

Home Economics

Health and Food Technology

Consumer Studies

[HIGHER]



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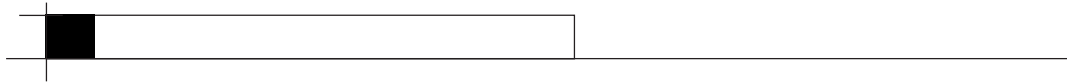
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SECTION 1**The consumer within the European dimension****Elaboration**

- Definition of a European Directive
- Example of legislation covered by European Directives: 'e' mark on pre-packed foods
- Prescribed quantities for tea, coffee, sugar, butter, margarine
- Metric measurements used for food sales
- Food labelling including additives identified by 'e' numbers

The influence of European Directives on the consumer**What is a European Directive?**

- A European Directive is a form of EU regulation designed to ensure a common set of rules and regulations are followed throughout all EU states.
- An outline plan which instructs member states what they should do in terms of policy to ensure consistency throughout EU states.
- A Directive is an outline plan only and instructs member countries what **should** happen but leaves the decision up to individual state governments as to how to do it.

Background to the influence of EU Directives on consumer law in the UK

On becoming a member of the EU, the UK was obliged to sign the Treaty of Rome. Amongst other things this included agreement that the member states would cooperate to produce a common set of trading laws ostensibly for the benefit of the consumer in these countries. Prior to EU membership the UK (and other countries) had its own legislation and in some areas it was superior to other EU states.

At present if the member countries can reach agreement regarding what the various laws should include then these are accepted and implemented throughout the member states. This is the function of the Council of Ministers and a UK government minister from the appropriate department affected by the possible change will attend. (The Council of Ministers may reject the agreed proposals, however.)

Certain other EU bodies are consulted, i.e. the European Parliament and the Economic and Social Committee (ECOSOC). The Consumers' Consultative Committee and Consumers in the European Community Group have been set up to consider the interests of ordinary consumers and/or make representation on their behalf.

The purpose of a European Directive is

- To make a common set of trading laws throughout all EC states.
- To try to harmonise and create common standards instead of having separate rules or standards. In certain instances this has meant changing some of our national laws and because of this some decisions which affect our lives are made within other EU countries. As we want to belong to the community this means we have to be prepared to compromise. Obviously this makes the law-making process very complicated and it often takes a long time.
- To give an outline plan for proposed legislation in the member countries of the EU.

The following are some examples of areas where we have been affected by EU policy.

Food standards

Traditionally food standards vary between countries, e.g. the use of different ingredients in the same named product (chocolate in the UK consists of different ingredients to continental chocolate).

After 1992 any product legally made and sold in one country can be sold in another member country. National laws not based on EU laws will still apply to national products but cannot be used to keep our products legally available in other EU countries.

Influence of the EU on food law

Weights and measures

- The change from the UK minimum weight system to an average weight system indicated by the 'e' mark (e50g, for example) for pre-packed goods.

The European system of weights and measures uses an average weight system to control weight markings. It means that a few packages are allowed to contain slightly more or less than the stated quantity as long as the total number averages out to that amount.

Goods which have been packed using the average weight system will use this label. It is the EU symbol showing that the packer is measuring the European way. This symbol is understood throughout other member countries.



- Standard packaging where goods are sold in prescribed amounts/sizes – many basic foods can only be sold in pre-determined constant qualities, for example tea, sugar, coffee, butter and margarine and this enables the consumer to compare prices of these commodities readily.
- Food sold pre-packed should show weights in metric measurements – kilograms and grams rather than pounds and ounces.
- Manufacturers of detergents have adopted standardised packaging for washing powder, e.g. e1 to e10, again enabling the consumer to compare prices readily.

Additives

In most EU countries the use of additives is controlled. Additives in the UK have been strictly tested. The European Directives have:

- Set a list of authorised additives for use in the EU – the countries each have a list of substances which experts consider are safe to use.
- Stipulated how additives must be tested on food labelling, i.e. e number with additive category.

Food labelling

- All food must now be clearly marked with its name and description and most pre-packaged food must show a list of ingredients and how long it can be kept.
- In the ingredient listings all additives (except flavourings) must be identified by their e numbers and the type of additives they are must be indicated, e.g. colouring, preservatives, etc.
- In addition, EU restrictions are placed on which additives are permitted in food, i.e. there is an approved list of additives considered safe for use.
- Sets out details with regard to products which have a low energy/ reduced energy claim.
- Food packages must be sold in metric weights.
- Pre-packed food products should carry a date of minimum durability. This would normally be a 'best before' date, which is the date up to and including which the food will be in the best condition.

- A 'use by' date should be used on pre-packed foods that are microbiologically highly perishable and could be a danger to the consumer's health.
- Where the use by date is indicated, it must be followed by a description of good storage conditions.
- Standardised format for inclusion of the optional nutritional labelling of food items.
- The EU is keen to harmonise standards for processed foods and a number of these proposals have been very contentious because different EU members/consumers have their own ideas about what they are used to.

An EU Directive 2003 which came into force in 2004 has clarified some aspects of food labelling and ingredients. Food manufacturers are required to list 12 potentially allergic ingredients. The allergens include cereals containing gluten, fish, crustaceans, peanuts, soy, milk and dairy products, nuts, celery, mustard, sesame seed and sulphites. The list of allergenic food ingredients will be updated as required on the basis of recent scientific knowledge. The Directive underlines the principle that all ingredients should be listed clearly on labels whenever they are used in pre-packed foods. Labels will also need to give clear information about ingredients made from these foods, for example, a glaze made from eggs.

The aims of this Directive are:

- To give a high level of health protection to consumers – many consumers suffer allergy conditions ranging from very mild to potentially fatal.
- To ensure that all consumers are appropriately informed as regards foodstuffs through the listing of all ingredients.
- To provide consumers who have allergies or intolerances with more comprehensive information on the composition of foodstuffs.

SECTION 2**Food politics****Elaboration**

- Use of food additives
- Genetically modified foods (GM)
- Organic foods
- Irradiated foods
- 'Fair Trade'™ products

Use of food additives**Definition**

- Additives are natural or synthetic substances which are added to foods to serve a particular purpose
- These are substances which are not normally or naturally present in foods.

Additives used in the UK have been strictly tested. An 'E' number indicates that the additive has been accepted as safe by the countries of the European Union. Although many manufacturers may promote their products as 'additive free', additives do give some advantages to the consumer

Advantages to the consumer – general points

- Foods have a longer shelf-life and so the consumer can store the products for a longer period of time.
- The aesthetic value of the food is improved by the addition of additives such as colourings. If not added, many foods would look unpleasant.
- Food is safer for longer periods of time as micro-organism infections are reduced. This reduces wastage.
- Prevents the consumer having to do a lot of shopping daily, as foods can be safely bought and stored for an extended period of time.
- An increased range of foods are available in an easy to prepare convenience form. This is useful for consumers who are busy and have less time to spend preparing foods than in the past.

- The development of a wide variety of new foods that would have previously been unable to be developed has increased variety in the diet.
- Flavourings and colourings replace what has been lost in the processing or give the food qualities it did not have before.
- Many new lower-fat products would not be available without the use of additives.
- Uniform products are produced during large-scale manufacture. Foods are more consistent with additives so that jam made in one factory is similar to that in another factory – flavour, colour, viscosity are always the same, since the additives are very carefully measured, usually computer controlled, no matter where the jam is made.
- Nutrients such as vitamins and minerals can be added to fortify products, therefore, making a more nutritious product for the consumer.
- There is a permitted list of additives which have been tested and, therefore, the consumer can be reassured about the safety of the product.

Disadvantages to the consumer – general points

- Some additives can cause hyperactivity in children and irritate sufferers of asthma and eczema – parents may have concerns and many people now look for additive-free foods.
- Some people are sensitive to certain additives and must avoid them, e.g. tartrazine (e102), a colour additive that has been linked to food allergies.
- New additives are expensive to develop – this can mean that the higher cost is passed onto the consumer.
- Some additives are thought to cause health problems and induce cancers.

Types of food additives

Preservatives

- Additives are found in bacon, ham and meat that has been cured.
- Additives are used in baked goods, soft drinks and fruit juices.
- Vinegar and sulphur dioxide in jam, alcohol, sugar and salt are all used as preservatives.

Benefits to the consumer

- Help to keep food safer longer by protecting it from micro-organisms (bacteria, fungi and moulds).
- Lengthens the shelf-life of foods.
- Enables manufacturers to transport food in bulk which is cheaper and keeps cost down.
- Protects food from contamination by micro-organisms.
- Prevents wastage of foods for retailers/consumers as shelf-life is extended.
- Can be added to some fruits, e.g. apples to prevent browning or unpleasant discoloration.

Antioxidants

- Additives prolong the shelf-life by stopping fatty food from going rancid.
- Additives protect fat-soluble vitamins from combining with oxygen.
- Additives are used in dried soups, cheese spreads and sausages.
- Ascorbic acid (vitamin C) is a natural antioxidant that is found in fruit and preventing other fruits going brown, e.g. lemon juice stops peeled apples going brown.

Benefits to the consumer

- Prolongs shelf-life of foods by protecting against deterioration caused by exposure to air.
- Prevents fats becoming rancid so extending shelf-life/preventing waste/preventing unpleasant flavours which make food unpleasant to taste.
- Prevents colour changes in certain products so maintaining their aesthetic appeal.

Sweeteners

- There are two types of sweetener additives: intense sweeteners and bulk sweeteners.
- Intense sweeteners (artificial sweeteners) such as saccharin and aspartame are many times sweeter than sugar and only a little is needed.
- Bulk sweeteners such as hydrogenated glucose syrup are used in the same sort of quantities as sugar.
- Some sweeteners are thought to cause health problems.

Benefits to the consumer

- Added to enhance the sweetness of foods, so preventing use of sugar.
- Added to give the product a reduced sugar content, so allowing health claims/dietary target claims/reduced calorie intake.
- Useful to people on low-calorie diets who are trying to lose weight.
- Added to products, as they are safer to teeth than sugar and so will encourage sales if this benefit is highlighted.
- Can be added to products such as jams, to allow diabetics to eat the food.

Flavourings/flavour enhancers

- These are used to restore flavours lost in processing.
- They simply add flavour to foods, e.g. vanilla ice-cream.
- They must comply with the Food Safety Act 1990.
- Monosodium glutamate (MSG) is a flavour enhancer used in many Chinese meals and savoury meals; it has no flavour of its own but intensifies the flavour of other foods but it has an aftertaste that is disliked by many people.
- A small number of people may be allergic to MSG; many manufacturers are now replacing it with herbs, spices and other seasonings.

Benefits to the consumer

- Makes flavours in some foods stronger.
- Added to foods in small amounts to improve taste.
- Added to foods in small amounts to give odour.
- Used to produce artificial flavours in foods where 'real' flavours may add to cost (e.g. yoghurt).
- Used to add flavours to foods which, when processed, could not replicate natural flavour.

Colourings

- Additives make food look more attractive, e.g. during processing peas turn brown and colouring additives can make them green again.
- Caramel (e150) is the most popular colouring and is used in, for example, cola.
- Baby foods are only allowed to contain the three colours which are also sources of vitamins and these are probably the most controversial group of additives, as many people seem to be allergic to them, especially some children who can become hyperactive after consumption.
- Forty-six colouring additives are used in the UK and most are natural; 17 are artificial.

Benefits to the consumer

- Restores the colour lost due to processing, so improving the appearance.
- Enhances the colour of certain foods to make them more attractive.

Emulsifiers/stabilisers

- These help to mix ingredients together which would normally separate and so cause production problems.
- Additives allow fats and oils to mix with water to make low-fat spreads and salad dressings.
- They give food a smooth and creamy texture.
- They help improve shelf-life of baked goods.
- Lecithin, found in eggs, is a natural emulsifier used for mayonnaise and low-fat spreads.

Benefits to the consumer

- Stabilisers prevent the ingredients separating again, so maintaining a good product.
- Allows the manufacturer to produce a product which can remain stable on the shop shelf/during transport/distribution.
- Improve the consistency of the food.
- Produce special characteristics required in certain products, i.e. viscosity of the product (thickness or thinness)/smoothness and stability.
- Help produce 'healthy' products, e.g. low-fat spreads, and so contribute to consumer's health.

Other types of additives

- Raising agents such as sodium bicarbonate are used to lighten baked products.
- Thickening agents are used to form a gel to thicken sauces.
- Nutrients such as vitamins and minerals are used to enrich certain foods such as breakfast cereals.

Genetically modified (GM) foods

Genetic engineering is closely linked to biotechnology and opens up very wide possibilities for changes to be made to our food in numerous areas. However, like many technological advances it carries environmental, social, moral and health implications.

Publicity regarding genetic engineering in the fields of medicine and in plant and animal breeding programmes has been widespread recently.

What is genetic engineering?

