and gateaux and for garnishes in soups and desserts.
4. As a main ingredient in certain desserts such as ice-cream and custards.

Storage of Cream

Fresh cream must be treated in the same way as fresh milk, as far as storage is concerned. Whipped cream must be covered and stored in sterilized containers in the refrigerator and used in the same day. Reconstituted and intimation cream must be refrigerated and only small quantities be whipped, when required for immediate use.

CHEESE

A. Introduction
B. Processing of Cheese
C. Types of Cheese
D. Classification of Cheese
E. Curing of Cheese
F. Uses of Cheese

Explain the types of cheese. OR
Exam - Classify cheese with suitable examples with their country of origin. 5
Exam - How cheese is processed? Or Steps in making cheese. 5
Exam -Exam - What are the Steps in making cheese? 5
Exam - List six uses of cheese in cookery.
Exam - Explain different types of cheese with their brand name and country of origin. 5

CHEESE

WHAT IS CHEESE ?

Cheese is the curd of or the fresh or matured product obtained by enzyme activity and subsequent separation of whey by draina ge, after coagulation of milk, cream, partly skimmed milk, butter milk or a combination of these bases.

The present word cheese is derived from the old English word "Cese" and "Chiese" from the Latin "Caseus". The equivalent words in
German" Kase", and French "Fromage", in Spain it is called "Queso", and in Italy "Fromaggio"

The ingredients used for the manufacture of cheese making are Milk, starter, colour, added chemicals, coagulates, salt.

COMPONENTS OF CHEESE MAKING

Milk - The various cheese of the world first owe their character and taste to the type of milk used - double cream, toned, or skimmed milk. The character also greatly depends on the animal the milk came from - cow, goat, ewe, or water buffalo.

Starter - If left in a warm place, milk will sour by itself. This souring is due to the action of bacteria on the milk sugar, lactose, and its conversion to lactic acid or sour milk. To speed up the process of souring and to prevent the milk from becoming bitter and unpleasantly sour, a little warm sour milk from the previous day's milk is added to this batch. This speeds up or starts the process of coagulation, and is known as the starter or starter culture. In the case of

pasteurized milk, all bacteria is killed, and hence the starter consists of a combination of cultures grown in the lab.

Rennet - Although the starter culture speeds up the process of souring milk, and would eventually cause it to curdle, it produces quite a sharp, acidic taste. The use of rennet, which is an enzyme from the inner lining of young hoofed animals like lambs and calves, significantly improves the product. Rennet also helps break down the curd into a smooth, even consistency, contributing to the texture and flavor.

TYPES OF CHEESE

The type of cheese produced by the cheese maker depends on the amount of moisture he wishes to eliminate and the size of the
cheese. The amount of moisture in the cheese will also determine what kind of rind or mould will grow on the cheese.

1. Fresh Cheeses

Fresh cheeses are usually made by setting the curd with starter and rennet and are high in moisture. The young curd is placed in sacks or perforated containers and drained slowly without pressure for a few hours so that the curd retains much of the whey. Once
sufficient whey has been drained off, the curds are either mixed or sprinkled with salt. They are now ready to be eaten. For some cheese, like from age fares, the rennet is not added. Such cheese are called 'lactic cheese'. Some fresh cheeses are allowed to mature and grow either a white or bluish grey mould.
Fresh cheeses are always mild and high in moisture and therefore low in fat. They have a slightly acidic or lactic taste. Most are used for cooking but some may be wrapped in leaves or dusted with paprika or fresh herbs for serving as a table cheese.

2 .Soft Cheeses

The curd is ladled gently into perforated moulds and left to drain in an atmosphere of high humidity so that the curd does not lose too much whey. After a few hours, the cheeses are turned out of their moulds and left to mature for a few weeks. Their high moisture content, coupled with high humidity, attracts and encourages the growth of classic white pencillium mould, which helps to break down the curd and contribute the flavour and texture of the cheese. The result is a creamy, smooth, interior that looks as though it is almost ready to run

3. Semi-hard Cheeses

To obtain a firmer cheese, the curd is cut up to release some of the whey before the curd is placed in the moulds. It is then often lightly pressed to speed up the draining. After a day or so, the cheese is turned out of its mould and washed in brine. This seals the rind before the cheese is placed in cellars or ripening rooms where moulds are encouraged to grow.

