



FATS AND OILS

Fats and oils have the same chemical structure. Fats which are liquid at room temperature are called oils. Fats and oils are insoluble in water. Fats and oils carry flavour, odour and fat soluble vitamins. They all have different functional and sensory characteristics.

Characteristics

- **Butter** – butter is not a pure fat, but an emulsion of water in oil.
- **Lard** – comes from pigs' fat. It is a useful shortening agent due to its plasticity.
- **Dripping** – is the fat which the meat 'drips', from being roasted. It has the flavour of meat.
- **Suet** – the fat around the organs of animals such as ox and sheep. It is solid and hard.
- **Fish oils** – have a high percentage of unsaturated fatty acids.
- **Vegetable oils** – may be a rich source of unsaturated fatty acids and usually contain natural antioxidants which resist rancidity.
- **Margarine** – is a solid emulsion of water in oil with a fat content between 80% and 90%.
- **Low fat spreads** – these spreads do not meet the minimum fat level (80%) to be called margarine. Water is used to bulk out the spread.

Functional properties

- **Shortening** – products such as shortcrust pastry, biscuits and shortbread rely on fat to coat the flour particles and prevents moisture absorption. This inhibits gluten formation which gives the products their characteristic crumbly or short texture.
- **Plasticity** – is where fats do not melt immediately but soften over a range of temperatures (unique to each fat). Some fats have been formulated so their melting points are low and they are spreadable straight from the fridge e.g. soft margarine.
- **Retention of moisture** – some fats can help retain a bakery product's moisture and increase its shelf-life. They may also be used to baste foods cooked by dry heat.

Storage

Fats should be stored in a cool place, covered and away from strong odours. They should be packaged to prevent oxidation. Oils should be stored at ambient temperatures in sealed containers. Oils that have been used need to be strained to remove impurities to prevent oxidation. Oils that have been used for deep frying frequently should be discarded.

Types and uses

- Butter** – as a spread, cakes, biscuits, sauces, fudge, pastry, ice cream
- Ghee** – frying
- Lard** – pastry, frying, roasting
- Suet** – suet pudding, dumplings, jam roly poly, sweet mincemeat
- Dripping** – basting, as a spread
- Sunflower oil, soya oil, corn oil, olive oil** – margarine, frying, salad dressing, ice cream
- Fish oil** – margarine, capsules (e.g. vitamin supplements)
- Coconut oil** – cream filling in biscuits
- Duck/goose fat** – roasting



EU Cooking Corner

Why not try making some of the following EU foods to help you learn to cook with fats and oils?

- Croissant
- Greek salad with olive oil dressing
- Mincemeat with suet in mince pies





MEAT

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Many different animals are consumed across the EU. The species, breed, age and part of the animal are all factors which contribute to the sensory and nutritional qualities of meat. Cuts of meat which are from muscle areas which do a lot of work will need longer, slower cooking methods (e.g. stewing). Cuts of meat from muscle areas not so heavily used by the animal can be cooked more quickly (e.g. stir-frying). Meat from the muscles of younger animals is tender as the muscles have been used less. Meat is a source of protein. The EU research project PROteINSECT is looking at the use of insect protein as a sustainable source of protein for animal feed and human nutrition.

Characteristics

- **Tenderness** – some varieties of meat are tough and may be hard to cut or chew. Tenderness can be improved by: mechanical action; chemical action; hydration (e.g. using an acidic solution to marinate meat) and cooking.
- **Colour change** – the colour of meat is due to a mixture of pigment in the muscle. The main pigment is called myoglobin. Muscles contain varying proportions of pigments. Muscles used for physical activity contain large quantities and are darker in colour.
- **Red meat** – as red meat is cooked the myoglobin changes from a purple red to a greyish brown in colour.
- **White meat** – poultry has less connective tissue than red meat so is usually more tender. The legs and wings, which do the most work, tend to be darker and tougher due to the myoglobin present. Other parts of the bird, e.g. breast, have less myoglobin and therefore become white during cooking.
- **Game** – game is generally tougher than poultry, beef, pork and lamb, due to their wild nature and having an active life.
- **Offal** – offal is defined as any part of a dead animal other than the carcass meat (except hide and skin). It includes kidney, brain, tongue, tail and feet.