All the information about a plant or animal, including its colour, size, shape and growth is carried in its genes. This information is passed on to the next generation of plant or animal when it reproduces. When it is genetically modified, a plant's genetic material is altered (or a gene is transferred from another organism) in order to produce certain characteristics.

Some examples of the use of genetic modification include:

- GM crops such as flour from GM maize, soybean products and oil-seed rape.
- GM technology is used on bacteria and yeasts that make processing aids used in cheese, beer, bread and food additives.
- GM ingredients are used in some animal feed. Animals fed on this yield meat and dairy produce and so enter the human food chain.

Genetic modification is thought to have many implications for economic development throughout the world and could result in many changes throughout the agricultural and food-processing industries.

Many consumers are against the principle of genetic engineering and have expressed concern about the lack of clear labelling. Foods that contain GM ingredients or derivatives should be stated on the label. However, there is an exception. The law states that foods can contain a small amount of GM material (9 per cent) without being labelled as GM – as long as manufacturers can prove that they have tried to prevent this. This has been permitted as it is very difficult to separate GM and conventional crops and as a result it is extremely difficult to guarantee that some GM materials will not end up in processed foods

Much debate exists about the concerns and benefits of GM foods to the consumer.

What are the consumer's concerns?

- May have moral, religious or cultural problems with using foods which have been modified using genes from animals which are forbidden in some religions.
- Muslims, Sikhs and Hindus have ethical objections to consuming organisms which contain copy genes from animals that are included in dietary restrictions for their religion.
- Strict vegetarians would object to using copy genes of animal origin in a plant.
- Concern that food should be natural and not be tampered with.
- Fear of the unknown and the new, in terms of ensuring that such developments will not affect the quality and safety of the food and long-term health effects on consumers
- May be concerned about the environmental aspects of genetic modification and so not buy the food – genetically engineered plants and animals could affect wildlife.
- May be concerned about the ethical aspects of genetic modification and so not purchase food – the welfare of animals could be at risk.
- Legislation is needed to require genetically modified foods to be clearly labelled so that consumers can make informed choices

Benefits to the consumer

- Reduces losses in the supply of certain food items such as crops and so results in a constant supply of food and so more stable prices of food. Less waste.
- Can improve the nutritional value of foods by manipulating the genes in the food by, for example, increasing the protein content in food and so benefiting consumers.
- Can assist in the preservation of food by preventing the ripening of fruits and vegetables enabling a longer shelf-life and increasing nutritional benefits.
- Can produce foods in greater quantities and so ensure supply (e.g. milk). May mean a lower/more stable price of food items.
- If combined with clear labelling, it allows consumers to make choices concerning the purchase of such products.
- Can help to modify foodstuffs to meet consumer demands, e.g. leaner meat to help meet dietary targets.
- Can increase the variety texture, appearance of food and so increase consumer choice.
- Can increase the shelf-life of fresh foods without the use of preservatives or additives; therefore, nutritional benefits can be gained without any possible additive allergies.

- Vegetarian cheeses can now be produced, therefore, increasing important nutrient intake for vegetarians.
- Some fruit and vegetables can be modified to contain higher level of nutrients, e.g. vitamins C and E. These vitamins could offer some extra protection against CHD and some cancers.
- Lack of protein is a major cause of malnutrition in many countries of the world – protein could be increased in rice, therefore, helping malnutrition in poorer countries.
- Foods may be altered to produce additional health benefits, e.g. HBV protein and low in saturated fat, low in calories and a useful source of NSP.
- Improvement in quality, flavour, crunchiness and texture of a wide range of foods, e.g. potatoes, tomatoes.

Campaigners admit there is no evidence that genetically modified food will be unsafe but want a comprehensive system of labelling so that consumers are aware of what they are buying. This has been backed by the Consumers' Association and the National Consumer Council. The Genetics Forum believe that supermarkets are duty bound to label food resulting from genetic engineering. Many supermarkets do not stock genetically modified foods due to lack of evidence of the long-term effect on health.

Organic foods

Definition

- The term 'organically grown' when applied to meat, dairy products, fruit and vegetables should mean that the products have been produced without the aid of artificial chemicals or hormones. Organic foods should be produced naturally, using animal and vegetable manures. The group of people who choose these foods may even be frightened that man-made chemicals could contain carcinogens (cancer-forming agents).

There is a big demand for organic food despite the fact it is considerably more expensive than conventionally farmed products.

Why do organic fruit and vegetables cost more?

- **Packaging costs.** Because organic fruit and vegetables have to be kept separate so that they do not get mixed up with conventional fruit and vegetables, most are packaged. This adds to the cost.

- **Farming methods**

- (a) The price of organic food is also pushed up by the traditional farming methods on which it relies. Organic farming prohibits the use of man-made fertilisers, pesticides, growth regulators and feed additives. Instead, it uses animal and plant manures, crop rotations, biological pest control and mechanical weeding (conventional growers spray on herbicides to kill weeds).
- (b) Organic farms tend to be smaller and so their scale of production is smaller. They also rely on crop diversity (planting several different crops) rather than concentrating on a single crop. They use this crop diversity, as well as crop rotation, to build up soil fertility. But this means it is not always economic to use large specialised, and often expensive machinery for harvesting and packing produce. Using more manual labour and less efficient machinery increase costs.

- **Storage and transport**

After harvesting, produce is usually stored. Conventional farmers often use post-harvest treatments to prevent pests, moulds and other damage to their food while it is in store. Organic farmers don't use these treatments: instead they put their produce in cold storage. This costs more and is less reliable so organic farmers can lose more of their produce than other growers at this stage. Even transporting and sorting organic food can be more expensive, mostly because of the small volumes involved.

Advantages of organic foods

1. Many people buy organic foods as they believe they taste better – as yet there is no consistent evidence that organic food does taste any better.
2. Organic products use fewer fertilisers and chemicals. Consumers may prefer products which use fewer fertilisers as some may be harmful to health/cause cancer.
3. People buy organic because they believe it is free from chemicals or pesticide residues and, therefore, better for health – there are fewer side effects or allergies.

4. Consumers may be reassured that they are causing less harm to the environment and so will select them in preference to non organic.
5. As the market for organic food is expanding, there will be increased competition so this may eventually mean a price reduction for the consumer.
6. More organic products are being developed and so the consumer will have a wider choice.
7. Organic foods may be more in keeping with some people's ethical beliefs and, therefore, will be chosen.
8. Several studies have shown higher levels of protein, vitamin C, calcium, iron and potassium in organic vegetables. But there is little conclusive evidence that organic food offers any significant nutritional advantage. The extra vitamins and minerals could be lost if the juices or cooking water are not retained.

Possible problem areas with organic foods

1. Organic foods tend to be expensive and are therefore not available to low-income groups.
2. Quality may be less uniform which may be unacceptable to consumers – because their appearance may be less attractive.
3. Maintaining quality may not be so easy due to the absence of pesticides or preservatives, etc. and so they have to be purchased more regularly.
4. Organic products are not completely fertiliser/chemical free – some fertilisers are still permitted in organic farming therefore some risk to health is still possible.
5. The evidence as to the health benefits of organic products are still not proven, therefore consumers may be paying high prices for no valid reason.
6. Regulation of organic products may be difficult, e.g. a jar of pasta sauce has many ingredients, therefore it would be difficult to ensure that each one is 100 per cent organic.

Irradiated foods

Definition

- The foods are given small doses of radiation while packed in cartons on a conveyer belt. Radiation is energy transmitted by electromagnetic waves or rays.
- It is called 'ionising radiation' and is similar to X-rays.
- When food is irradiated, energy passes through it and harmful bacteria are killed.

Consumer and other groups who monitor what is in the interests of the public still remain unconvinced of the total safety and control of this technological development. Since 1991 the irradiation of food from seven groups has been allowed in the UK. These groups are: fruit, vegetables, poultry, seafood, cereals and herbs and spices

Irradiated food has been used in the past for space travel and for hospital patients who need protection from infection.

By law, food which has been irradiated must be labelled as such – the word 'irradiated' has to be in a prominent position on the food label. Unfortunately it is difficult to enforce these regulations and as yet there is no reliable detection test which could monitor irradiated ingredients present in foods.

Labelling is compulsory throughout the EU, but it appears labels are **NOT** appearing and thus the process is not being controlled properly. With so much importing and exporting of foods, legislation regarding different countries' laws on irradiation is proving difficult.

Advantages of irradiated food to the consumer

- Reduces the bacteria which cause food spoilage and, therefore, increases shelf-life and reduces waste
- Delays the ripening of fruit and vegetables thus slowing down the natural decay process and increasing shelf-life of food.
- Extends refrigerated storage time and, therefore, may possibly increase the variety of foods in the diet by improving availability.
- Helps to slow down sprouting, e.g. potatoes, onions, delays ripening of certain vegetables, and kills pests so that food reaches the consumer in good condition.
- Reduces food spoilage micro-organisms, e.g. salmonella, listeria and campylobacter and, therefore, there is less risk of food poisoning and food is safer to eat.

- Exotic fruits can be prevented from ripening too quickly – those imported are of better quality and so the nutritive value is higher for the consumer.
- Reduces the need for chemical preservatives – this is a big advantage to those sensitive to chemicals.
- Irradiation can be used to help prevent accidental contamination in chilled meals.
- Irradiation can also be used to kill insects and pests that infest foods such as grain, herbs, spices and dehydrated vegetables without appearing to affect the foods themselves.
- It can completely sterilise a food, making it fit to eat for vulnerable patients in hospitals.

Disadvantages of irradiated food to the consumer

- It can be used on a very limited range of foods. The main types of food are meats, sea food, fruit and vegetables. The level of radiation is important, as even a slight overdose can result in food having an unpleasant taste and texture.
- It is still a relatively expensive technology.
- Irradiation reduces the nutritional quality of food but to a degree similar to other methods of preservation.
- Vitamins A, K, E, C and B are lost due to irradiation.
- Many food sellers, e.g. Marks & Spencer and Sainsbury's, have no intention at present of stocking irradiated food as they feel that their present storage, preservation and chilling methods are satisfactory.
- Many consumers associate irradiation with nuclear technology and, therefore, it is still not readily accepted.
- Some people believe that new and harmful chemicals are produced when food is irradiated and that not enough is yet known about the potentially harmful effects.
- There is no really effective way of identifying food which has been irradiated, so keeping checks and accurate labelling are difficult.
- It is true to say that the process will not destroy botulinum spores but then neither will any other pasteurisation process in current use. Similarly, it is true that micro-organisms may become resistant to irradiation; again this can arise with all pasteurisation processes.
- The method is liable to abuse. Irradiation could be used to 'clean up' food otherwise unfit to eat.
- Contamination can still occur in food after packing.

‘Fair Trade’TM products

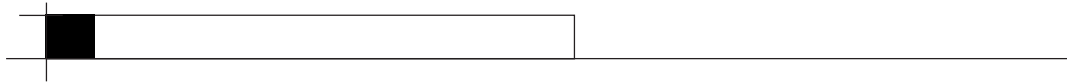
The purpose of the Fair TradeTM movement is to improve the wages and working conditions of workers in third world countries producing goods. Workers are paid a living wage which enables them to cover basic needs, including food, shelter, education and health care for their families. Paying fair wages does not necessarily mean that products cost consumers more. Since Fair Trade organisations bypass the middleman and work directly with producers, they are able to return a greater percentage of the selling price to the producer. The producer has the advantage that they use environmentally friendly practices which manage and use local resources. This gives the local community an incentive to preserve their natural environments for future generations.

Advantages to the consumer

- In some cases the quality of foods is actually higher because Fair Traders consider the environment when producing. For example, in the case of coffee, fairly traded coffee is usually organic and shade grown, which results in higher-quality coffee.
- The Fair Trade label is marked on food products. Therefore, consumers who are concerned with the environment and working conditions, for example child labour, in the third world will purchase these.
- There is an increasing range of food products at present for consumers to choose from – bananas, coffee, chocolate, tea, honey, snacks, biscuits, sugar, fruit juice, fresh fruit – in time this may expand further.
- Fair Trade encourages purchase through Fair Trade stores, supermarkets, catalogues and websites (non-perishable food such as tea, coffee), and so products are obtainable from a variety of sources.
- Generally, Fair Trade products do not cost any more than other goods because the large percentage taken by middle people is removed from the cost.
- Fair Trade organisations educate consumers about the importance of purchasing fairly trade products which support living wages and healthy working conditions.

Disadvantages

- In some cases, e.g. coffee, the producers receive a high price per kilo, and so the consumer would have to pay a higher price for Fair Trade coffees than for the other brands.
- Some shops may not stock these products or have a limited range.