The lower moisture content means the fermentation process is slower, producing cheeses with a round, full bodied, rather than strong flavour. Their taste often seems to be embodied with the oils and esters of the wild mountain flowers of Europe. When young, semi- soft cheeses have a firm yet springy, school eraser texture, becoming elastic and supple.

4. Hard Cheeses

To make a hard cheese, the curd must be cut more finely - from small cubes to rice-sized pieces. - The smaller the pieces the more whey will be lost from the curd. The curds are then gently heated in a vat to force out more moisture before the whey is drained out. Salt is then added to the curd, which now resembles rubbery, lumpy cottage cheese. They may be cut again before being placed in large, perforated moulds that are frequently engraved with the unique symbol, logo, pattern or name to identify the finished cheese or its maker. This is then sealed and left to mature for weeks or even years. Hard block cheeses are pressed into shape and then matured in special

plastic wrap that allows the cheese to age without the development of either mould or rind. The moisture that would normally be lost during maturation is also retained.

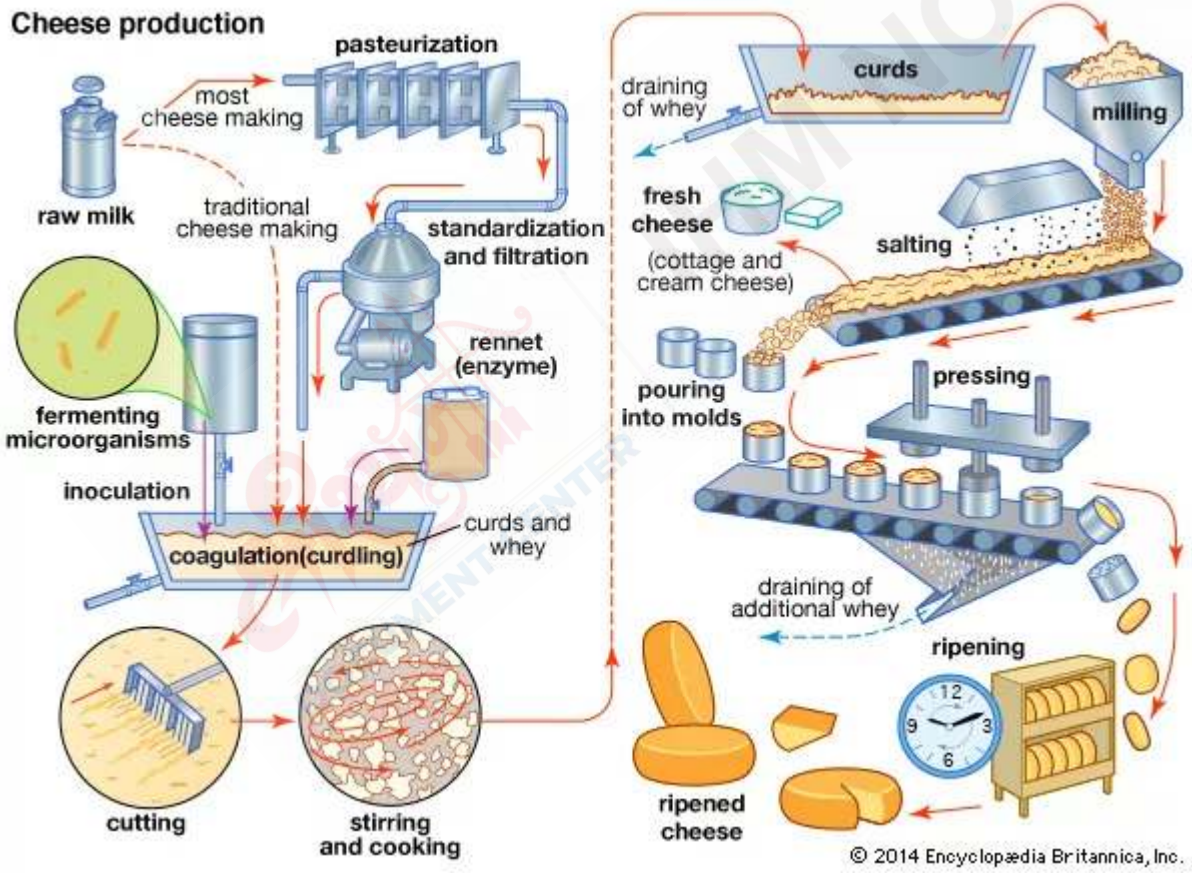
5. Blue Cheeses Blue cheeses are neither pressed nor cooked. Most frequently the curd is crumbled, eliminating much of the whey, then scooped into stainless steel cylindrical moulds, each with a wooden disc on top. The curd remains in the moulds for one to two weeks and is churned frequently to let the weight of the curds to press out more of the whey. Once the cheeses can stand up on their own, they are removed from the moulds, rubbed with salt, and returned to the cellars.