Storage

Fresh meat should be eaten within a few days of purchase or frozen. It should be covered and stored in the bottom of the refrigerator away from food which will not be cooked before being eaten, to avoid cross contamination.

Types of meat

Beef/veal – e.g. rump steak, brisket, loin of veal



Lamb/mutton – e.g. chops, shoulder, shank

Pork/bacon – e.g. chops, gammon steak, spare ribs

Poultry – e.g. chicken, duck, goose

Offal – e.g. kidney, liver, tripe

Game – e.g. pheasant, rabbit, venison.

There is also a market for **horse** and **goat** meat in some European countries.

Meat Products

A wide variety of meat products are readily available, e.g. curries, pies, burgers and paté. Gelatine and stock cubes are by-products of the meat processing industry.

EU Cooking Corner

Why not try making some of the following EU foods to help you learn to cook with meat?

- Hamburger steak (Hakkebøf)
- Pork chop (Kotlet schabowy)
- Spaghetti bolegnese





MILK AND MILK PRODUCTS

Milk has been derived from many types of mammals and put to different uses over the centuries. This has resulted in the development of a number of by-products of milk itself, including butter, cheese, cream and yogurt. Commonly consumed animal milks include cows', ewes' and goats' milk. A range of non-animal milks are now available including rice, oat, soya, hemp, coconut, almond and hazelnut milk.

Processing

Most milk undergoes some form of heat processing such as pasteurisation, sterilisation or ultra high temperature (UHT) treatment to ensure harmful micro-organisms are destroyed before the milk is consumed and to improve keeping qualities.

Characteristics

- Milk – when heated, a skin may develop on the surface of milk due to the coagulation of proteins. To avoid this, the milk should be agitated (e.g. whisked).
- Cheese – overcooking can cause cheese to become tough and rubbery as the protein shrinks and squeezes out fat and water (syneresis). When adding cheese to sauces, grate or cut into small pieces and add at the end of cooking so it can melt quickly, without any lumps.
- Butter – butter can be used for a variety of functions including aeration (e.g. in cake making), shortening (e.g. in shortcrust pastry making), flavouring (e.g. in sauces) and for the retention of moisture (e.g. in bakery products).

Storage

Most milk and milk products should be stored in a refrigerator to slow down the growth of micro-organisms e.g. mould growth on cheese. Milk, cheese and yogurt, once opened, should be stored and used by the 'use by date' on the packaging.

Types

Milk:

Animal milk – cows: fresh milk (whole, semi-skimmed, skimmed), dried, UHT, condensed, ewes', goats

Non-animal milk – soya, almond, hazelnut, coconut, hemp, oat, rice

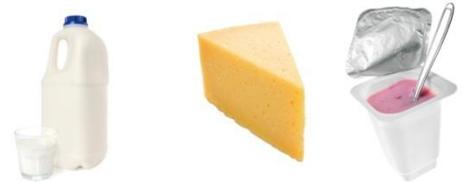
Milk products:

Cream – single, whipping, double, clotted, sour, crème fraiche

Cheese – Brie, Gouda, Stilton, Cheddar, Cottage, Ricotta

Yogurt – Greek, bio, set, natural, flavoured

Butter – unsalted, salted, flavoured (e.g. garlic)



EU Cooking Corner

Why not try making some of the following EU foods to help you learn to cook with milk and milk products?

- Blancmange
- Lasagne
- Bread and butter pudding





FISH

There are many different types of fish available in European seas. Fish move across borders and seas, and fishing fleets have done the same for centuries. As the activities of each fishing fleet affect the opportunities of other fleets, the EU countries manage their fisheries in collaboration through the common fisheries policy. Aquaculture (farming finfish, shellfish and aquatic plants) accounts for approximately 20% of fish production in Europe.