SECTION 3**Factors which influence consumer choice of food****Elaboration**

- Advertising, marketing and promotional techniques
- Available income
- Climatic conditions
- Cultural and religious influences
- Lifestyle
- Nutritional knowledge
- Environmental issues: organic produce, energy saving, cruelty free, packaging to reduce pollution
- Foreign travel
- Geographical location, access to shops
- Health
- Peer pressure
- Personal taste
- Preparation and cooking equipment available
- Preparation and cooking skills priorities
- Time available for preparation, cooking and eating
- Range of retail outlets selling food
- Shift patterns and working hours
- Technological innovations: online shopping

Advertising, marketing and promotional techniques

- The media, especially television, has a major influence on food choice.
- Reports and interviews on various topics, especially health, make us choose food differently. Articles in newspapers and magazines may persuade us not to buy certain products; they may almost 'frighten' people because of exaggerated publicity.
- Advertising may persuade a person into buying a food product but if it fails to meet the consumer's expectations, then it is doubtful that a second purchase will follow.
- Studies suggest that taste, texture, appearance and social acceptability generally receive greater priority than the nutritional quality of a sample product. Advertising companies use research to assess how a product may be effective.

- The advertisers main aim is to influence 'brand choice', so it may be brand loyalty sought after by all companies, hence the individual's choice is again assumed.
- Target groups are identified when advertising. Adverts on television are shown at times when the target group will be watching televisions, so increasing sales.
- A variety of promotional techniques are chosen with the target group in mind, e.g. free toys are often given with children's food products.
- Advertising, particularly on the television, may influence consumers, particularly children, to eat too many high sugar and fat foods.
- Increased advertising of healthy food products by the media could lead to an improvement in diet.

Available income

- The amount of money available restricts both the quantity, quality and variety of food which can be purchased.
- More high fat and sugar foods may be chosen if income is limited.
- Fruit and vegetables may not be purchased due to fear of waste.
- Sometimes ready meals can cost less than the total cost of ingredients if each is purchased separately. This could apply to people living on their own, as it can be more expensive to cook from scratch for one person.
- Untried foods may not be chosen for fear of waste if money is limited.
- If two people work in a household, then the increased income could mean that their diet could be very healthy and varied if a selection of 'healthy' foods is chosen.
- Two wages could also mean that more money may be available to buy more ready meals and convenience foods and these could be higher in fat and sugar.

Climatic conditions

- Climate will also influence the type of foods that can be grown in the country.
- Technological developments in agriculture and the fact that many foods can be imported can mean that climate may have less influence on food choice.
- In cold weather there is a need for energy giving and filling foods that will provide warmth to the body. In hot climates refreshing foods such as salad and fruit are popular.
- Custom also determines that certain foods are eaten at particular times of year, e.g. in winter and not in summer, such as Christmas pudding.

Cultural and religious influences

Religious influences

Hinduism

- The cow is sacred to Hindus, as are its products, such as milk and ghee (clarified butter). Hindus also consider coconut sacred.
- The pig, i.e. pork, and shellfish are considered unclean and are, therefore, not eaten.

Islam

- Muslims do not eat pork. Other animals have to be ritually slaughtered by a process known as 'halal'.
- In the UK, this type of meat is more expensive, which would be a consideration when choosing food.

Judaism

- Jewish people only eat kosher meats. These are meats from cud-chewing or cloven-footed animals which are slaughtered in a ritual ceremony.
- Foods that are forbidden include pork, bacon, ham, shellfish, eels, eggs with blood spots and gelatine.
- Milk and meat should not be eaten together.

Cultural factors

- Food and drink are almost universally associated with hospitality. Different cultures tend to have celebrations at which foods and drinks may be offered and received according to the occasion. Some examples are:

- **The Feast of the Passover**

This is celebrated by Jewish people. Matzo (the special unleavened bread) is broken by the father and a piece is passed to everyone. Wine is drunk four times and each person reaches out and takes a small selection of green vegetables, usually parsley or lettuce, dips it in salt water and eats it.

- **Ramadan**

The Muslims celebrate Ramadan. During the month of Ramadan Muslims submit to fasting; as one might expect, the end of Ramadan is welcomed with joy and celebration. The day begins with an early meal. Sugared almonds and sweets are exchanged as gifts.

- In the Christian festivals of the UK, Christmas and Easter have set traditions regarding food, such as Christmas cake and hot-cross buns.
- Foods are also used to celebrate particular events in an individual's life, such as birth, coming of age and marriage.

Lifestyle

- More women are employed outwith the home and have less time for meal preparation. Quickly and easily prepared or reheated, e.g. convenience ready-meals, may be used a lot.
- An increase in family income when both adults work means that they can afford the higher cost of ready-made meals.
- More people live alone and want a choice of single-portion meals which are easy to prepare, as they may not have the time or inclination to cook from scratch.
- People want and enjoy more leisure time, so do not want to spend time preparing meals.
- 'Eating out' has increased and many restaurants have developed play areas for children which encourages families to eat out, often at a reasonable cost.
- People travel greater distances to work and so there is less time and energy for meal preparation.
- Snacking and grazing are common throughout the day as opposed to sitting down and having a full meal. Consumers want food that is easily consumed on the move, e.g. breakfast bars or ready-made sandwiches.
- More homes have microwaves for quick cooking of meals.
- More homes have freezers which can store food for long periods of time and cut down on shopping trips.
- People may not have the required food-preparation skills and so buy 'take-away' or cook-chill foods.
- The growth of take-away and fast-food outlets which produce a large selection of ready-to-eat foods have given consumers a greater choice of quick foods with no effort involved. Many of these outlets have a home-delivery service or a drive-through facility.

Nutritional knowledge

- Food choice will be influenced by knowledge of the nutritional content of foods and the effect on health.
- Nutritional labelling on food may not be easily understood by some consumers, and so may not assist them to make healthy choices.

- There is an increased interest and awareness in the health benefits of foods and of 'healthy eating'.
- There are now many low-fat options available because of the number of people who want to slim.
- Healthy-eating trends have led to the production of functional foods with cholesterol-lowering claims.
- Low-sugar foods are produced for people who are interested in reducing sugar intake.
- Low-salt foods are produced for people who want to reduce their intake of salt.

Environmental issues

- Environmental awareness is a concept which affects the decisions people make when purchasing food.
- Increased interest in environmental issues has led to more additive-free food being produced because consumers believe too many chemicals are being used in food production.
- Consumers are buying more natural, unprocessed food because of the fear of chemicals in food leading to carcinogens.
- The trend towards vegetarianism is growing because of the fear of animal-related diseases.

Organically produced foods

- Organic food is purchased because, during growth, only animal and vegetable waste materials are used instead of man-made chemicals and fertilizers. Consumers may have concerns that man made chemicals could have cancer causing properties.
(See also pages 16–18 of this pack.)

Energy saving

- Consumers who use a microwave oven will save the world's resources as well as saving themselves money.

Cruelty free

- Many consumers feel concern about how animals are bred and treated within the food chain.
- Examples where animal care is considered are free-range chickens and eggs, and also 'dolphin-friendly' tuna – where the design of the net and the method of catching the tuna will cause no harm to the dolphins.

Packaging to reduce pollution

- Manufacturers are being encouraged to face up to their responsibilities in protecting the environment by cutting down on the amount of packaging used and trying to produce:
 - goods packaged in biodegradable materials (i.e. the packaging will rot away)
 - goods packaged in paper which has been recycled
 - refillable containers
 - environmentally friendly products.

Foreign travel

- More people travel abroad, where they have developed different tastes. Later, they want to eat similar foods at home.
- The food industry now produces a range of ready meals with a combination of ethnic ingredients.
- There are now many ethnic groups in the UK who have greatly influenced our choice of foods and who provide a relatively cheap and popular take-away service.
- Television cookery programmes with celebrity chefs have given consumers a taste for more exotic foods.
- Consumption of rice and pasta dishes has increased, partly as a result of increased foreign travel.

Geographical location/access to shops

- Geographical location affects the purchasing of foods. Choice of foods will either be vast (as in the city) or very limited (as in small villages or towns).
- Geographical location may also affect the range and frequency of delivery of fresh foods.
- Transport systems are now so well developed that it is possible for us in the UK to get fruits, vegetables and other foods flown in from all parts of the world.
- Markets, which provide a range of products at reasonable prices (because of low overheads), are often available to the small community. These are a good way to buy fresh fruit and vegetables. Farms may even offer 'pick-your-own' facilities, which will give the consumer very fresh, cheap produce.
- Some people are confined to their local area when shopping for food because they have no private transport – this can limit their choice of

foods, especially if they have to carry home heavy loads.

- The internet is fast becoming popular as a means of shopping by those people who have difficulty getting to the shops. Goods can be ordered through a website, which can then be delivered at extra cost to the customer.
- Corner shops are a useful part of the smaller community. They frequently keep hours which suit local lifestyles but there are higher costs and less choice of products.

Health

- Health factors which affect the choice of food can be linked to dietary related diseases and food allergies or intolerances.
- An unbalanced diet can result in a variety of dietary related diseases such as heart disease, obesity, diabetes, etc.
- The health of individuals at different stages of their lives will affect choice of foods. Convalescents, pregnant women and the elderly may all have special nutritional requirements which will affect food choice.
- Allergies to food may restrict food choice. Certain people are allergic to peanuts and may have an anaphylactic reaction. Manufacturers now print a warning on food product labels.
- Allergies to additives may also be common, particularly in children, and may encourage hyperactivity.
- Food intolerances to lactose will restrict the intake of milk and milk products. It is possible to buy lactose-reduced foods.
- Coeliac disease, where the lining of the intestine is damaged, is caused by a sensitivity to the protein, gluten. Gluten is found in wheat, barley, rye and oats so these foods cannot be eaten. As wheat protein is often added to many manufactured foods, it is important to check food labels. Many foods are labelled 'gluten free' and so more choice is made available to the consumer who suffers from coeliac disease.

Peer pressure

- The need for social acceptance and the imitation of one's peer group influences food choice, particularly during adolescence. Adolescents like to fit in with their friends.
- Adolescence is a time when changes in attitudes to food is likely to happen. As children get older, they generally have access to a wider range of foods. Individual likes and dislikes emerge. Peer group approval is very important at this stage.

- Influences from peer groups may affect a person's choice of diet. They may be unconsciously pressured into trying special diets, food fads or develop the same likes and dislikes as those of another person.
- These decisions are made so that the individual feels part of a group.

Personal taste

- If food looks attractive, smells appetising and tastes good then consumers are more likely to want these foods.
- The food industry produces a huge choice of food products to suit a wide variety of tastes, so individuals and families have more variety in their diet.
- Individual likes and dislikes within families can also be accommodated as many products are available in single portions – this is useful if one family member is a vegetarian.
- The food that people choose to eat depends not only on taste preferences but on individual moral and ethical considerations. For example, vegetarians or vegans may object to the killing of animals and may not like the taste or texture of animal flesh.
- Despite the huge range of ready meals available, many consumers find that the flavour and texture of these become very repetitive and boring. Some ready meals do not taste quite as good as the similar home cooked variety, depending on the skill of the cook.

Preparation and cooking equipment available

- There is a huge variety of food preparation equipment available to make food preparation easier and less time consuming for consumers with busy lifestyles.
- Advances in technology have meant that food processors, mixers, blenders, and juicers have led to quicker and easier food preparation, which could encourage consumers to use more fresh food produce.
- There are many types of cooking equipment which can help speed up the cooking process, or save time and money when deciding on choice of food products.
- The ownership of microwave ovens has increased and encouraged the use of ready-prepared frozen and chilled meals. Single-portion meals are specifically intended for use in the microwave.
- Freezer ownership has resulted in consumers being able to take ready-prepared meals straight from the freezer and microwave them in a matter of minutes.

- Many new cooking appliances do the monitoring and timing of the cooking process, e.g. bread makers, ice-cream makers. This may encourage consumers to try these at home and produce a more 'home-made' product.

Preparation and cooking skills priorities

- Loss of practical skills or limited practical skills in food preparation may mean that more ready-meals and take-away meals are used as an alternative to cooking.
- Priorities with leisure or work commitments may mean that there is less time for home-prepared foods.
- Reliance on convenience foods may mean that traditional food preparation and cooking skills are lost.
- If the cook's skills are limited, a variety in the diet can still be achieved because of the increased range of food products, food preparation and cooking equipment available.
- Many manufacturers make exotic, luxury-type foods which the consumer may not have the skills or confidence to prepare themselves.

Time available for preparation/cooking/eating

- Ready-prepared meals require no effort and are especially useful for people who are tired or in a hurry.
- Many new appliances can be programmed and so can save time in food and meal preparation.
- Many foods can be cooked in one container, e.g. slow cookers or steamers and so will save time in cooking and cleaning up.
- As there is more expendable income, people do not mind spending it on food which is quick and easy to prepare.
- Different lifestyles mean fewer families have the time to sit down for a meal together and so opt for quick convenience meals and snacks which can be prepared when needed.
- As people are working longer hours, the demand for take-away food or eating-out has grown, saving time and effort in food preparation and cooking.
- Many people take very little time to eat meals while at work. There is now a large variety of convenience products, e.g. dried soups, pot noodles, prepared sandwiches and snacks which are handy to eat in the workplace.