The blue mould is a strain of pencillium that is added to the milk before the rennet is added. For the blue mould to grow ho wever, it needs to breathe, and this is aided by piercing the cheese with rods. The blue then grows along the tunnels and into the nooks and crannies between the loose curd producing shattered porcelain look that typifies blue cheese. Most blue cheese are normally wrapped in foil to prevent them from drying up.

MATCHING WINE AND CHEESE

CHEESE	WINE
Fresh Cheese	Fresh light, crisp white wines like Sauvignon or Chenin Blanc Frascati, Soave or Loire whites
Soft cheese	Slightly sweet wine with the mild, slightly sharp or salty cheeses Fruity wines with rich, sweet and creamy
Semi-hard Cheese	Full bodied gusty whites or light, fruity reds Chianti Rioja Merlot

Hard Cheese	Mild - fruity reds like Merlot Medium - Cotes du Rhone, Cabernet Sauvignon Strong - Shiraz, Cabernet Sauvignon Extra strong - Port or Madeira
Blue Cheese	Mild - fruity whites or Rose wines like Vouvray, Chenin Blanc Piquant - Cotes du Rhone, Shiraz Roquefort - Sauternes Stilton - Port



The process of making cheese can be divided into three fundamental steps.The first is the precipitation of casein into curd. Bacteria that produce lactic acid are infused in to the warm milk to obtain an adequate acidity for the action of rennet and to crowd out less desirable organisms.Then , rennet is added , which causes the caseins to aggregate ,trapping fat globules and whey in the protein network.

The second stage is the concentration of curds .Any free whey is drained off. The curds are cut,pressed, cooked and salted to remove much of the rest.

The final stage is the ripening or ageing of the green curd. It transforms the initially produced bland and either crumbly or rubbery curds into a smooth substance with a pronounced and complex flavour.Ripening is mostly a matter of molecular breakdown caused by the enzymes of microbes , both the original starter bacteria and special ripening organisms.

One way of classifying the thounds of cheeses that are still made today is by the characteristic ripening organisms and their location.Blue cheese,for example .are ripened from within by veins of mould.Brie and Camembert from without by surface moulds. Another useful consideration is the water content ,which is primarily a function of the methods used in concentrating the curds.

Preparation of milk

Milk is one of the prime ingredient was making cheese, it is a high protein dairy product made from the milk of animals like cows, sheep, goat, buffalo, yak etc.

Prior to manufacture process, milk needs to be prepared; this is done by pasteurizing the milk, homogenizing it and then clarifying it.

Addition of starter

This is done by two methods:

In ***sour milk cheese*** lactic acid bacteria thickens the milk

In ***sweet milk cheeses*** (most cheeses are of this kind), which are also called *rennet cheeses,* the cheese maker adds rennet- an enzyme taken from the stomach of suckling calves to separate solids in the milk from the fluid.