Characteristics

- **Fat content** – oily fish have more than 5% fat in their flesh, e.g. sardines, salmon. White fish have less than 5% fat in their flesh, e.g. cod and halibut.
- **Tenderness** – fish muscle is composed of short segments of fibres therefore does not need to be tenderised. The segments are easily broken and care needs to be taken when preparing and cooking fish.
- **Cooking** – fish can be cooked very easily and quickly. Cooking improves colour and flavour whilst destroying harmful bacteria. Some fish is eaten raw, e.g. sushi.
- **Preservation** – fish begin deteriorating as soon as they are caught. Most fish are put on ice or frozen to halt this process and increase their shelf-life. Possible methods of preservation include salting, marinating, drying, smoking, canning and freezing.

Processing

Fish can be reformed into blocks and frozen. These blocks are usually made of fillets. Minced fish, which can be used to fill up space in fillet blocks, comes from the trimming of fillets and recovery from the skeleton.



Fish products

Much of the fish that is bought by consumers has been processed, such as frozen fillets or manufactured coated fish products (e.g. fish fingers).

Storage

Raw fish should be cooked, chilled or frozen as soon as possible. Fish products should be stored as directed on the packaging.

Types

Freshwater – e.g. salmon, trout



Sea water:

Pelagic – These swim near to the surface of the sea e.g. herring, mackerel, sprat, sardines



Demersal – These swim close to the sea bed, e.g. cod, haddock, plaice and sole

Shellfish – molluscs e.g. cockles, winkles and mussels, and crustaceans e.g. scampi, prawn and crab.



There is also a market for squid and octopus in some EU countries.

EU Cooking Corner

Why not try making some of the following EU foods to help you learn to cook with fish?

- Fried plaice (Stegt rødspætte)
- Fish pie
- Seafood paella





SUGAR

Sugar can be produced from sugar beet or sugar cane. Sugar beet is grown in Europe whereas sugar cane is grown in tropical climates and imported.

Processing

Sugar is extracted from sugar beet or cane, refined and crystallised into a variety of white and brown forms. The residue from sugar production is molasses, a strongly flavoured, almost black syrup which can be clarified to form treacle. Golden syrup is a partially inverted syrup manufactured from intermediate sugar liquors from the refining process. Honey is produced by bees from nectar and its flavour depends on the flowers the bees visit. Honey is extracted from wax honey-combs by spinning or heat extraction. Brown sugar commonly starts off as refined white sugar which is then coated with molasses to make it brown.

Functional properties

- **Sweetness, flavour and texture** – sugar can be used to sweeten many products, e.g. drinks, cakes, confectionary, baked beans. Sugars can also contribute to the texture and mouthfeel of products, e.g. ice cream.
- **Aeration** – during the creaming stage of cake making, air is incorporated into the mix. Caster sugar is most suitable due to its fine crystal structure and as it inhibits gluten development in flour, helping the cake achieve a light texture.
- **Preservation** – high concentrations of sugar prevent the growth of microorganisms. Sugar is used extensively in jam and marmalade manufacture.
- **Bulking** – sugar may be used to increase a product's size, volume or weight which can give body or mouthfeel to the product.
- **Gelling** – sugar plays an important role in jam making. The setting of jam depends on having pectin, acid and sugar in the correct proportions to form a gel.

Storage

Sugar, honey and syrup should be stored in air tight containers to prevent moisture entering, or moisture loss and caking in the case of brown sugars.

Types and uses

Caster - cakes, swiss roll, meringue, shortbread, fruit pie filling, syrup

Demerara – fruit crumble topping, rich fruit cake



Icing sugar – royal icing, fondant icing

Granulated – mincemeat filling, cakes, sauces, macaroons, jam, ice cream, soft drinks, chutney

Soft brown sugar – bakery items, fudge

Honey – cake, flapjacks, cereals

Golden syrup – flapjacks, tarts

Treacle – rich fruit cakes, spicy sauces



EU Cooking Corner

Why not try making some of the following EU foods to help you learn to cook with sugar?