- Fewer families sit down to eat a balanced meal together and prefer to snack or graze when they feel hungry. This habit can lead to having too much fat and sugar in the diet.
- People are now less willing to spend time on preparing food when working. They want to spend time on more leisure activities.

Range of retail outlets selling foods

- There is a wide choice of places from which to purchase food. These include local shops, markets, discount stores, supermarkets, superstores, manufacturers selling by post and home-delivery food services, e.g. pizzas.
- Local shops may be specialist outlets, e.g. butchers, and may also sell local produce such as fruit and vegetables. Higher prices may be charged which may restrict food choice.
- Markets are a good way to buy local produce and this may often be cheaper.
- Farmers markets, which appear in many Scottish towns, offer consumers a range of good-quality foods. These markets support Scotland's farmers and producers by selling beef, cheeses, fish, venison, organic foods, etc.
- Some farms offer 'pick your own' facilities which will give the consumer very fresh cheap produce, e.g. strawberries.
- Discount food stores stock fewer types of products than most supermarkets but at lower prices which means that consumers on a limited budget will still have a choice of foods.
- Supermarkets and superstores offer a range of foods and food products and often have 'special offers' available to the consumer so increasing food choice.
- Many supermarkets offer fresh bakery products, fishmonger, butcher, delicatessen facilities within the store.
- Longer opening hours and 24-hour opening in supermarkets means that consumers will always have access to a range of foods.
- Many supermarkets offer the availability of online shopping to consumers who own computers.

Shift patterns/working hours

- Longer opening hours in all sections of industry and services mean that people have less time and inclination to prepare food, so there is a big market for ready meals that are quick and easy to prepare.
- A variety of frozen or cook-chill meals are available which can be microwaved in a short space of time and provide variety in the diet
- As many people have long working hours, they may need to take single-portion ready meals with them to heat at work
- The increase in shift working has meant irregular eating patterns with people in a household eating at different times of the day. Workers can quickly heat ready meals when they come home.

Technological innovations

Shopping has changed drastically since the 1980s, partly due to changing and busier lifestyles. This shift has led to less time for shopping. One-stop shopping, perhaps only once a week, is the normal pattern for consumers.

Technological innovations include scanners used in the shop-and-go method. Loyalty cards, which allow a record of all our purchases to be kept on computer, affect our choice of where we shop.

Online shopping means that a wide range of goods can now be purchased over the internet so it is possible to access goods from all over the world regardless of where you live.

Benefits for the consumer:

- The consumer can easily 'window shop' – research/compare brands and prices.
- The consumer can easily shop at any time of the day or night and from the comfort of home.
- Goods are delivered straight to the door.
- Delivery times can be selected which are convenient to the shopper.
- There are no crowds or queues to contend with.
- It can be cheaper as there are sometimes special internet discounts available.
- Many consumers now use this facility to do food shopping which saves time during a busy week.
- It is a very useful method of shopping for people who are housebound or disabled.

However, some consumers are reluctant to purchase food on the internet because:

- In some instances delivery charges substantially increase the cost of the goods.
- They dislike being unable to actually see/touch the goods with the computer screen perhaps not showing the quality and size exactly.
- The hassle involved in returning goods if unsuitable can be off-putting, e.g. poor-quality vegetables, shelf-life too short.
- Some people may be hesitant to use credit/debit card as a form of payment on a website for fear of fraud, especially on unsecured websites.
- Some consumers like to speak to someone dealing with their order; they don't like the anonymity of the online shopping process.

SECTION 4**The impact of technological innovation on consumer choice of food****Elaboration**

- Chilling and cook-chill products
- Extrusion cooking
- Fat replacers
- Freezing
- Freeze drying
- Functional foods
- Hydroponics
- Modified atmosphere packaging (MAP)
- Myco-proteins
- Sugar substitutes
- Textured vegetable proteins (TVP)
- Ultra high temperature/ultra heat treated (UHT) products
- Vacuum packaging

Food is processed industrially for the following reasons:

- to make it edible and increase palatability
- to make it attractive
- to make it more digestible
- to make it last longer
- to make it quick and easy to prepare and cook.

Chilling and cook-chill products**Definition**

- Chilled foods are perishable foods, which, in order to remain safe to eat, are stored in refrigerated conditions at a temperature above 1°C and below 8°C. However, 4°C is the usual desired temperature.
- Chilled foods range from products that rely on refrigeration as a method of preservation for all or part of that product's life to products that, for marketing purposes only, are sold through refrigerated display counters.

- Chilled foods are refrigerated to retard or prevent deterioration and growth of micro-organisms.
- Cook-chill foods are cooked in the factory and then chilled very rapidly in a blast of cold air to below 3°C to remove the heat and to prevent the growth of bacteria.

Chilling

The label on the food will give a 'use-by' date. The instructions must be carefully obeyed, for three reasons:

- Foods stored correctly very near 3°C should not cause food poisoning. One type of bacteria, called listeria, can grow at this temperature. It only grows slowly, but if the food is refrigerated first in the factory, then in a lorry, then in a shop, then in the home, the storage time can be so long that there are enough bacteria to make people ill. The illness is rare, but it can be very serious.
- While the low temperature stops most dangerous bacteria from growing, the bacteria, moulds and yeast that make foods look, smell and taste bad can still grow although the growth will be very slow; thus food can go bad, even when it is chilled.
- Enzymes in food will also continue to act. Again the action will be slower than at room temperature. The enzymes will make the food decay.

Packaging

- Packaging is very important with chilled foods. Water must not be allowed to evaporate from the food, nor must drops of water condense on it.

Storage

- Foods must be carefully stored below 4°C in the fridge.
- 'Use-by' dates must be observed
- Raw foods must never touch, or drip onto, any other foods.

Reheating

- Chilled food should be gently but thoroughly reheated on the hob, in a conventional oven or microwave oven.
- The centre of the food should reach at least 82°C for at least 2 minutes.

Advantages to the consumer of chilling and cook-chill products

- High-quality ingredients are used with less use of additives and so the product is seen as being healthier by the consumer.
- Foods are generally of a high quality as foods used in this process can only be used in their best condition. Therefore the consumer is usually purchasing a high-quality product.
- The consumer has a wide range of food items to select from with this process, and so consumer choice is widened.
- Foods are usually easy to use, prepare and cook and so are suitable for many consumers who want to save time.
- Many are microwaveable and so suit the consumer who needs food quickly or who do not have many food-preparation skills.
- Some chilled products are microwaveable and, therefore, require less energy in cooking, which reduces fuel costs to the consumer.
- Some chilled products can be heated by the microwave in their original packaging which requires less equipment and can save on the washing up for consumers.
- Manufacturers have responded to the demand for 'healthier' food ranges and vegetarian options and so consumer choice is widened.
- Cook chill foods are produced in small portion sizes and are useful for single people as they can work out cheaper than buying individual ingredients to make the same dish.
- There is no loss of nutrients. Food is usually cooked first and then chilled to just above freezing – this is done very quickly and, therefore, there is less loss of nutrients for the consumer.
- Chilling does not affect food quality, colour, flavour, texture or nutritional value and, therefore, product is very acceptable to the consumer.
- Throughout production only the best-quality foods are used and strict hygiene conditions prevent food poisoning.
- Chilling is not as expensive a process as freezing since less energy is required; therefore it should be slightly cheaper for the consumer.

Disadvantages to the consumer of chilling and cook-chill products

- They require careful storage if food is not to be contaminated as this requires specialised storage equipment (refrigerator). Bacteria may breed and the consumer could suffer from food poisoning.
- Although chilled foods require only reheating, if this is not adequate or incorrectly done then bacteria are not destroyed and the consumer may suffer from food poisoning.
- Chilled foods have a shorter shelf-life than frozen products and are, therefore, not suitable for bulk purchase (unless frozen at home).

This means more frequent shopping trips for the consumer.

- Chilled products require a lot of packaging which may be unacceptable to consumers concerned about environmental issues.
- If using cook-chill for a number of people, then it is more expensive than cooking from raw ingredients.
- Some do not meet current dietary advice – they may be high in fat, sugar, salt and low in NSP.

Extrusion cooking

Definition

- In extrusion cooking, raw materials such as flour, starches, proteins, salt, sugar, liquid, steam and other minor ingredients are mixed, kneaded and worked into a semi-solid, plastic-like dough which can be used to produce a wide variety of products.
- This mixture is fed into a barrel and can be heated as high as 200°C for between 10 and 60 seconds. Extrusion cooking is therefore called a high-temperature, short-time (HTST) process. Pressure is created within the barrel and the food is forced (extruded) through specially designed die holes.
- Pasta products are produced by this method – the shape of the pasta is determined by the hole size and shape that the product is extruded through.
- Extrusion cooking is used to produce baked snacks made from potato, wheat, rice starch. After extrusion they are oven dried and flavoured, e.g. cheese puffs.
- Extrusion cooking is used to produce fried snacks made from potato, wheat, rice starch. After extrusion they are deep fried.

Extruded foods include

- a wide variety of snacks, including hollow and airy savoury snacks (crisps, cheese puffs) and pillow-shaped snacks that can be filled with fruit paste
- croutons
- breakfast cereals
- full-fat soya flour
- pre-cooked noodles and a wide variety of shaped pasta
- beverage, soup and gravy bases
- confections, e.g. boiled sweets, fruit gums and chocolate.

Main categories of product

Pasta

Pasta products are made from durum flour, water and eggs, all formed into a homogeneous dough. Traditional pasta products use low-temperature extrusion, less than 50°C. If the temperature of the dough exceeds 60°C, the cooking quality of the finished product will be damaged. The type of die holes will determine the finished shape of the pasta.

Textured vegetable protein

Two types of texturised meat-like products are made by the extrusion process:

- meat extenders, using defatted soya flour or parts of the soya bean mixed with a variety of additives – mixed with water, the resultant product can be used to extend minced meat or meat products and is used extensively in pizza toppings and meat sauces
- a product that resembles real meat in appearance and structure.

Snacks

Many advances have been made since the development of the first corn snack. Extruded snacks now come in many different shapes and in many different flavours. These snacks are made from potato, wheat, rice, flour or bran, along with starches or modified starches. Snacks made from these ingredients can be divided into two types: baked or fried. The baked type of snacks are extruded to produce highly expanded products. After extrusion the snacks are dried in an oven and coated with flavour and oil. With the fried type of snack, product expansion takes place during the deep-fat frying step instead of during extrusion. Extrusion, in this case, partially cooks and forms the product shape.

A recent development in extruded snacks involves dual or coextrusion of two different food materials to form a single snack using a specially designed die and possibly two extruders. This allows the development of many new snacks, for example dual-textured snack products.

Breakfast cereals

A variety of breakfast cereals can be produced by the HTST extrusion cooking process. The cereals to be used, for example maize, wheat, multi-grains, bran, etc., are moistened and extruded through the die holes and cut into the desired size. The extruded breakfast cereals may be either dried and tempered before flaking or shredding, or dried and tempered then puffed or expanded under pressure. The breakfast

cereals may then be sugar coated if wished and toasted in an oven to give the desired colour and crisp or crunchy texture.

The other method of breakfast cereal production is slightly different in that the cereal mix is expanded into a porous matrix during the HTST extrusion cooking process. The extruded breakfast cereals are then sugar coated, if wished, and toasted in the oven.

Advantages of extrusion cooking to the consumer

- It provides a greatly increased range of foodstuffs, often making use of previously unpalatable products. Some previously unpalatable protein crops, for example soya beans, can now be converted into nutritious and acceptable products. This adds variety in colour, texture and flavour to the diet.
- Extrusion cooking seems to make starch more digestible and, therefore, allows it to be broken down to glucose to enter the bloodstream more quickly. Some extrusion foods may have slightly higher levels of non-starch polysaccharides (NSP) which helps the digestive system remove waste from the body.
- Extrusion products can be processed with no added fat and are therefore healthier, e.g. textured vegetable protein (TVP) as a meat substitute.
- Extrusion cooking produces a wide range of products with variations in texture, colour and flavour. This versatility and the fact that a range of often cheaper raw materials can be used means that production costs can be cut.
- Foods produced by extrusion cooking will keep for a long time at room temperature. The length of time can be improved by storage in airtight containers or simply by resealing the bag or container. This means fewer shopping trips for the consumer who can also keep a supply of these foods for emergencies.

Disadvantages of extrusion cooking to the consumer

Some products which have been deep fried, e.g. snacks, have a high fat content which would encourage weight gain

Fat replacers

Saturated fats have been publicised as the type of fats which should be cut down on in the diet. However, hydrogenated fats or trans-fatty acids (as used in margarines) are just as harmful to health. Manufacturers have therefore turned their attention to developing products which directly

replace the fat source in meals with a lighter vegetable oil-based product.

