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by

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VARIETIES OF CHEESE

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While Cheddar cheese is by far the main type as far as English speaking countries are concerned, it is only one of a large number of varieties of cheese which are becoming more universal in production and consumption. In other than English speaking countries Cheddar cheese is almost unknown and yet the consumption of cheese in some of these countries is very much greater.

The naming of cheese types has usually been a result of the use of the name of the place where the cheese was first made. Thus cheeses of similar type but produced in a different locality or country, were given different names.

While small differences may occur between cheese produced in different localities these differences are not sufficient to warrant the naming of the cheese as distinct types. For example, Cheddar cheeses produced in different localities sometimes have slight differences which an experienced cheese grader can readily detect but all cheese would still be regarded as Cheddar type.

With a very large number of named cheeses to consider it is necessary to find some basis for dividing the cheese into groups and thus a study of the group will cover the main features of the many named cheeses which might be included in that group.

One basis for classifying cheese which has been commonly used is that of "body" or firmness. Cheese may be divided into "Hard", "Semi-Hard" or "Soft". However, there is considerable overlapping with some types of cheese when this method of grouping is attempted in spite of major differences in the nature of the cheese apart from "body".

What is perhaps a more informative system of classification involves firstly dividing cheese into "ripened" and "unripened" types and then grouping the ripened types on the basis of the main ripening agent (apart from rennet) or the type of organism responsible for most of the characteristic flavour development. Thus the division of the ripened varieties of cheese may be into three groups representing those ripened mainly by:

1. Bacteria
2. Moulds
3. Surface flora

Even with this system of grouping cheese there is some overlapping. For example, there is some bacterial ripening in all types of cheese and there is a certain amount of surface flora formation on mould ripened cheese. However, the predominance of bacteria, mould, or surface flora is usually easily recognisable and this grouping is based on the ripening agent which predominates.

RIPENED CHEESE

Cheese ripened by bacteria

This group includes those cheeses in which most of the ripening and flavour development is a result of the action of bacteria within the cheese. In considering these cheeses it is found that they can be formed into two sub-groups on the basis of the presence or absence of round holes known as "eyes" in the cheese.

Cheese with eyes

Within this sub-group can be included such cheese as Swiss Gruyere and Emmenthal, Swedish Jarlsberg, Danish Samsoe, Fynbo, Elbo, Danbo and Molbo, and Dutch Gouda and Edam.

The size of the eyes formed is fairly precise for each variety of cheese. Thus the large "eyes" in Gruyere cheese are a defect in Gouda or Samsoe cheese and the small eyes in Edam and Fynbo are a defect in Emmenthal.

Gruyere and Emmenthal cheese are very hard cheese of about 35 per cent. moisture produced by cooking curd from sweet milk to a high temperature of about 50°C. Propionic acid organisms either present in the milk or added as a culture are thought to be largely responsible for the gas production which causes the typical large eyes to form, often 2 cm or more in diameter in Emmenthal, and for the typical sweet flavour of the ripened cheese.

The Gouda and Edam cheese of Holland differ in their composition and in their shape. Gouda is shaped like a flattened sphere whereas Edam is a round ball-
shape. Gouda is higher in fat content and lower in moisture and salt contents than Edam. Both cheeses are mild and aromatic but the Edam is slightly more salty in flavour and both contain eyes of about 0.5 cm in diameter.

A characteristic of these Dutch and Danish types of cheese is that they are all produced with a very close texture, except for the "eyes". This is achieved by the technique of pressing the curd in the whey with the exclusion of air. The curd is gathered together behind retainers and pressure is applied by means of metal plates placed on the curd mass as the whey is drained off. The one large block of curd so formed after 15-20 minutes is cut into individual blocks for each hoop. The small block of curd is then placed in the hoop without any breaking up of it.

**Cheese without eyes**

The familiar Cheddar cheese comes into this category, as does the other famous English cheese known as Cheshire.

Cheshire cheese is popular in England especially in the northern provinces, and it is strange that it is scarcely produced at all in other English speaking countries. This cheese has a loose almost crumbly body and a more acid flavour than Cheddar, is higher in moisture content and generally possesses a more pronounced flavour than Cheddar of the same age.

The general principles of manufacture of Cheshire are similar to those which apply to the production of high acid Cheddar. However, in place of the cheddaring, the curd is kept broken into lumps about as big as a clenched fist and the type of mill used tears the curd into small ragged pieces instead of giving the smooth slicing effect of a Cheddar mill.

Another large collection of cheese which comes into this category is made up of Italian hard cheese such as Parmesan, Romano and Provolone.

The Samsoe, Fynbo, Danbo, Elbo and Molbo cheeses of Denmark are similar in general characteristics and differ mainly in size and shape although these differences cause other slight variations such as in moisture content. Containing eyes of from 0.5 to 1 cm in diameter according to the particular variety, the cheeses have a fairly firm though not waxy body and a mild aromatic flavour. Fynbo is similar to Dutch Gouda and Molbo resembles Edam.