The rennet causes the milk protein to build up and the milk to curdle without the milk turning sour. In this method all other solid particles like fat, protein and vitamins get encompassed. Most of the rennet used today in cheese making comes from the lining of a calf's stomach.

Formation of Coagulum

Addition of starter leads to coagulation of milk into a thick mass called 'young curd' and separation of whey.

When the process is complete the liquid whey is drained off and the solid mass of curd or coagulated milk protein is used to make cheese. At this stage this is called as 'firm curd'

Cutting

Firm curd is cut into smaller pieces by use of knives or chains. The size of the cut will be dictated by the type and recipe of cheese. In

most countries this process is carried out manually. This process is carried out for hard cheeses.

Stirring/ Scalding

This process is also carried out for hard cheeses. It expels more whey and shrinks the curd.

This process also speeds up the bacterial metabolism.

Salting

Salt is added into the cheese by wet or dry method as per the recipe. Brining in some cheeses also leads to longevity in shelf life

Moulding or Vatting and Pressing

After salting cheese is put in moulds for it to acquire a particular shape. This can be done in plastic or wooden moulds
The cheese is pressed which gives it a definite shape. In case of blue chesses pressing is not done.

Finishing
Cheese is de moulded and a rind or coating is given to the cheese.
This process includes coating, wrapping or bandaging the cheese. The softer cheeses acquire a natural rind while it matures.
In some cases rind is dried by rubber ash, use of grape must and wrapping it in leaves. Such as Gorgonzola which is coated with plaster of Paris

Ripening/ Maturing
Mostly the harder cheeses are matured. They are matured in caves. A hard cheese can take anything from 8 weeks to a year to ripen and mature.

Holding and storage
In Europe people normally place the cheese on a stone, cover it with a cover made of clay and store it in the coolest part of the house.

All first class hotels normally have a separate refrigerator to store cheese, as the temperatures normally maintained in the refrigerators are too high.

Cheeses are both held and stored under refrigeration. Their most significant limitation is that they tend to dry and harden when exposed to air. This means that as soon as you cut into a block of cheese you must either use it or you must wrap it up tightly in a plastic wrap.

Hard and firm cheeses if wrapped can keep from a week to several months if refrigerated. Even with the best of care, once a whole cheese has been cut it tends to dry out, get a sharper flavour, and develop inedible molds around the edges.

Semi soft and soft cheeses keep for about 1 to 2 weeks, the fresh cheese should not be kept for more than 1 week.

Cooking with cheese

Cheese cookery poses no problems so long as you keep the temperature low or the cooking time short or both. The high protein content of cheese means that it becomes tough and stringy with high temperatures and prolonged cooking. It's fat content may also separate out.

Cheese used in starch infused sauces must not be added until the thickening process is completed.

Cheese for gratinating should be added near the end of the cooking process. A glaze administered in the salamander is always a quick trip, whatever the product

Famous Cheeses of the world

English

Cheddar

Often called American cheese, but it is English and made in the Cheddar Gorge region in Somerset.

It is a best seller among the cheese and is a firm ripened type; it comes in many varieties ranging in flavour from very mild to very sharp “rat cheese”.

It is used in sandwiches and appetizers and as a dessert cheese. It is also the most used cooking cheese, the one the cook uses when the recipe says “cheese”.

Stilton

Considered the “King of Cheeses” and is the best of all English blue cheeses and can take its place confidently alongside the world famous Roquefort in France and Gorgonzola from Italy.

Stilton is a white cheese with a light yellow hue and a strong blue-green mold culture. The taste is spicy and is mostly drunk with a glass of Port.

Italian

Parmesan Another well-known flavourer of salad dressings and sauces.

It is a hard ripe cheese with a piquant and sharp flavour. This is the cheese you shake onto spaghetti, and it tastes delicious when you grate it fresh from a hard block.

Gorgonzola

Originally produced near Milan in a town called Gorgonzola, from full cream pasteurized cow milk.