Value of fat replacers to the consumer

1. Can contribute to replacing the fat source in meals with a healthier and lighter vegetable oil-based product.
2. Can help consumers meet the dietary target of ‘eat less fat’ and will extend consumer choice.
3. Fat replacers are low in energy value and can help contribute to a low-fat diet.
4. Fat replacers are free from cholesterol and will, therefore, reduce the risk of heart disease.
5. There are a wide range of fat replacers available that can be used in dairy products and some baked goods, e.g. N Lite, Dairy Low, and this gives the consumer a wide variety of products from which to choose.
6. Culinary uses are still limited because fat replacers have a restricted temperature range in cooked and baked products.

Some common fat replacers are:

Fat replacer	Elaboration
Whirl	<ul style="list-style-type: none"> • A blend of partially hydrogenated vegetable oils • Aims to be a substitute for butter/margarine in all cookery processes • Liquid and needs no refrigeration • Easy to blend • Can be used in vegetarian products
Simplese	<ul style="list-style-type: none"> • Made from milk proteins • Suitable for use in dairy products and oil based foods such as frozen desserts, whipped toppings, frostings, baked goods, soups, sauces, dips and spreads • The Tesco ‘Healthy Eating Lowest’ range contains simplese • Requires to be refrigerated as with other dairy products

(continued)

	<ul style="list-style-type: none"> • Makes products which are of a similar creaminess as standard products • Gives good results with regard to texture, flavour, emulsification, stability in products
Olestra	<ul style="list-style-type: none"> • A very heat-stable fat and can be used in frying and baking • It has no calorific value as it does not get absorbed and so could be useful in a weight-reduction diet • May cause anal leakage • May cause a decreased absorption of fat-soluble vitamins which could lead to the development of deficiency diseases
Oatrim	<ul style="list-style-type: none"> • Can be used to replace large amounts of fat • Is heat stable • Therefore, it could contribute greatly to the reduction of animal fat in the diet and reduce the risk of heart disease
Gelatin	<ul style="list-style-type: none"> • This is used as a gelling agent and is used in spreads to trap the water in a mesh-like construction, so preventing the emulsion breaking down. It also increases the viscosity of the emulsion to give a rich mouth feel on eating the spread
N Lite range	<ul style="list-style-type: none"> • This range is made up of four different fat replacers so giving more choice • Two are designed for liquid food, one for baked goods and one for dairy foods
Dairy-Lo	<ul style="list-style-type: none"> • This is a milk protein concentrate • Available in powder form and can be used in a variety of dairy products • Low in energy, free of cholesterol

Oils

Certain oils have recently been perceived as healthy, e.g. **olive oil** and walnut oil. This is **due to their high mono-unsaturated fat content**. These oils are used in Mediterranean countries.

As yet, technology has not produced a modified oil replacer as such for general or specific culinary purposes.

Freezing

Definition

- Freezing of fresh foods is carried out rapidly by manufacturers so that small ice crystals are formed. This gives better-quality food.
- Slow freezing is undesirable because slow growth of large ice crystals causes excessive drip when the foods are thawed.
- It is very important that freezing is carried out rapidly, especially in air-blast freezers where loss of moisture can occur. This can cause weight loss and quality loss in foods.

Advantages of freezing to the consumer

- Many frozen foods can be cooked straight from the freezer to oven or microwave, so being more convenient to the consumer. Developments in packaging for frozen foods have also allowed greater flexibility for the consumer.
- Increasing numbers of women working outside as well as in the home or in single-parent families have placed convenience in meal preparation near the top of their consumers' list of priorities.
- Many more people also now have freezers, so the product can be purchased and stored – this is a useful stand-by for consumers.
- Most people have microwaves and many products can be cooked straight from frozen – no defrosting needed so saving time for the consumer.
- Can contribute to healthy eating – convenient packs of calorie/fat counted ready meals.
- Frozen products are often less expensive to buy due to efficient mass production – e.g. often vegetables can be bought in bulk.
- Little or no loss of nutrients by the freezing process – which is healthier for the consumer. Food producers only use the best raw materials for freezing and therefore we know that nutrient levels are high before processing begins. These nutrient levels are then maintained throughout freezing. Fresh foods, however, lose nutrients while stored and also again if cooked for too long by the consumer.
- Many people wrongly believe that frozen food does not have the same nutrients as fresh foods. In fact frozen fruit and vegetables often have more nutrients as they are harvested while young.
- Many hospitals, schools, pubs and fast-food outlets also use frozen food – again saving time.

Disadvantages of freezing to the consumer

- Over-cooking of frozen vegetables can result in nutrient loss.
- As with other types of ready meals, some frozen meals can be high in fat, sugar and salt, and low in NSP. Additional vegetables may need to be served to increase the NSP content.

Freeze drying (accelerated freeze-drying, AFD)

Definition

- This is a modern system of drying frozen food under vacuum at reduced pressure.
- This method of drying causes little damage to the food since ice is driven off as water vapour and it is therefore useful for heat-sensitive foods.
- This process preserves the flavour and colour of the food and is used for soups, instant coffee granules and dried milk. These foods can be easily rehydrated by adding water.

Advantages of freeze drying to the consumer

- No discolouration of product – sometimes colour is improved offering a more appealing product.
- Sensitive nutrients remain unharmed or just a minimal loss.
- Any size of food can be freeze dried.
- Food can be stored for long periods in moisture-proof packs at normal temperatures – filling the container with nitrogen before sealing will allow storage for two years.
- Can be rapidly rehydrated (addition of liquid) and so is convenient.
- Product closely resembles the original – preserves the colour and flavour of foods.
- Little storage space needed in the cupboard – convenient.
- Flavour is retained through the process, and so taste is improved.

Functional foods

Definition

- Functional foods contain ingredients that have health-promoting properties over and above their nutritional value.
- They are foods marketed as having special health effects.
- Functional foods cover a wide variety of products, ranging from foods based on a particular functional ingredient (e.g. plant sterol enriched margarines) through to staple foods which are fortified with a nutrient which would not normally be present in the food (e.g. bread fortified with folic acid).

Functional foods first became popular in Japan in the mid-1980s where they were introduced to improve the health of the population. As consumers worldwide become more health conscious, the demand for health-promoting foods is expected to grow.

Main categories of functional foods

The term 'functional foods' can cover a range of products such as:

Spreading fats

Spreading fats are currently one of the biggest functional-foods sectors in the UK. Fats can contain plant sterol esters which can lower blood cholesterol levels, particularly LDL cholesterol, and so decrease the risk of heart disease as part of a healthy diet. This substance is derived from plant stanols found naturally in small amounts in food like wheat, rye and corn. The way that the plant stanol works is by blocking the absorption of cholesterol from the gut into the blood. Therefore, there is less cholesterol circulating in the blood. Some spreads provide omega-3 fatty acids from fish oils which, if in sufficient quantities, will contribute to the prevention of heart disease.

Dairy foods

Another large functional food area is that of dairy foods such as yoghurt and fermented milk products containing 'friendly' bacteria.

- *Probiotics* are foods with beneficial live cultures as a result of fermentation, or that have been added to improve the balance of microbes in the intestine. Products containing probiotic bacteria claim to promote good intestinal health and act as an aid to digestion.

- *Prebiotics* are mainly carbohydrates, in particular starch and NSP, which escape digestion in the upper part of the intestine. Prebiotics ferment in the large intestine and stimulate the growth or activity of probiotic bacteria in the bowel. This encourages a healthy bowel and evidence suggests that people with constipation may find prebiotics have a similar effect to eating a lot of NSP foods.
- Omega-3 fatty acid enriched eggs are also available.

Cereals and grains

This is an area where mineral and vitamin fortification is used, in particular, breakfast cereals, cereal bars and bread.

A bread has been produced which uses soya flour and linseed which contain a substance with the same qualities as the hormone oestrogen in the body. This hormone is low at the time women go through the menopause. This type of bread is thought to enhance the levels of oestrogen in women going through the menopause and so give some protection against breast cancer.

Drinks

Drinks are a fast developing area of functional foods. Some are fortified with the anti-oxidant vitamins A, C and E and some with herbal extracts. Some drinks contain caffeine, which is said to improve physical endurance.

Claims about the health benefits of functional foods must be based on sound scientific evidence. Food manufacturers are not allowed to make a claim that they can prevent, treat or cure disease. A statement such as 'provides calcium which is important for strong bones and teeth' is promoting a health claim that is acceptable. However a claim that states 'provides calcium which helps prevent osteoporosis' is a medical claim that is illegal.

Advantages of functional foods to the consumer

- Functional foods have the potential to improve health and reduce the risks of certain diseases when taken as part of a balanced diet and healthy lifestyle.
- Allows consumers to take greater control of their health through food choices, knowing that some foods will provide specific health benefits
- Some foods, e.g. breakfast cereals, will provide a reasonably inexpensive source of additional minerals and vitamins in the diet.

- Convenient for today's lifestyle in that they could bring about health benefits quicker than would normally be the case through eating conventionally healthy foods alone.

Disadvantages of functional foods to the consumer

- Consumers may come to over-rely on functional foods for added health benefits instead of learning about and consuming foods that could provide the same benefits.
- Generally, functional foods would have to be eaten in a fairly large quantity and on a long-term basis to effect any improvement on health.
- In many cases, functional foods are more expensive, and it is possible to get the same beneficial ingredient more cheaply and naturally from a balanced diet.

Hydroponics

Definition

- Hydroponics involves growing plants in a substance other than soil.
- It uses a compound of nutrients for plants in a solution of water (i.e. a nutrient solution).

The nutrient solutions contain the same chemical elements as fertile soil but other requirements for successful growth of plants, e.g. natural light and temperature, must also be carefully monitored and the supply of nutrients may need to be altered if fluctuations in light or temperature occur.

Two main methods are used commercially: hydroponics – water culture; and hydroponics – sand/gravel culture.

Hydroponics – water culture

This entails growing plants in water rather than soil. Plants are grown in water in troughs that have all the required nutrients added – a nutrient solution is circulated continually through the troughs in which the roots grow. The composition of minerals and oxygen can therefore be carefully monitored and maintained at the correct level.

Soil is not needed because the plant's weight is supported by stakes and wires.

Hydroponics – sand/gravel culture

Plants are grown in sand/gravel contained in pots or containers which have the nutrient solution added.

Advantages of hydroponics to the consumer

- Enables food to be grown in areas where soil conditions are poor and so will enable consumers to have access to foods that might not otherwise be available.
- Cuts out the problem of soil-borne disease.
- Other disease-control chemicals can be added to the solution, so it provides plant food which can be of good quality/disease resistant.
- May be useful in areas of the third world where soil and water conditions are poor but climate is good, and so could help the developing world's food shortage.
- Using these methods, growers can expect much higher yields.

Disadvantages of hydroponics to the consumer

- Very few products in the UK are derived from hydroponics and so the method has a limited impact in terms of consumer choice.
- The equipment required for commercial hydroponics is expensive and requirements are extensive; therefore, it may only be viable for large-scale growers of vegetables.
- Due to the expense of the process, resultant costs would have to be passed onto the consumer, resulting in higher costs – unless done on a huge scale.

Modified atmosphere packaging (MAP)

Definition

- The process involved in modified atmosphere packaging (MAP) is when the normal composition of air is changed or modified within the package. Oxygen is reduced and CO₂ and nitrogen are increased.
- The normal composition of air is 20 per cent oxygen, 79 per cent nitrogen and 1 per cent carbon dioxide. A modified atmosphere is one in which the normal composition of air is changed or modified within a package.
- This means that the oxygen content of the air in the package headspace is reduced and the level of nitrogen and carbon dioxide is increased. Thus the shelf-life of food products is increased without the use of preservatives, freezing or drying.

- Bacterial growth and enzyme spoilage is retarded (slowed down) by the oxygen being removed.
- Food is enclosed in packaging film which is water resistant and is a high gas barrier material. This improves storage of food and prevents food drying out.

The shelf-life of many perishable foods, e.g. meat, fish, poultry, fruit, vegetables, eggs and baked products, is limited in a normal atmosphere due to three factors:

- the chemical effect of the oxygen in the atmosphere
- the growth of aerobic food spoilage micro-organisms
- possible attack by insects or pests.

These three factors, working separately or together, result in changes in colour, flavour and smell, and a deterioration in the overall quality of foods.

Examples of MAP foods

- muscle foods – beef, pork, offal, poultry, fish, e.g. white, oily, salmon, scampi, shrimps.
- fruit and vegetables – apples, broccoli, celery, lettuce, tomatoes, mixed salads, etc.
- baked products – bread, cakes, crumpets, fruit pies, pitta bread, etc.
- other products – ready meals, e.g. quiche, sausage rolls, pizza and pastas, potato crisps, nuts, etc.

