

MILK (LAIT) & MILK PRODUCTS

A white opaque slightly sweet nutritious liquid secreted by the mammary glands. Milking animals was originally a religious ritual among the early human societies that raised livestock. Milk has always been a symbol of fertility and wealth: in the Bible the Promised Land is described as “flowing with the milk and honey”, and Moses proclaimed that the milk of cows and ewes were gifts from God. In Asia and India, zebus’ and water-buffaloes’ milk are sacred. Like the Greeks, the Romans were partial to goats’ and ewes’ milk, but they also drink meres’, camels’, and asses’ milk.

In general, this refers to cow's milk, though some countries goat's and ewe's milk are equally important for using fresh and making of cheese and other milk products. Other types of milk used in various parts of the world include Mare's, Buffaloes' and Camels'. Soy milk, produced from soy-bean, is becoming increasingly available and is a useful substitute for cow's milk for anyone allergic to cows' milk particularly babies or following a vegan diet.

The composition of milk varies according to the type and breed of animal, its state of health, and the diet on which it has been reared.

In most western countries the word ‘milk’ without specification means cows’ milk, the most readily available kind. Cows’ milk is a very nourishing food, yielding 65Cal per 100g, and 1 litre contains, on average 870g water, 39g emulsified fats (which give milk its white colour), 33g proteins (including casein, which is coagulated by rennet as curds), 45g lactose (milk sugar, which some people find difficult to digest and is the cause of some allergies), 7 - 10g minerals (mainly calcium), and a variety of vitamins.

Milk is a highly nutritious food and a major source of protein and calcium. A full refreshing drink in summer, or a warming one in winter, milk is one of the most versatile ingredients in the kitchen. It is a vital for making of wide range of dishes – sauces, soups, batters, pancakes and many delicious desserts. Milk contains bacteria which, if allowed to develop, produce lactic acid acts on the protein in milk (CASEIN), resulting in the separation of the milk into curds and whey. It is this property of milk that is put to good use in the production of all types of cheese and yogurt.

The composition of milk has a significant influence on the type of cheese that is made from it: very fresh milk with a low level of acidity is used for Gruyere cheese; Pont l’Eveque is made with milk that is virtually straight from the cow; while the milk can be slightly acid for Camembert cheese. The flavour of butter is also affected by the diet on which the animal has been reared.

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

Pasteurisation is a method of sterilising the milk and destroying pathogenic (disease carrying) organism, while, at the same time, reducing the number of souring organism present. Homogenisation breaks down the globules of fat so the cream does not separate out easily. Raw, untreated, unpasteurised milk is sometime available and many people consider its creamy richness far superior to pasteurised milk. However, it can carry a health risk, despite thorough testing and a certifying of cows’ as Brucellosis and Tuberculosis free, and is not recommended for young children, elderly people or pregnant woman.

USES OF MILK

Milk is a very versatile food: it is the basic ingredient of fresh cream, butter, cheese and yogurt, and it makes a delicious drink, either on its own or flavoured with fruit, vanilla, chocolate, etc. It is stirred into tea and coffee and forms the basis for many hot drinks, notably chocolate. Milk shakes are popular, and this versatile liquid can even be used in cocktails. Milk can also be thickened and flavoured to produce various desserts. Fermentation preserves milk and alters its flavour. Apart from spontaneous coagulation, due to the action of the lactic microbes in the milk producing curds and curdling by means of rennet, there are many other types of fermented milk. Leben, Kummis and Kefir from the Middle East, Indian Khir and Gioddu Sarde, Icelandic Skyr, etc., are examples. Curdled milk was formerly used as a basis for many French rural dishes: Lait Ribot is churned milk poured over mashed potato; Lait Cuit (cooked milk) is left to curdle naturally then heated gently, and eaten with buckwheat pancakes; Lait Marri is boiled, mixed with Lait Ribot, and sweetened with sugar; etc.

Milk is an indispensable ingredient in modern cookery and is essential for many sauces, such as bechamel, Nantua and soubise. It may also be added to soups, used in gratin dishes, court-bouillons for certain fish, and even in meat cookery (roast pork with milk). Desserts such as custard and cooked creams require large quantities of milk, as do ice creams and batters for pancakes, waffles and fritters. Another, more unusual, use is in milk jam, where the milk is reduced to a heavily sweetened caramel and then flavoured with vanilla.

TYPES OF MILK

Five different types of pasteurised milk are available, each classified according to fat content.