It is very creamy, soft and marbled with blue veins. To allow the blue veining to spread through it the cheese is punctured with long high grade needles from one side and then a week later from the other side.

It has a sharp and spicy taste which is an excellent contrast to the creamy texture of the cheese.

Mascarpone

It is described as curd cheese.

Serves as a very good alternative to double cream cheese in tiramisu.

Bel Paese

Another delicious cheese from Italy, which is soft and yellow, sweetish and very mild. Made from pasteurized milk.

Dolcelatte

It is a famous sweet cheese from Italy

Mozzarella

Mozzarella is one of the most famous Italian cheeses, it is used more to give finish to a dish rather than taste.

It is a creamy cheese made from Buffalo milk.

Parmigiano - Reggiano

It is a hard cheese with orange rind.

It has a strong and fruity aroma, but not over powering. Used in sauces, salads and over pasta and risotto.

Ricotta

Is a soft, moist yet firm cheese.

Used as a dessert cheese with sugar and fruits and also in pastry fillings. It is also used for filling savories like ravioli

French

Brie and Camembert

Most French cheeses are soft and the luxury end of the scale is two dessert cheeses Brie and Camembert-both almost sauce soft. They taste much better than their aroma and rather unattractive appearance, which would lead you to believe. But an odour of ammonia will tell you when they are past their prime.

Roquefort

Comes from the region of Rouergue.

It looks like marble, for its noble paleness is patterned with blue veins and patches. It is made from sheep's milk that is full cream and unpasteurised. Is used for blue cheese dressing for salads.

It originates from a classic sheep area in the south of France called Roquefort sur Soulzon.

Reblochon

It has a creamy and supple texture. It has a yellow orange rind with a white mold. The elastic smooth creamy dough has a pleasantly mild taste somewhat reminiscent of hazelnut.

Boursin

Boursin is a soft fresh cheese it comes from Normandy region in France.

This is a moist and creamy cheese, it melts in the mouth.

Boursin is in two famous flavours i.e. cracked peppercorns and garlic.

Neufchatel

Comes from Normandy region in France.

It is a soft white cheese with a grainy texture.

It has a slight taste of mushroom and is salty and sharp.

Greece

Feta

This is a goat cheese from Greece made from goats or sheep's milk and is an integral part of Greek cuisine.

Swiss

Emmenthal

Emmenthal cheese is equated with Swiss cheese all over the world. It is made of raw cow milk and with the addition of rennet.

It is easily recognized by the large holes. The gas produced is partially entrapped in the cheese and this causes the formation of the holes. The smoother the productions the more even and attractive are the holes.

It is a mild cheese with a nutty aroma.

Gruyere

Another delicious cheese from Switzerland, which also has holes though, they are much smaller.

It's mild when young and sharper when older. It's a sharp cheese with a nutty aroma.

Raclette

Based on a variety of regional cheeses it was a meal for alpine herdsmen and farmers. At some point of time, we don't know when the
cheese got too close to the fire. Melted cheese was found to be delectable and thus the Raclette was born. Originally Raclette was limited to just jacket potatoes and pickles. These days we have a whole new range with chicken, meat, fish, game and vegetables count among the ingredients.

A Raclette grill has a heating element under which you place your cheese and then serve it. Authentically the cut surface of half the cheese is pushed towards the fire, and the melting cheese is scraped onto the plate. The cheese is scraped with a knife.

It was the knife, which gave its name. Derived from French *Raclette* means spatula or scraper.

Holland

Edam

Named after the small port of Edam, north of Amsterdam, it is a pressed, semi soft cheese. Edam is coated in red wax, which makes it so distinctive and is sold young. Edam coated in black wax indicates that it is aged between 4-10 months.

Gouda

It accounts for more than 60% cheese in Holland. Gauda is firm, smooth and supple cheese; it has a sweet and fruity flavour. Also had as a breakfast cheese.