Advantages of MAP to the consumer

- Extended product shelf-life of fresh foods without the use of preservatives or additives. Most consumers like the idea of foods being preserved by natural gases rather than by the use of preservatives and additives. The gases used are nitrogen, oxygen and carbon dioxide – the proportion of the gases used depends on the type of food being packaged.
- The oxygen content of the package is reduced, therefore reducing the growth of micro-organisms that require oxygen for multiplication.
- Enzyme activity is delayed because the normal atmosphere has been removed and, therefore, the product will keep a better appearance.
- The changes in consumers' lifestyles, e.g. less time for shopping and meal preparation, and food preferences have resulted in consumers requiring shelf-stable, convenience foods that require a minimum of preparation. Food manufacturers have had to meet these demands by

providing a variety of foods which are of good quality, easy to prepare, preservative free and packaged under a modified atmosphere.

- Increased variety in the types of foods available all year round for the consumer.
- Improved product presentation and customer appeal, as foods are packed in easy to store/carry forms. Food is enclosed in packaging which allows the product to be seen before purchase.
- The product looks attractive as the colour does not deteriorate (until the packet is opened) – this encourages purchase.
- The packaging is water resistant – this improves storage of foods as it prevents food drying out.
- MAP uses less energy than freezing or drying – it is more economical as it is an energy-saving process (good for manufacturers).
- It is cheaper in the long run to produce – this is an advantage for manufacturers who should then pass on any cost savings to consumers.
- It is only available for use with products which are of good quality when packed and so it is limited to certain product types of fruit, veg, meat, fish. But consumers know they are buying quality food.

Disadvantages of MAP to the consumer

- MAP can only extend the shelf-life of good-quality food. Food in peak condition must be used so increasing cost to the manufacturer and eventually the consumer.
- There is a danger that consumers may not follow the correct storage instructions required for MAP products which could lead to food spoilage/consumer illness. While MAP slows the deterioration of a product, it never totally stops it and should not be regarded as a substitute for a proper storage temperature.
- The initial cost of setting up the MAP system and packaging is high for the manufacturer.
- The initial cost of setting up the MAP system and packaging equipment, etc. is passed onto the consumer and so the consumer may have to pay a higher price for the products.
- The increased amount of packaging may be an environmental concern for consumers.

Mycoproteins

Quorn is an industrial food material developed to fulfil dietary modifications. It is used to replace meat and is low in fat.

Definition

- Quorn is made from a tiny fungus (like a mushroom), which grows as fine filaments or fibres and occurs naturally in the soil.
- The quorn fungus is grown in a glucose mix and grows very quickly, doubling its weight every six hours. After a few days it is heat treated and harvested in sheets.
- Vegetable-based flavourings and sometimes colourings are added to it before it is sliced, dried and cut into chunks or minced.

Products from quorn

Quorn can be found in ready-made meals such as curries, casseroles, sweet and sour dishes, potato-topped pies, crispbakes, escalopes, pastry pies and can also be bought as a raw ingredient for cooking.

Quorn needs to be used within two days of purchase or it can be frozen.

Nutritional value

Quorn is a high-protein food, containing less protein on a weight for weight basis than meat or fish, but comparable to egg and cottage cheese.

Mycoprotein is considered a good-value supplement to cereal-based diets as it contains amino acids, which may be low or lacking in such diets.

Mycoprotein provides minerals and most B vitamins but it does not provide vitamin B₁₂ for which animal products are the major source. Mycoprotein is rich in zinc and represents a useful source for vegetarians who generally have low zinc intakes. The level of iron is equivalent to that of lean roast pork. Quorn also has a useful dietary fibre (NSP) content and can be made into a variety of vegetarian dishes.

Advantages of quorn to the consumer

- Useful as a replacement for meat as it is a good protein provider and so would add variety to the vegetarian diet.
- Is low in fat and so is ideal for those who are looking for a low-fat alternative to meat and some variety in a low-fat diet. It has no animal or saturated fats, and this helps prevent CHD.
- A good provider of zinc and vitamin B and so useful in vegetarian diets.
- Convenient to use – no preparation and only needs reheating so quick to cook – good for busy lifestyles.
- Has a very limited shelf-life – similar to meat – and so has to be used quickly, but can be frozen.
- The texture is not altered by freezing or cooking and does not shrink on cooking – therefore, there is no waste and so is economical.
- Nutritional value does not change with cooking or freezing.
- Can be easily incorporated into a variety of dishes as it readily absorbs flavours and so has many uses.
- Low in calories – therefore, ideal for reducing weight.
- Manufacturers have used quorn in a wide variety of products – both ready-made and semi-made, so increasing the variety in the diet.
- Is now readily available for purchase in many supermarkets and so easy to buy.
- Good source of NSP (dietary fibre) – so even small portions are filling.
- No wastage in food preparation and no loss during cooking – value for money.

Disadvantages of quorn to the consumer

- Does not contain vitamin B₁₂, which is required for vegetarians who may use this product, so they would have to gain their vitamin B₁₂ intake elsewhere.
- Some quorn products contain egg/egg white and so are not suitable for vegans.

Sugar substitutes (sweeteners)

The main types of sugar substitutes are

- **Intense sweeteners** – weight for weight far sweeter than standard sugar.
- **Bulk sweeteners** – weight for weight have similar level of sweetness to standard sugar but may have a lower energy level.

Intense sweeteners

Name	Uses
Saccharin (made from petroleum)	300 times sweeter than sugar, used in canned foods, salad creams, sweets, soft drinks
Aspartame (made from amino acids)	About 180 times sweeter than sugar, used in soft drinks, yoghurt, ice cream, hot drink mixes, Canderel and Nutrasweet
Acesulfame (made with sulphur and nitrogen)	About 200 times sweeter than sugar, used in soft drinks, jams, jellies, yoghurts, sweets
Thuamatin (made from an African plant)	About 2000 times sweeter than sugar, used in chewing gum
Alitame	About 2000 times sweeter than sugar so only small amounts needed. No after-taste and is stable in food-processing procedures. Used in the 'lite' food market and confectionery

Bulk sweeteners

Name	Uses
Erythritol	<p>Naturally occurring substance. Found in melons, grapes, pears, seaweed and mushrooms. Can be produced by biotechnology – wheat or maize starch provides the base ingredient, which is then converted to glucose by hydrolysis. This is then fermented by a special yeast, producing the sweetener which is then crystallised. Suitable for diabetics. Does not have any cancer-inducing properties.</p> <p>Uses</p> <ol style="list-style-type: none"> 1. Blended with intense sweeteners to give products a more natural sweet taste rather than intense sweeteners used on their own. 2. Low solubility and ease of crystallisation means that it is suitable for use in foods that require the sugar to be in crystalline form, e.g. chocolate. 3. Low energy content means that it is suitable for inclusion in a number of 'health foods' and weight-watcher products, instead of intense sweeteners.
Hydrogenated glucose syrup Isomalt Mannitol Xylitol	All of these are mainly hydrogenated sugars and are mainly used in sugar-free confectionery
Sorbitol	Sorbitol is used in jams for diabetics as it does not require insulin to be metabolised
Lactitol	Lactitol is made from the milk sugar called lactose. It is also suitable for diabetics and is used in reduced-sugar jams, jellies and marmalade

Advantages of sweeteners for the consumer

- The development of sugar substitutes can reduce the sugar content of the diet and can assist weight reduction and help meet the dietary target for sugar consumption.
- Sugar substitutes have little or no energy value and can therefore aid weight reduction as they have a lower energy value.
- Sugar substitutes especially intense sweeteners can be used in the 'lite' market for foods and can therefore help reduce the energy value of these products, assisting in weight reduction.
- Can be used in confectionery, bakery goods and many other foods, increasing the range of 'healthy options' available and giving the consumer a wider choice of products.
- Bulk sweeteners are used in sugar-free confectionery and can help reduce the risk of tooth decay and obesity.
- Sorbitol, lactitol and erythritol do not require insulin to be metabolised and are, therefore, used in products suitable for diabetics, e.g. jam/jellies, and so they increase the consumer's food choice.

Disadvantages of sweeteners for the consumer

- Intense sweeteners, e.g. saccharin, sometimes have an unpleasant after-taste which is off-putting for the consumer.
- Artificial sweeteners do not have the same functional properties as sugar, and are therefore less suitable for food preparation, as recipes would have to be adapted.
- Some countries have banned sweeteners, as research suggests that they have an adverse effect on health.

Textured vegetable proteins (TVP)

Definition

- Textured vegetable protein or TVP is made from soya-bean flour that has had its oil removed. The soya flour is mixed to a dough with water and then extruded in a process that cooks the dough and gives TVP its fibrous meat-like texture. It needs to be rehydrated (mixed with water) before use.

Uses of TVP

1. Used as a meat substitute in certain dishes, e.g. spaghetti bolognese.

2. Used to extend food, i.e. half TVP and half meat.
3. Used to lower the fat content of a dish.
4. Used to add variety to a vegetarian diet.

Advantages of TVP to the consumer

- TVP is a high biological value protein and is, therefore, a very good source of protein.
- It contains some NSP (dietary fibre) and is low in calories.
- TVP contains less fat than red meat and no cholesterol and saturated fat.
- Most TVP made in the UK is fortified with amounts of iron, thiamine, riboflavin and vitamin B₁₂ to bring the nutritive value close to that of meat – a good source of protein for vegetarians.
- Easy to store for several months as it is dried – needs no special storage conditions.
- Handy to store in a cupboard for emergencies.
- Less expensive than meat – can be mixed with meat, e.g. minced meat to keep the cost down.
- Once rehydrated (mixed with water) it can be frozen.

Disadvantages of TVP to the consumer

- Can be lacking in flavour unless chilli or curry powder is added.
- Has a different texture to meat which some people may not like.

Foods containing TVP

TVP is available plain or with a savoury meat flavour. It comes in dried granules or in chunks and also as burger mixes or mince. Pre-prepared TVP foods are available.

Ultra-high temperature (UHT)

Definition

- UHT is a sterilising process in which foods are rapidly heated to about 140°C and held at that temperature for a few seconds to kill any bacteria present.
- The product is then rapidly cooled and packed in pre-sterilised containers. An airtight seal prevents recontamination until the container is opened.
- Examples are long-life milk and fruit juices. These should keep for at

least three months at room temperature. Canned food which is UHT treated can be kept for 2 to 3 years. One example of a UHT product which is very beneficial to the consumer is the small plastic individual milk cartons found in hotel rooms and on airlines.

Advantages of UHT to the consumer

- Increased shelf-life of products allowing long-term storage for consumer – reduced shopping trips.
- Storage easier as products do not have to be stored in refrigerator (e.g. milk, drinks for packed lunches) and so more convenient (unless opened) – no specialised storage equipment required for these items.
- Consumer fear of food spoilage, food contamination, illness is reduced as the processes involved in UHT kill bacteria – safer food.
- Generally UHT items – particularly milk – may be cheaper than the fresh alternatives and so good for low-income groups.
- Can be bought in bulk and is also a handy type of food in remote areas of the country – useful for emergencies in bad weather.

Disadvantages of UHT to the consumer

- A limited variety of foods can be treated by this process, and so the range available is limited.
- High temperatures achieved in the process lead to changes in the natural flavours of the items which may not be agreeable to consumers.
- Must be stored correctly, as with fresh food after opening, otherwise a food poisoning risk.
- Vitamin losses are similar to those losses during pasteurisation, e.g. of milk.

Vacuum packaging

- An impermeable plastic film is used and air is removed under a vacuum from the pack.
- When the air is removed, food is kept in anaerobic conditions with no oxygen and so food spoilage is very slow.
- Used for foods such as bacon, fish, cheese.

Advantages of vacuum packaging to the consumer

- Food is thoroughly sealed and packaging clings to food, so there is no air present – slowing down of food spoilage results.

- Packaging will withstand cold temperatures (fridge/freezer) without breaking up.
- Packaging reduces the amount of space required for storage, as the packaging clings to food, e.g. ground coffee.

Disadvantages of vacuum packaging to the consumer

- Once the seal has been broken, the contents have to be stored appropriately to avoid contamination and food spoilage.
- Often the food will dry out if not re-covered with additional packaging, e.g. cling film.

SECTION 5

Current statutory food labelling requirements

Elaboration

Relating to:

- information on food labels

Please check the Food Standards Agency website on a regular basis for updates (www.food.gov.uk).

Food labelling requirements are laid down under the Food Safety Act 1990. Information on food labels assist consumers in the following ways:

- By giving information about the food products so that they know what they are buying
- By allowing consumers to make informed dietary choices
- By giving information on how to use and store foods.
- By allowing consumers to choose between different foods, brands and flavours

The food label must show the following statutory (compulsory) information.

Information	How this would help the consumer make choices
The name of the food or a description of what the product is	<ul style="list-style-type: none"> • Consumers know exactly what the food is. • Can take account of likes and dislikes. Note – If the food has been processed in some way the process must be named.
A list of ingredients in descending order (the first on the list is the largest ingredient)	<ul style="list-style-type: none"> • Can take account of likes/dislikes, allergic reactions, vegetarian foods.
The shelf-life: 'Use by' or 'Best before' are required by law	<ul style="list-style-type: none"> • Lets consumer know when the food should be eaten by and whether or not food is safe to eat.