- Victoria sponge cake
- Dresden fruit loaf (Dresdner stollen)
- Meringue





FRUIT AND VEGETABLES



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Fruit and vegetables have adapted to local climatic and geographic conditions all over the world, which has resulted in many different varieties. With modern distribution systems, it is now possible to obtain fruit and vegetables all year round, from many different countries. It is also possible to extend the growing periods of fruits and vegetables.

Processing

Primary processing is required of fruits and vegetables, e.g. cleaning and trimming, peeling, chopping and washing. Fruits and vegetables can be canned, frozen, pickled, juiced or eaten raw. The processing of fruits and vegetables can alter physical characteristics and lead to losses of nutrients (e.g. vitamin C). Cut or shredded fruit or vegetables have a shorter shelf life than those which have not been processed.



Characteristics

Cooking – during cooking the cell structure starts to break down, which is why raw fruit and vegetables become softer when cooked. Some nutrients are also lost due to the loss of water and other solubles in the sap.

Colour – fruits and vegetables contain natural colour pigments which may be used to colour foods, however the stability of the pigments is affected by pH, light and heat.

Spoilage – the acidic nature of fruits and vegetables acts as a natural protection against spoilage by microorganisms. However the sugar content, carbon dioxide production, temperature and ripening nature can make them susceptible to spoilage.

Storage

Fresh fruit and vegetables should be used as soon as possible. If stored, they should be kept in a cool, dark place to prevent sprouting, mould growth and rotting.

Types

Fruit types

Soft fruits – e.g. raspberry, blackberry, redcurrant

Citrus fruits – e.g. orange, lime, grapefruit

Stone fruits – e.g. plum, lychee, mango

Fleshy fruits – e.g. apple, papaya, pineapple,

Vine fruits – e.g. grape, watermelon, cantaloupe



Vegetable types

Fruit vegetables – e.g. aubergine, plantain, tomato

Pulses – e.g. pea, bean, lentil

Flower vegetables – e.g. broccoli, cauliflower

Leafy vegetables – e.g. spinach, cabbage, parsley

Stem vegetables – e.g. asparagus, fennel, celery

Fungi – e.g. mushrooms

Tubers – e.g. potato, sweet potato, yam

Bulbs – e.g. onion, garlic, leek

Roots – e.g. beetroot, carrot, parsnip



EU Cooking Corner

Why not try making some of the following EU foods to help you learn to cook with fruit and vegetables?

- Vegetable soup (Gemüsesuppe)
- Pumpkin pastry (Tikvenikb)
- Apple charlotte (Æblekage)



CEREALS

All cereals are members of the grass family and there are many types of cereal which are consumed and used in the manufacture of food products in Europe. Each cereal has unique properties which make it suitable for a variety of food products. Cereals require different conditions to grow. For example, rice is grown in damp tropical climates such as in India and China and oats are grown in cold temperate climates such as in Scotland.

Processing

- **Wheat** – wheat is usually ground to flour, which can be used to produce a wide range of products. The type of flour produced differs according to the extraction rate.
- **Maize** – maize may be processed to make many different ingredients and food products. It can be milled in a similar process to wheat, or its germ can be refined to produce corn oil.
- **Rice** – there are many different types of rice which can be categorised by size, shape and region where they are grown. Brown rice has its outer husk removed and white rice is milled and polished further to remove the bran and germ.
- **Oats** – oats are rolled during processing and coarse, medium and fine grades of oatmeal are available.
- **Rye** – rye contains little gluten so produces breads with a low volume and dense texture.
- **Rapeseed** – rapeseed is mainly cultivated for its oil rich seed.
- **Barley** – mainly sold as pearl barley which is the whole grain with its husk removed.

Functional Properties

- **Protein** – bread's characteristic open texture and appearance relies on high protein flour e.g. wheat and rye flour. In products such as cakes, biscuits and pastry, low protein cereals are used to produce crumbly and light textures.
- **Gelatinisation (thickening)** – when a flour is added to a liquid the starch granules begin to swell on heating, eventually rupturing and releasing starch into the liquid. The starch granules absorb liquid and cause the sauce to thicken.
- **Bulking** – cereals such as rice and oats are sometimes used to 'bulk' a food product, e.g. vegetarian burgers

Storage

Cereals should be kept in a cool, dry place. They are prone to infestation by insects if kept for long periods of time.