Danish

Danablu/ Danish Blue Danablu is a one of the most famous blue cheese. It is sharp, metallic and salty taste Indian cheeses used in Hotels

Amul

Britannia

Flanders – Mozzarella, Gouda, Quark (Cream Cheese)

Cheese fondue

Switzerland attributes its standard of living to cheese and has a great many cheese recipes of which the cheese fondue is the most famous. Facts worth knowing about fondue

A fondue pot with a handle is a must whether it is made of glazed ceramic, clay or enameled cast iron.

The basic recipe contains white wine and two kinds of cheese grated or shredded, all combined and stirred while heating.

Usually Emmenthal and Gruyere are used in combination as one alone would be too mild and the other alone would be too sharp. A little lemon juice should be added to the wine to provide greater acidity to break up the cheese.
The thickened and sharp cheese dish is taken and served to the guest over a lamp at the table. Guests help themselves to bite sized pieces of bread, spear a piece of bread and dunk it into the cheese cream.

CHEESES OF THE WORLD

CHEESE	TYPE	COUNTRY	MILK
Cottage	Fresh	Universal	Cow, goat, buffalo
Cream	Fresh	Universal	Full cream milk of cow, goat, buffalo
Mozzarella	Fresh	Italy	Cow, buffalo
Ricotta	Fresh	Italy	Cow
Feta	Fresh	Greece	Ewe, cow, goat
Quark	Fresh	Germany, Austria	Cow
Barbery	Soft	France	Cow
Bel Paese	Soft cream	Italy	Cow
Brie	Soft	France	Cow
Camembert	Soft	France	Cow
Bonchester	Soft	Scotland	Jersey Cow
Munster	Soft, with orange red rind	France	Cow
Stracchino	Soft	Italy	Cow, buffalo
Appenzeller	Semi hard with pale yellow or burnt orange rind	Switzerland	Cow
Caerphilly	Semi-hard with buttermilk flavor	Britain	Cow
Cantal	Semi-hard	France	Cow
Cheddar	Semi-hard	Britain	Cow
Cheshire	Semi-hard	Britain	Cow
Chevre	Semi-hard	France	Goat
Danbo	Semi-hard, caraway flavored, square cheese	Denmark	Cow
CHEESE	TYPE	COUNTRY	MILK
Derby	Semi-hard	Britain	Cow
Edam	Semi-hard with yellow or red wax rind	Netherlands	Cow
Emmenthal	Semi-hard	Switzerland	Cow
Esrom	Semi-hard, with red rind	Denmark	Cow
Gloucester, Double Gloucester	Semi-hard, full cream	Britain	Gloucestershire cow
Gouda	Semi-hard, with yellow or red rind	Netherlands	Cow
Gruyere	Semi-hard, with pea size holes	Switzerland	Cow
Havarti	Semi-hard	Denmark	Cow
Jarlsberg	Semi-hard, with yellow coating	Norway	Cow
Lancashire	Semi-hard	Britain	Cow
Leicester	Semi-hard	Britain	Cow

Limburger	Semi-hard, pungent	Belgium, Germany	Cow
Pont l'Eveque	Semi-hard, square cheese	France	Cow
Port Salut	Semi-hard	France	Cow
Reblochon	Semi-hard, creamy with a mild flavor	France	Cow
Tilsit	Semi-hard, strongly flavored	Germany	Cow
Raclette	Semi-hard	Switzerland	Cow
CHEESE	TYPE	COUNTRY	MILK
Asiago d'Allevio	Hard	Italy	Cow
Bergkase	Hard	Germany	Cow
Caciocavallo	Hard, saddle-shaped	Italy	Cow
Kefalotyri	Hard	Greece	Cow
Sauermilchkase	Hard	Germany	Cow
Parmigiano Reggiano or Parmesan	Hard	Italy	Cow
Pecorino Romano	Hard	Italy	Cow, buffalo
Provolone	Hard, smoked	USA, Australia, Italy	Cow, buffalo
Sapago	Hard, green, with dried clover aroma	Switzerland	Cow
Bavarian Blue	Blue, cream	Germany	Cow
Blue d'Auvergne	Blue	France	Cow
Blue de Bresse	Blue	France	Cow
Blue de Laqueuille	Blue	France	Cow
Blue Shropshire	Blue	Scotland	Cow
Blue Cheshire	Blue	Britain	Cow
Danablu	Blue	Denmark	Cow
Dorset	Blue, hard pressed, crumbly	Italy	Cow, skimmed milk
Gorgonzola	Blue, soft, with sharp taste	Italy	Cow
Roquefort	Blue	France	Ewe
Stilton	Blue	Britain	Cow