Makers of Dutch cheese have to be expert at fitting square blocks of curd into round hoops. Gouda cheese is being whee in the foreground and the round "cannonball" Edam in the background.
Edam cheeses on saucer shaped depressions in curing room shelves. Careful turning of the cheeses preserves the round ball shape as they mature.

Ragged blocks of Cheshire cheese curd in the vat before milling and salting. The broken, crumbly nature of the curd carries through into the cheese contrasting with the much smoother body of Cheddar cheese.

The driest and hardest of these cheeses such as Parmesan and Romano are grating cheese and formerly were ripened for up to two years in order to develop the characteristic sharp flavour. However, it has been found that the addition of lipolytic enzymes to the milk allows full flavour to be developed in a much shorter time.

The other cheeses such as Provolone are not nearly so dry and hard and are eaten as table cheese while quite young.

Mozzarella is a pliable cheese used a great deal in pizza making.

Fetta cheese, of Greece, is of interest in that it is cured and held in salt brine until it is consumed.

Cheese ripened by moulds

The group of cheese ripened by moulds may be subdivided on the basis of whether the mould is of the blue-green Penicillium roqueforti or the white Penicillium candidum.

Cheese ripened by blue mould

The blue-veined cheeses which are characterised by the bluish-green tracery of mould throughout the cheese include Roquefort of France (said to be the original blue vein cheese), Danish Blue (which is a copy of Roquefort but made from cows' milk, whereas true Roquefort is made from sheeps' milk) Gorgonzola of Italy, Stilton of England and Mycelia of Denmark, which are both similar to Gorgonzola.

The characteristic sharp flavour of blue veined cheese is due to the lipolytic action of the enzymes produced by the mould. This is the distinction between these cheeses and those ripened by bacteria, where the main flavour-producing action of the bacterial enzymes is proteolytic in nature.
Stilton cheese from several weeks (right hand shelves) to several months of age (left hand shelves). Note the heavy crust of blue mould developed on the older cheese. This is encouraged to grow within the cheese by piercing it with needles.

There is protein ripening in blue veined cheese, but it is considered of secondary importance, especially in the case of Roquefort and Danish Blue. This is actually the difference between these blue veined cheeses and the Gorgonzola types, which have a more pronounced protein ripening and therefore a fuller flavour.

This difference is achieved (as are practically all differences between cheese varieties) by variations in the method of manufacture and of curing which have their effect on the ripening process which determines the nature of the mature cheese.

Cheese ripened by white mould

The white mould cheeses are mainly produced in France, where a great variety of names exist for cheeses made in different provinces. Such cheeses as Brie, Camembert, Carre de L'est, and Coulommiers would be the best known members of this group.

The white mould, *Penicillium candidum* (or *camembertii*) is grown on the outside of the cheese instead of being encouraged to grow through the cheese by producing an open texture and piercing with needles as is done with blue veined cheese.

The ripening action of this mould is mainly proteolytic, in contrast with the lipolytic action of the blue mould, and proceeds from the surface of the cheese towards the centre. Thus these cheeses are made small in size and of shallow depth in order to allow the ripening to take place right through to the inside of the cheese in a fairly short time and before the outside of the cheese becomes over-ripe.

Brie cheese showing a fuzzy coating of white mould after several weeks in a humid curing room. The cheeses are being wrapped for sale.
Camembert cheese ready for eating. The white “fuzz” of mould covering the cheese when cured becomes part of the thin crust on the cheese covering the soft ripened interior.

The white mould cheeses are very soft and develop a fairly strong flavour while quite young. Thus they are normally eaten when only four to six weeks of age.

Cheese ripened by surface flora
A group of cheeses can be formed which, in the course of ripening, develop a coating of flora on the surface.

This surface flora is encouraged to develop by rubbing the surface of the cheese with water or brine daily from when it is first removed from the hoops. It is composed mainly of the organism *Bacterium linens*, but a sequence of development takes place.

Initially, large numbers of yeasts grow on the surface of the cheese but they are gradually overcome by growths of mould and later *Bacterium linens*. Mould growth is largely prevented by the daily rubbing of the wet surface of the cheese which breaks up the mycelia or branches of the mould and so prevents it from spreading. As the cheese ages the surface flora causes the rind of the cheese to turn an orange-brown colour.

Proteolytic enzymes produced by the surface flora penetrate into the cheese and produce a strong smelling and pungent flavour and aroma in the ripening cheese. These cheeses are made quite soft and prolonged ripening converts them to a very pasty consistency.

The age at which the cheese is eaten governs the extent of flavour development and allows a further sub-division of this group into cheese eaten after short ripening (about four weeks of age), cheese ripened for a medium period (six to eight weeks) and cheese ripened for a long period (eight to 12 weeks).

Surface flora-ripened cheese eaten after short ripening
This sub-group includes the Port du Salut and its imitation, Saint Paulin, cheese. These cheeses are consumed usually when only about 4 weeks of age, and are still relatively mild in flavour, although slight surface ripening does occur.