Types and primary processing

Wheat – grains, couscous, flour



Maize – whole, grains, flour, oil

Rice – grains (white, brown), flour

Oats – grains, flour, rolled oats, oatmeal



Barley – grains (pearl barley), malt

Rye – grains, flour

Rapeseed – oil

EU Cooking Corner

Why not try making some of the following EU foods to help you learn to cook with cereals?

- Rice pudding
- Viennese Schnitzel (Wiener Schnitzel)
- Pumpernickel Bread (Pumpernickel Brot)





POTATOES



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Across the EU there are many different varieties of potatoes. They can be round, oval or elongated in shape, white, pink or red in colour and have varying numbers and depths of eyes. All these determine the end uses of the potatoes. Potatoes are a commonly consumed staple food in the diets of many Europeans. Some varieties of potatoes have acquired PDO (Protected Designation of Origin) or PGI (Protected Geographical Indication) registration, including Jersey Royal potatoes (PDO – UK), Pomme de terre de Merville (PGI – France) and Opperdoezer Ronde (PDO – Netherlands).

Characteristics

- **Potato type** – the type of potato that is used in the manufacture of a food product is of extreme importance. Manufacturers need to know that the products they make are of a uniform and consistent quality.
- **Colour** – freshly peeled or cut potatoes will start to discolour if exposed to air. This is due to the enzymic browning of the potato. Potatoes should be prepared as required or kept in cold water for short periods to prevent browning. If frozen products are to be produced, e.g. chips, the potato pieces need to be blanched in boiling water.

Processing

Where potatoes are to be canned, dehydrated or made into products, further processing is required, e.g. cleaning, peeling, chopping and washing. The processing of potatoes may alter their physical characteristics and lead to losses of nutrients (e.g. Vitamin C) which may be added to dehydrated products after processing. The potato is processed into granule, flake or powder form.

Functional properties

- **Thickening** – potatoes may be added to soups, stews and casseroles to thicken the mixture. Potato starch is used industrially to thicken instant dessert mixes and canned soups and in the manufacture of extruded snacks.
- **Bulking** – boiled or mashed potatoes may be used to form the bulk of/extend food products. This may reduce the cost of a product, e.g. economy fish cakes.

Storage

Potatoes should be stored in dark, cool and dry conditions to prevent them sprouting, becoming mouldy and changing colour.

Types and uses

Potatoes can be divided into **waxy** or **floury** potatoes. A floury potato will have a much higher dry matter than a waxy potato. There are many different varieties of potato, for example:

Agria – crisping, processing (starch/flake)

Desiree – boiling, roasting, baking, chipping

Maris Piper – boiling, roasting, baking, chipping

Record – crisping



Products

Potatoes can be manufactured into a variety of products, including chips, potato waffles, hash browns, croquettes and canned new potatoes.

EU Cooking Corner

Why not try making some of the following EU foods to help you learn to cook with potatoes?

- Potato dumplings (Kartoffelknödel)
- Zeplins with meat (Cepelinai Su Mésa)





EGGS



The European Union is the world's second largest egg producer. Eggs are graded by size and quality to European Union regulations. Only top quality 'A' grade eggs are available to the consumer, with grade 'B' and 'C' being used in manufacturing. All 'A' grade eggs sold at retail level and public markets within the EU must be stamped with a code identifying the:

- method of production, e.g. organic, free range, barn or cage;
- country of origin;
- hen laying establishment.

There are a few exceptions - the regulations do not apply in full to hen eggs sold directly to the consumer for their own use: by the producer on their own farm, by the producer through door-to-door selling or by the producer in a local public market.