BUTTER

A. Introduction

B. Processing of Butter

C. Types of Butter

Processing of butter. Types of butter.

Differenciate between compound butter and salted butter.

Butter is fatty substance obtained from churned cream, containing 80% fat, 20% water and whey (milk solids lift from separating process).

- Butter hardens at low temperature and melts when heated.
- The smoking temperature of butter is 127°C.
- Color varies form creamy white to golden yellow. It is the milk protein in the whey that makes butter spoil quickly.
- Most of the butter is made form cow's milk but other are some butter made from the milk of buffalo, yak, goat
- and sheep is also available.

PROCESSING / MANUFACTURING OF BUTTER

1. **HOLDING:** Cream is pasteurized for 2-4 seconds at 95° C and then the temperature is lowered to 4-5° C and that is kept for several hours to ensure uniform hardening of fat particles.

2. **RIPENING:** When the end product is going to be Lactic butter, only then this step is carried out, in which bacterial culture is added. In this case, the holding temperature will be 15-18° C for 3-4 hours before being cooled to 4-5° C. This gives butter a good flavour and the stage is omitted while making sweet cream butter.

3. **CHURNING:** It is carried out in big stainless steel containers holding about 100 gallons of cream and the internal churners pass through the cream. This breaks the layer of fat solids which are released and are combined to form a large group of butter fat. After about 30 minutes of churning the butter gets separated from butter milk and floats to the surface.

4. **WASHING AND SALTING:** The butter grains are now washed with ice cold water to remove any butter milk left on the surface of each grain, in order to maximize the keeping quality.

Salting is carried in two ways:

- By adding fine grains of dairy salt.
- By dipping butter grains into brine solution (salt + vinegar) for 10-15 minutes and allowing the butter grains to absorb it.

Types of butter :

There are two types of butter-

1. Sweet cream butter
2. Lactic butter.

Butter can be made from any kind of milk. In india, butter is made from buffalo milk. Sweet cream butter : it is also known as fresh cream butter and is made from unripened cream. It can be salted or unsalted. It is soft, creamy texture and a creamy buttery taste.

Lactic butter : this type of butter specially made in Denmark, Holland and france. The cream is mostly pasteurized, inoculated with a culture that ripens the butter, then pasteurized once more to arrest the ripening process.

Uses of Butter

- As a spread for bread, toast and scones
- As a basic ingredient in pastry-making and cake-making.
- Used as an accompaniment (compound butter).
- To enhance the taste and flavour of soups and sauces.
- As a cooking medium (The smoke point of butter fat is only 127-130°C; so a vegetable oil should be used when high cooking temperatures are required).
- For butter sculptures.

Butter is available in 10 Gms, 100 Gms and 500 Gms packs in the market.

Notes :
Unsalted butter /sweet butter- it has mild aroma and slightly sweet flavor, used for making swet pastries and cakes.

Salted butter –butter was originally salted to preserve it for the winter months when fresh butter was not made. Today salted is added to butter as ingredients. It is not ideally used in preparation of pastries.

Compound butter : these are made by adding a particular natural flavor or color to butter, depending on the type of food with which it is served. It is generally used as an accompaniment e.g. Lobster butter, parsley butter etc.

Ghee : it is obtained by clarifying butter. Butter is heated to evaporate water. Pure ghee has a higher keeping quality and is a goo cooking medium and shortening agent used in Indian cuisine.