(continued)

	<p>‘Use by’: This is used on highly perishable foods, e.g. yoghurt, chicken. These foods will become a food-poisoning risk if eaten after the stated date. Food must be used by the date or be thrown away. Foods may be cooked and frozen before the ‘Use by’ date.</p> <p>‘Best before’: This is used on foods like pasta, flour, biscuits, tinned and dried foods. These have a longer shelf-life and are not likely to have ‘gone off’ when they reach their deadline. By then they will not be ‘at their best’, e.g. biscuits may have gone a bit soft but these foods will not cause food poisoning. Food will still be edible after the date, although appearance and quality may have deteriorated. The ‘Best before’ date is the date up to which the manufacturers expect food to remain at peak quality if stored correctly.</p>
Food additives	<ul style="list-style-type: none"> • Some consumers are allergic to certain additives and need to know if they are present in a food.
Name and address of manufacturer, packer or EU seller	<ul style="list-style-type: none"> • May be needed in case of complaint. • May have a good reputation re quality – which could encourage consumers to buy.
Weight or volume of product	<ul style="list-style-type: none"> • Helps the consumer to work out value for money and compare products. <p>A lot of pre-packed goods carry the ‘e’ mark. This means that the average quantity must be accurate but the weight of each pack may vary slightly.</p>
Place of origin/where it comes from	<ul style="list-style-type: none"> • Some consumers may avoid products from certain countries on moral grounds.
Storage instructions	<ul style="list-style-type: none"> • If followed correctly, the consumer is assured that food is safe to eat.
	<i>(continued)</i>

**Instructions for use/
cooking**

- Helps to ensure that foods are correctly prepared.
- Lets the consumer know whether he/she has the time/ability/equipment to prepare food.

GM ingredients

In April 2004 new rules for GM ingredients came into force within the EU. The presence of genetically modified organisms (GMOs) or ingredients from GMOs must be indicated on the label. Foods produced with GM technology (e.g. cheese produced with GM enzymes and products such as milk, meat and eggs from livestock fed on GM animal feed) will not have to be labelled.

EU labelling

An EU Directive in 2003, which came into force in 2004, has clarified some aspects of food labelling and ingredients. Food manufacturers are required to list 12 potentially allergic ingredients. The allergens include cereals containing gluten, fish, crustaceans (including crab and shrimp), peanuts, soy, milk and dairy products, nuts, celery, mustard, sesame seed and sulphites. The list of allergenic food ingredients will be updated as required on the basis of recent scientific knowledge. A one-year transitional period was allowed for manufacturers to adapt their packaging and labelling to the new rules.

The aims of this Directive are:

- to give a high level of health protection to consumers – many consumers suffer allergy conditions ranging from very mild to potentially fatal.
- to ensure that all consumers are appropriately informed as regards foodstuffs through the listing of all ingredients.
- to provide consumers who have allergies or intolerances with more comprehensive information on the composition of foodstuffs.

Quantitative ingredient declaration (QUID)

If an ingredient in the description of the product is featured on the packaging, e.g. Ham and Asparagus Quiche, then the quantity of the ingredient must be declared as a percentage. This is required as part of the EU labelling law.

The Food Standards Agency has carried out research which indicates that people would like simpler labelling to help them make informed and healthier food choices. A system of front-of-pack labelling of foods which provides 'at a glance' information about the nutritional content of food is being tested with consumers. Full details of this development can be obtained from www.food.gov.uk – the website of the Food Standards Agency.

Current voluntary food labelling requirements

Elaboration

- Nutritional information
- Bar codes
- Customer-care information
- Environmental information

Nutritional information

Many food labels show nutritional information which helps consumers make healthier choices in food products.

However, food companies do not have to provide nutritional information, but if they are making a claim such as 'low sugar' or 'low fat' they need to provide nutritional information to support that claim.

Nutritional information on food products

Many manufacturers label their products with nutrient content. These usually give the proportion of protein, fat, carbohydrate, vitamins and mineral element and the energy values. Check before you buy whether the quantities are per portion or per packet. For example:

Low-fat Yoghurt	per 100g
• Energy	428kj/102kcal
• Protein	4.8g
• Carbohydrate	17.9g
of which starches	12.3g
of which sugars	5.6g
• Fat	1.5g
of which saturates	0.9g
of which polyunsaturates	0.6g

Many food labels do more than just say that the food contains protein, fat, carbohydrate, vitamins or minerals. They will give a breakdown of the different types of carbohydrate, fat, the different vitamins and minerals, together with information about sodium (salt) and fibre.

Types of carbohydrate

Many labels may state the percentage of sugar or percentage of starch. When choosing goods, comparing labels can help reduce the intake of sugar without cutting down on the other nutrients. This is particularly helpful to diabetics or someone wishing to avoid tooth decay or weight gain.

Types of fats

Many labels state the percentage of saturates (generally thought to cause heart disease), unsaturates and polyunsaturates. Again, like sugar, the amount of saturated fat (dairy products, meats and some margarines) in the diet can be reduced by carefully looking at the label before making a choice. However, it is best to reduce all fats in the diet.

Vitamins and minerals

Labels may include a full list of vitamins and minerals, for example Vitamins A, B, C and D. B is sometimes broken down into thiamin, riboflavin and nicotinic acid and minerals into calcium, phosphorus, iron and iodine.

Sodium

This may be written as sodium or, more commonly, salt. In order to reduce salt in the diet, it is important to know the percentage of salt in the food we eat. This information is important to people on low-salt diets, such as people with kidney disease or high blood pressure.

Dietary fibre (NSP)

Current dietary advice suggests an increase in fibre intake to prevent constipation and other diseases linked to the bowel. A high-fibre diet may help reduce blood cholesterol, which in turn may prevent heart disease. Prepacked foods containing any fibre will have the percentage or weight written on the label.

Bar codes

A bar code is a label printed on packages which identifies goods in a form which can be read electronically and transmitted to a computer. Computerised checkouts read bar codes electronically and the scanner transmits the product number to an in-store computer. This relays the product's description and current price back to the checkout, where the information is displayed on a screen. The information is provided at the same time as the till receipt.

The in-store computer then deducts the item from the stock list so that the store knows the quantities of goods needing to be reordered.

Bar codes are useful to the consumer because they:

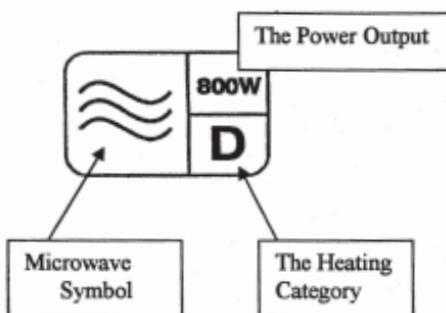
- speed up payments at point of sale as the product can be electronically scanned;
- allow less chance of the consumer being wrongly charged at point of sale;
- allow for better stock control in the retail outlet, ensuring adequate choice and range of goods available in store;
- give the consumer the opportunity in some retail outlets to self-scan products, speeding up the shopping process.



Customer care information

Microwave labelling scheme

Since 1992 most microwave ovens and food packs have displayed special labels. Microwave ovens vary in their ability to reheat food, so a system was needed to make sure that people using different ovens could get the same result when they cooked food and ensure that it was heated thoroughly to reduce the risk of food poisoning.



The **microwave symbol** shows that the oven has been labelled in compliance with the scheme.

The figure in the **power output** box shows the power output of the oven in watts based on an internationally agreed standard. The higher the number the faster the food will be heated therefore the shorter the cooking time.

The **heating category** box shows a letter. This is the heating category based on the oven's ability to heat small food packs.

Vegetarian labels

At present, there is no single legal definition of the terms ‘vegetarian’ or ‘vegan’ either at European or UK level, and the ‘Suitable for Vegetarians’ logo is voluntary and is not regulated.

However, such voluntary claims are subject to the general controls in the EU food labelling Directive, which are reflected in the UK’s Food Safety Act 1990. These prohibit any labelling that is false or likely to mislead the purchaser, particularly as to the characteristics of a food or drink, including its nature, identity, properties and composition.

Products carrying the ‘**Vegetarian Society Approved**’ logo must fulfil certain requirements laid down by the Vegetarian Society.



The Vegetarian Society’s food labelling scheme, known as the **Seedling Symbol**, was established in 1969. Since then it has become the most widely recognised and trusted stamp of vegetarian approval anywhere in the world.



The seedling symbol shows the following criteria have been met:

- Products have to be free of animal flesh, meat or bone stock, animal carcass fats, gelatine, aspic or any other products resulting from slaughter
- Products and ingredients should not have been tested on animals.
- Eggs used must be free range
- Products must be GM free
- Products must also be free from cross-contamination with non-vegetarian products/ingredients in the production process.

Many supermarkets have their own logo stating that foods are suitable for vegetarians. However, since many of these products contain egg or milk, they will not be suitable for vegans.

Organic food labels

Examples of labels indicating the product has been organically produced:

	<p>This label indicates that the product has been produced organically and has met the Soil Association Organic Standard. The Soil Association logo is found on about 70 per cent of organic food produced in the UK.</p>
	<p>The symbol indicates that the producer/ manufacturer is a member of the Organic Farmers and Growers and that the product has met their standards.</p>

The term ‘organic’ or ‘organically grown’ when applied to meat and dairy products or fruit and vegetables means that the products have been produced without the aid of artificial chemicals like pesticides or hormones.

Looking for these labels on food products might influence a consumer’s choice because it informs the consumer that:

- The product has been produced naturally.
- It has been grown without the aid of artificial fertilisers and pesticide sprays, and this may be important to consumers who have allergies.
- Its production causes limited damage to the environment: it avoids causing pollution, maintains valuable existing landscape features and habitats for production of wildlife and, in particular, for endangered species.
- In using organically grown produce the consumer is confident that no man-made chemicals that are carcinogens have been used.

Star ratings for refrigerators/freezers

Star ratings for refrigerators with frozen-food compartments and freezers advise the consumer about the care of food. They provide information which indicates how long the food is likely to be kept at its best if stored at below a set temperature.

They are found on refrigerators, freezers and foods which are frozen or can be frozen.

*	One week (-6°C) (store one week)
**	One month (-12°C) (store one month)
***	Follow best before (-18°C or colder)
* ***	Follow best before -18°C or colder. Can freeze fresh foods

Many supermarkets have their own symbol on packaging of cook-chill foods which indicates to the consumer if the food is suitable for freezing at home.

Nut allergies

Some supermarkets may also have their own logo to show consumers that the product may contain nuts or may have been in contact with nuts during production.

Environmental information

The increasing awareness of some of the problems facing the world's environment has prompted many consumers to show more interest in conserving resources when purchasing and disposing of food packaging.

A variety of recycling/disposable symbols are to be found on food packaging and may influence the consumers' choice of foods – particularly if they are concerned about the environment.

Recycling

The following can be recycled and will have a symbol to show this.

Glass

- Glass can be used again to make 'new' glass, which is cheaper to produce.
- 'Bottle banks' are provided so that consumers may dispose of their glass bottles.
- Bottles may be deposited according to the colour of the glass.

Aluminium

- Aluminium can be recycled to produce new containers, which is cheaper than starting from new and helps to conserve energy.

Packaging materials

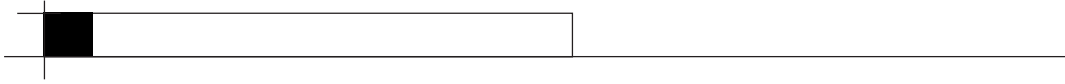
- A symbol is found on paper, card or packaging materials. This indicates that recycled material has been used for that package, and also that it may be recycled again.

Plastics

- Symbols on plastic will identify the type of plastic and if it can be recycled.

Disposal

The Tidyman symbol encourages consumers to protect the environment by disposing of rubbish carefully. This symbol is found on snack foods such as crisps and cans of drink.



SECTION 6**Government agencies and public bodies****Roles and responsibilities of DEFRA and SEERAD****Elaboration**

- composition of food
- negotiation with the EU on the Common Agricultural Policy
- new product processes
- promoting better use of natural resources
- providing guidance and information for food producers
- radiation contaminants

General overview and information on protection of wildlife and countryside. Information and guidance on environmental protection.

What does DEFRA do?

The Department for Environment, Food and Rural Affairs deals with a wide range of issues from climate change and biodiversity to foot and mouth disease and the EU Common Agricultural Policy. It works for the essentials of life – food, air, land, water, people, animals and plants.

This department oversees the regulation of the food industries in the UK, including animal welfare, safety standards and environmental issues. DEFRA has roles in both European Union and global policy making, so that its work has a strong international dimension.