Functional Properties

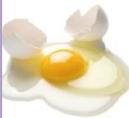
- **Coagulation** – when eggs are heated, the protein in the white and yolk starts to coagulate and the liquid egg becomes firmer. As heating continues the egg eventually becomes solid. Boiled, poached, fried and scrambled eggs all demonstrate this process.
- **Thickening** – a sauce or custard can be thickened by adding egg and heating. This also enriches the sauce by adding extra nutrients.
- **Binding** – whole raw egg adds moisture to a mixture and holds the ingredients together, e.g. rissoles. As the food is heated, the egg coagulates and keeps the product whole.
- **Coating** – egg enables coating such as breadcrumbs to stick to the surface a product. The egg helps the coating to adhere to the product's surface and forms a protective barrier during cooking.
- **Glazing** – egg can be brushed over the surface of a bakery item prior to baking to give a glossy golden brown finish.
- **Emulsification** – egg yolk contains lecithin which acts as an emulsifier. It can be used to stabilise emulsions. Adding egg yolk to a mixture of oil and water prevents the two liquids from separating, e.g. mayonnaise, an emulsion of oil and vinegar is held together by egg yolk.
- **Foaming** – whisking egg white incorporates air and produces a foam - a relatively stable mass of bubbles. If left to stand, the foam will gradually collapse, but when heated the foam becomes permanent, e.g. meringue. Whole egg incorporates air less well, but gives sponge cakes a light texture.

Types

Hen, duck, quail and goose eggs are available for human consumption.

Cooking methods

- Fried egg
- Scrambled egg
- Poached egg
- Soufflé
- Omelette
- Boiled egg



Size classification

Size of egg range	Weight
X (very large)	73g and over
L (large)	63g up to 73g
M (medium)	53g up to 63g
S (small)	Below 53g



EU Cooking Corner

Why not try making some of the following EU foods to help you learn to cook with eggs?

- Meringue
- Tortilla
- Scotch eggs



MEAT ANALOGUES

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Some people choose not to eat meat for a variety of reasons and obtain all their protein from other sources. Manufacturers have produced many meat-like products, called 'meat analogues', which mimic the sensory properties of meat and can be used to replace or extend meat in traditional products, e.g. textured vegetable protein (TVP) and myco-protein.

Characteristics

- **Textured Vegetable Protein (TVP)** is composed of bundles of short fibres of extruded soya protein. Plain TVP may have a 'beany' taste, so needs to be flavoured. Varieties of flavoured TVP are available.
- **Tofu** is produced from ground soya beans, which have been sieved. The proteins coagulate, producing a soft cheese-like product. Tofu is semi-solid and is available in plain and smoked form. As it is quite soft, it absorbs flavours well. It does not have a meaty texture, yet may be used for many dishes as a substitute for meat.
- **Tempeh** is a mass of soya beans, which have been allowed to ferment. It is solid, has a white fluffy outer layer and can be sliced. It may be flavoured and cooked in a variety of ways.
- **Myco-protein** is produced by fermentation of a particular organism (*Fusarium graminearum*) to produce fine fibres, which are formed together to produce a meat analogue. It has similar textural properties to meat and contains a small amount of fibre. The myco-protein undergoes forming, cutting and texturing according to the nature of the product to be made. Myco-protein absorbs flavours well and may be cooked in many different ways.

Functional properties

Bulking – meat analogues may be used to 'bulk' or extend food products. Some ingredients, such as TVP, may be used to reduce the cost of a product, e.g. economy cottage pie.

Storage

Dried TVP should be kept cool, in an air-tight container away from direct sunlight. Tofu, Tempeh and myco-protein should be kept in a refrigerator or freezer unit until needed.

Types and uses

Textured vegetable protein – plain, flavoured, minced, in lumps. Used in sausages, burgers, pasta dishes.



Tofu – plain or smoked. Used in stir fries or steamed.

Tempeh – used in stir fries or steamed.

Myco-protein – minced, in lumps, formed. Uses savoury sauces, pies and pasties.



EU Cooking Corner

Why not try making vegetarian alternatives of the following EU foods to help you learn to cook with meat analogues?

- Spanish sausage and bean casserole (using myco-protein sausages)
- Tofu quiche