1. **CHANNEL ISLAND (GOLD TOP)** - This is the richest, creamiest milk with 4.8% of fat content.
2. **WHOLE MILK (SILVER TOP)** - Most of the cream rises to the surface to give a visible cream line. It contains 3.8% fat.
3. **HOMOGENISED (RED TOP)** - Whole milk (3.8% fat) in which the cream has been evenly distributed throughout.
4. **SEMI-SKIMMED (SILVER & RED STRIPE TOP)** - A little over half the cream has been removed to give between 1.5% and 1.8% of fat.
5. **SKIMMED (SILVER & BLUE CHECKED TOP)** - Almost all the cream has been removed to give 0.1% fat. This milk is ideal for anyone trying to reduce fat consumption, but should not be given to babies or young children who need the additional & fat soluble energy and vitamins A & D provided the fat content in whole milk.

Other types of whole, semi-skimmed and skimmed milk widely available are:

1. **STERILISED** - This is homogenised milk that has been heated to boiling point or above to ensure a sterile product.
2. **ULTRA HEAT TREATED (UHT)** - Known as UHT or long life milk, this has been homogenised, then ultra heated (to 132°C and 270°F) and aseptically packaged in foil line containers.
3. **CONDENSED** - This is pasteurised, homogenised milk that is boiled under special condition until it reduced to about 1/3rd of its original volume.
4. **EVAPORATED** - It is not pasteurised or sweetened but it is sterilised by heat after canning. It is evaporated to half its original volume then homogenised, canned and sterilised.
5. **DRIED MILK POWDER** - This may be either whole or skimmed milk that is spray dried or condensed and roller dried.

STORAGE

Milk is a perishable product and therefore must be stored with care. It will keep for 4—5 days in refrigerated conditions. Milk can be easily contaminated and therefore stringent precautions are taken to ensure a safe and good quality product for the consumer.

- Fresh milk should be kept in the container in which it is delivered.
- Milk must be stored in the refrigerator (4-5 days).
- Milk should be kept covered as it easily absorbs smells from other foods, such as onion and fish.
- Fresh milk should be ordered daily.
- Tinned milk should be stored in cool, dry ventilated rooms.
- Dried milk is packaged in airtight tins and should be kept in a dry store.
- Sterilised milk will keep for 2-3 months if *unopened*, but once opened must be treated in the same way as pasteurised milk.
- UHT (ultra-heat-treated) milk will keep unrefrigerated for several months. Before using, always check the date stamp which expires 6 months after processing and make sure to rotate stocks. Once opened it must be refrigerated and will keep for 4-5 days.

BST IN MILK

Bovine Somatotropin is a natural growth hormone that is produced in the pituitary gland of the cow and regulates milk production. It is secreted by all cows and is present in minute quantities in all milk. Experiments have shown that by increasing the amount of this hormone in a cow, its milk production can be artificially increased. At

first BST was extracted from its natural source, the pituitary gland, but BST has now been genetically engineered in the laboratory and is available in large quantities for injection into cows.

MILK PRODUCTS

BUTTER MILK - The liquid leftover after cream has been turned into butter by churning. It is composed of water, mineral salts, protein and milk sugar and has a sour flavour. Since it does not contain the fat of the cream, it is currently considered a healthy sour milk substitute.

BUTTER - A solid substance made by churning cream in special conditions of temperature. The cream must first be separated from the milk, then it is pasteurised, that is heated to a high enough temperature to destroy enzymes and bacteria, then rapidly cooled before churning begins. "Churning" involves rapidly agitating the cream until the fat it contains forms a solid mass that can be gathered, washed and shaped to make butter. The composition of butter must be at least 78% milk fat, 20% other milk solids and not more than 16% water.

CREAM - If whole cow milk is left to stand, the richest part of it, consisting of larger but lighter fat globules, rises to the top to form the cream. All creams are perishable and must have a fat content of at least 35%.

CURD - The parts of milk which coagulate when natural fermentation takes place, or when a curdling agent such as rennet or an acid is added. It consists of the milk protein plus fat and other constituents trapped with them.

ICE CREAM - A very popular frozen confection made from a mixture based on milk or cream but to which may be added a variety of flavourings and colourings. U. K. Legislation states that all ice-cream must contain at least 5% milk fat and 7.5% milk solids.

MILK PUDDING - Milk forms the basis of many puddings and desserts. However a milk pudding is generally an old fashioned hot dish made by cooking some kind of grain in milk. The grain used may be rice, sago, tapioca, semolina or oatmeal and puddings may be enriched by the addition of eggs and cream, flavoured with dried fruits or spices or given a caramel topping.

MILK SHAKES - Served chilled, this is a refreshing drink made by whisking milk with a flavouring, such as strong coffee, chocolate powder, fruit juice or fruit syrup.

YOGURT - It is a fermented milk product. It is made by introducing 2 harmless bacteria, *Lactobacillus Bulgaricus* and *Streptococcus Thermophilus* into either whole or skimmed milk.