Surface flora-ripened cheese eaten when six to eight weeks of age
The Havarti cheese of Denmark, the Tilsit and the Munster cheese of Germany can be included in this subgroup. Quite an amount of ripening takes place on the surface of these cheeses and protein is broken down to the extent that some ammonia is produced and is evident in the atmosphere of the curing room. These cheeses are thus fairly strong and pungent in flavour.

Surface flora-ripened cheese eaten when eight to 12 weeks of age
Limburger cheese is probably the strongest smelling if not the most highly flavoured of all cheese and it belongs in this sub-group. Considerable ammonia is produced during the prolonged ripening of the cheese which, by the time it is consumed, is reduced to a very soft paste.

UNRIPENED CHEESE
The group of unripened cheese includes such types as Cottage, Cream, Ricotta and Petit Suisse, which are prepared from freshly soured milk (with or without the addition of some rennet) and which are ready for immediate consumption without any ripening period. Their storage life is short and within a few weeks they may lose their typical characteristics.

Cottage cheese is prepared from skim-milk but it is also presented as “creamed Cottage cheese” which is prepared by mixing a quantity of cream with the fresh Cottage cheese.

Cream cheese is manufactured from milk to which extra cream has been added. It varies in consistency from that of whipped cream to the stiffer body of Philadelphia Cream cheese. The French Petit Suisse is a soft type of Cream cheese. Fresh Neufchatel is another example.

Ricotta cheese is of particular interest in that although it resembles cottage cheese it is prepared from whey rather than skim-milk, although some skim-milk is commonly added to the whey. Those milk proteins which remain in solution in the whey when other varieties of cheese are manufactured are curdled by heat and acidity to form a soft curd. This is drained and chilled for sale as Ricotta cheese.

PROCESSED CHEESE
The cheeses described above are referred to as “natural” cheese as they are eaten in their original or natural state. However, almost any of them, the main exception being the unripened cheeses, may also be prepared as a “processed” cheese or cheese “spread”.

Processed cheese is prepared by mincing a selected blend of natural cheese (both young and old) and mixing with chemical emulsifier and added water while heating to
a molten state in a vessel. The molten mixture is then mechanically packaged in hermetically sealed portions and allowed to solidify with cooling.

A very wide variety of spices, essences and other flavoursome foodstuffs, such as smoke essence, mushrooms and prawns may be added to the cheese mixture to produce a great range of flavours. However, a large proportion of processed cheese is produced without the addition of such flavourings, being dependent on the flavour of the blended cheese alone.

The heating involved in making processed cheese destroys the bacteria and enzymes which are responsible for ripening or maturing. As a consequence, processed cheese does not increase in flavour with aging as does natural cheese.

Cheese spreads are essentially processed cheese with sufficient extra water added to produce a soft spreadable consistency in the finished product.

THE SEED CHEESE

Although various herbs, spices and seeds may be added to processed cheese as described above, they may also be added to natural cheese, e.g. Cottage cheese with chives, Samsoe cheese with caraway seed, Edam cheese with cumin seed, Pecorino cheese with peppers (Pecorino Pepato). In the case of these natural cheeses the seed or spice is mixed with the cheese curd before packaging or forming it into blocks.

There are in addition, a small number of "seed" cheeses which are distinct ripened varieties in their own right and are not just a particular natural cheese containing seed. Examples are Dutch Leiden cheese which contains cumin seed and Dutch Friesian cheese which contains cloves. These are firm, pressed cheeses with a mild though slightly acid flavour augmented by the presence of the cumin seed or cloves. The cheese contains numerous small irregular openings resulting from the disturbance the curd receives when the seed is being mixed through it before forming and pressing.

Friesian cheese dotted with cloves which are added during the making of this Dutch "seed" cheese.
CLASSIFICATION OF CHEESE VARIETIES

RIPENED CHEESE

- Ripened by bacteria
  - With eyes
    - Eyes < 1 cm: e.g. Gouda, Edam, Fynbo, Molbo, Elbo
    - Eyes > 1 cm: e.g. Gruyere, Emmenthal, Jarlsberg
  - Without eyes
    - e.g. Cheddar, Colby, Romano, Parmesan, Provolone, Mozzarella, Fetta

- Ripened by mould
  - Short ripening: e.g. Port du Salut, Saint Paulin
  - Medium ripening: e.g. Havarti, Munster, Tilsit, Ambrosia
  - Full ripening: e.g. Limburger

- Ripened by surface flora
  - Blue mould
    - Some protein breakdown: e.g. Roquefort, Danish Blue, New Zealand Blue
  - White mould
    - Considerable protein breakdown: e.g. Gorgonzola, Stilton, Mycella

UNRIPENED CHEESE

- e.g. Cottage Cream Petit Suisse Ricotta

- e.g. Cottage Cream Petit Suisse Ricotta

- e.g. Cottage Cream Petit Suisse Ricotta

- e.g. Cottage Cream Petit Suisse Ricotta