The Scottish Executive Environment and Rural Affairs Department (SEERAD) is the Scottish version of DEFRA. It is responsible for advising Scottish ministers on policy relating to agriculture, rural development, food, the environment and fisheries, and for ensuring the implementation of these policies in Scotland.

The aims of DEFRA are to support sustainable development, which means a better quality of life for everyone, now and for generations to come. This includes:

- A better environment at home and internationally, and sustainable use of natural resources.
- Economic prosperity through sustainable farming, fishing, food, water and other industries that meets consumers' requirements.
- Thriving economies and communities in rural areas and a countryside for all to enjoy.

DEFRA is responsible for:

- Protecting and improving the environment, e.g.
 - improving air quality.
 - promoting an effective and competitive water industry which provides high-quality drinking water.
 - preserving a healthy marine environment.
 - protecting health, with controls over the release into the environment of chemicals, genetically modified organisms and radioactive substances.
 - reducing pollution, especially from gases like carbon dioxide emissions that affect the atmosphere and climate.
- Development of the economy in rural areas, e.g.
 - making an attempt to reduce rural poverty through the development of the economy.
 - ensuring agriculture contributes to the development of the rural economy.
 - addressing the needs of people living in rural areas. They want to help people in rural areas to have jobs and money, a sense of community and fair access to transport, housing, health services, schools and technology such as the internet.
- Promoting a sustainable, competitive and safe food-supply chain which meets consumers' requirements, e.g.
 - safeguarding the continuing availability to the consumer of adequate supplies of wholesome, varied and reasonably priced food and drink.
 - looking at the way food is produced and how it reaches consumers. DEFRA want to make sure that the people who

produce food can make a profit, without damaging the environment and are therefore encouraging farming processes that do this.

- encouraging the development of local, speciality and other value products and new product processes.
- Promoting modern and adaptable farming methods at home and throughout the EU, e.g.
 - finding ways to prevent future animal, plant and fish disease outbreaks and to help affected areas to recover.
 - modernising agriculture to increase competitiveness
- Promoting better management and use of natural resources, e.g.
 - cutting down on the amount of waste that is produced.
 - DEFRA also want to meet tough targets for recycling by encouraging positive environmental practices such as increasing household waste recycling and composting.
- Protecting public health in relation to diseases which can be transmitted through food, water and animals and ensuring high standards of animal health and welfare, e.g.
 - reducing the risks of future outbreaks of all animal diseases like BSE and foot and mouth.
 - if these diseases do occur, DEFRA want to make sure that they can control them and are responsible for putting in place procedures to allow this to happen (both prevention and control).
 - ensuring that farmed animals and fish are protected by high welfare standards and do not suffer unnecessary pain or distress.
 - ensuring that as wide a range as possible of high-quality, safe medicines are made available to animals.
- Within the food industry DEFRA is responsible for giving guidance on a range of foods, e.g.
 - providing guidance and information for egg and poultry producers.
 - providing guidance and information for the new EU beef-labelling system.
 - providing information on the speciality food and drink sector, e.g. hand-made chocolates, small-scale cheese production.

Role and responsibilities of the Environmental Health Department (EHD)

Elaboration

- Enforcing the Food Safety Act 1990
- Visiting food businesses, identifying potential hazards, carrying out risk assessments
- Issuing of improvement notices
- Taking samples of food to be tested
- Closing down of premises
- Giving advice/training/support

Environmental Health Departments employ Environmental Health Officers who protect the interests of the consumer.

Environmental Health Officers (EHOs) have responsibility for:

- enforcing the Food Safety Act 1990 in relation to the local community and so ensuring that consumers are protected against the risk of food poisoning
- enforcing hygiene regulations covering food premises and for general food safety.

Procedure for enforcing the Food Safety Act 1990

- Officers can enter food premises on a routine check or to investigate complaints.
- Officers will identify potential hazards in the food chain and carry out risk assessment.
- Officers can inspect food to see if it is safe, and retain, seize or condemn food.
- When officers enter food premises they can take away food samples to be tested and make videos to record what they see.
- Failure to comply with food hygiene regulations may result in the service of an improvement notice, which specifies the contravention, the improvements required and the time allowed to make the improvements.
- If the officer is satisfied that there is an imminent risk of injury to health an emergency prohibition notice may be served and this could mean that premises would be closed immediately, or a certain piece of equipment or process must not be used. An application for an emergency prohibition order must be made to the court within three days of serving this notice.

- The court may also impose a prohibition order on the proprietor or manager participating in the management of any food business.

Due diligence

'Due diligence' is the principal defence under the Food Safety Act 1990, and enables the defendant to be acquitted of an offence if they prove that they 'took all reasonable precautions and exercised all due diligence to avoid committing the offence'.

To prove that reasonable precautions have been taken involves setting up a system of procedures and controls and checking that these systems are operated properly. Clear, written records referring to specifications, training, testing, cleaning and codes of practice are essential.

Problems with implementing the Food Safety Act 1990

- There may be insufficient Environmental Health Officers to fully implement the Act, and, therefore, the consumer may not be fully protected.
- The cost of implementing the Act to food premises is expensive, and, therefore, the consumer may face increased costs to buy the end-product.
- There are numerous food premises opening and new products on the market daily. So enforcing the Act is difficult and may mean that the consumer is not fully protected.

As well as enforcing legislation, the Environmental Health Department works closely with schools and community organisations, providing advice, training and support on local environment, public health and food-safety issues. This is very useful in protecting the interests of consumers, because it helps raise consumer awareness of the function of the EHD and informs them of actions/steps to take when issues arise.

Role and responsibilities of the Food Standards Agency (FSA)

Elaboration

- Protection of public health in relation to food hygiene and food safety
- Licensing of meat-processing companies and hygiene controls on meat and meat products
- Controlling the production of novel foods
- Control of genetically modified food
- Licensing and inspection of manufacturers who produce irradiated food
- Monitoring the use of food additives
- Monitoring the composition of food and food labelling
- Advice about the nutrient content of foods and dietary issues

The Food Standards Agency (FSA) is an independent food safety watchdog set up by an Act of Parliament in 2000 to protect the public's health and consumer interests in relation to food.

The Food Standards Agency aims to

- reduce food-borne illness by improving food safety throughout the food chain
- help people to eat more healthily by providing information on healthy eating matters
- promote honest and informative food labelling to help consumers make informed choices
- promote best practice within the food industry
- improve the enforcement of food law.

The Agency regularly consults with consumers to understand their views and concerns so that it can meet their needs.

How the Food Standards Agency protects the consumer

Food safety

- Protects the interests of consumers well because it carries out enforcement and monitoring of the food industry to make sure high standards of food safety are maintained in food production.
- Protects the consumer through effective enforcement and monitoring of food-related regulations and policies such as:
 - Controlling genetically modified food for human consumption to ensure consumers receive safe food
 - Monitoring the use of food additives
 - Licensing and inspection of manufacturers who produce irradiated food
 - Licensing of meat-processing companies and for maintaining hygiene controls on meat and meat products
 - Looking at and controlling the production of 'novel foods' being developed by manufacturers.
- Consults widely with agencies on food-safety matters before issuing information and advice to the public, thus ensuring that the information received is accurate and appropriate.
- Provides advice to the public and to the government on food safety, nutrition and diet-related matters, and ensures that the consumers are protected from any bad practice within the food industry.
- At EU level the FSA represents the UK on matters of food safety and food standards both in the EU and world wide; this helps make sure that all imported food meets the necessary regulations and is safe to eat.

Monitoring the composition of food and food labelling

- Protects the interests of consumers by ensuring the food labelling put on products by manufacturers is accurate and easy to understand. This helps the consumer:
 - make informed food choices
 - store and cook food safely and so help prevent outbreaks of food poisoning.
- Protects the interests of the consumer by making sure that all food labelling complies with the appropriate legislation.

Advice about the nutrient content of foods and dietary issues

- Gives advice to the public on food safety and nutritional matters, so protecting the consumer by raising awareness, and helping to educate the public through leaflets, posters and a website which has on-line experts on nutrition and health to answer queries.
- Commissions research into food matters, e.g. on diet habits and labelling, so that the public are kept up to date through reports which are issued.

However

- The FSA works within a budget and is therefore limited in what it can do in protecting the consumer.
- It is a government-controlled organisation and is therefore answerable to the government. This means that it is unable to work completely independently – which is not always in the best interests of the consumer.
- Many consumers may not know about the existence of the FSA – information is not readily available regarding its role in protecting consumers, so may be of little consequence to them.

Role and responsibilities of Trading Standards Departments and Consumer Protection Departments

Elaboration

- Enforcing the Food Safety Act 1990 where it deals with the labelling of food
- Enforcing the Weights and Measures Act 1963
- Enforcing the Trades Description Act 1968
- Responsible for ensuring that all foods are sold in metric weights
- Testing samples of food and drink for safety and quality

The Trading Standards Service is responsible for enforcing over eighty Acts of parliament.

The role of Trading Standards Departments is to promote a fair market in consumer goods and services in England, Scotland and Wales. Trading Standards Departments are a function of local government and are funded by local tax money. Each local authority is responsible for its service and decides its priorities and resources.

In England, Scotland and Wales, local authorities are responsible for enforcing a wide range of statutory provisions in relation to consumer protection and for bringing criminal prosecutions where necessary.

Local authority Trading Standards services protect consumers and honest traders by ensuring that trade is carried out lawfully, fairly and safely.

The role of Trading Standards Officers

Trading Standards Officers enforce:

- **The Weights and Measures Act 1963** – It is an offence to sell food items without the quantity of the goods being indicated on the package. Pre-packed foods have to be sold in prescribed metric measurements.
- **The Weights and Measures Act 1985** – This Act makes it illegal to give short weight or an inadequate quantity. Trading Standards officers make sure that consumers are not given less than they have paid for and that traders do not use inaccurate weighing and measuring equipment.

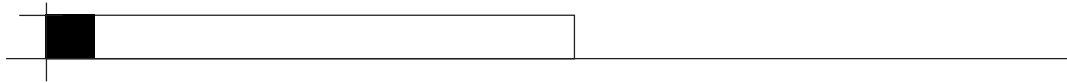
- **The Trades Description Act 1968** – It is an offence for any trader to falsely describe either by word, writing or drawing, any goods he is selling.
- **The Food Safety Act 1990** when dealing with food labelling and composition of food. Under the Food Safety Act, Trading Standards Officers may:
 - (a) take samples of food.
 - (b) analyse these samples to check condition and to ensure that content is as stated.
 - (c) start legal action if food is falsely described or labelled.

Details of these steps are as follows:

- (a) **Sampling food**
 - Trading Standards Officers have the power to take samples of food which may be deemed to be breaking consumer protection laws relating to the **composition of foods**.
 - They have the power to take samples of foods which may be deemed to be breaking consumer protection related to the **condition of food**.
 - Formal sampling of food by an authorised officer requires food to be purchased.
 - Informal sampling of food by an authorised officer can be done by requesting samples.
 - Sampling can take place of food which appears to be intended for sale.
 - A sample can be taken from any food source which is found in the premises.
- (b) **Analysis of food**
 - Samples of food have to be submitted to a recognised/qualified person, i.e. public analyst/food examiner.
 - Methods used to analyse foods are laid down and must be followed.
- (c) **Court procedures/legal action**
 - The local authority Trading Standards Officer who is investigating a contravention of food safety will notify the police.

- The local authority Trading Standards Officer and the public analyst will assist the prosecution with their case by providing details about the offence.

A person found guilty of offences under the Act may be liable to a fine of up to £20,000 and/or imprisonment for up to 6 months, although in serious cases unlimited fines and up to 2 years' imprisonment may be incurred.



SECTION 7**The law and Acts of Parliament****The difference between civil and criminal law****Civil law**

- Civil law deals with the rights and duties of individuals.
- One of the main areas of civil law that applies to consumers is the **law of contract**.
- Every consumer transaction is based on the law of contract. The consumer agrees to buy goods or services and the buyer agrees to provide them.
- The law will determine whether a promise can be legally enforced and what are the legal consequences if it is broken.
- Some examples where the consumer could be helped under civil law are:
 - If you made a contract with a supplier and they have let you down, for example by not delivering goods on the agreed date
 - If a shop sold you faulty goods then refused to give you a refund
 - If you lent a friend something which they refused to return to you then this could be dealt with by civil law. You could sue for the return of your property and if the court thought that you had a fair claim then your friend might have to pay you compensation or damages.

Criminal law

- Criminal law is concerned with establishing social order and protecting the community.
- It gives us rules for peaceful and safe living.
- People who break these rules can be prosecuted not only by the police but also by the Trading Standards Officers, and Environmental Health Officers.
- Many consumer laws come under the criminal category. Some examples are:
 - traders can be prosecuted for serving short measures, or charging more than the advertised price. These problems would be investigated by the Trading Standards Department.
 - a food restaurant with poor hygiene could be investigated or even closed by the Environmental Health Department.

The Trade Descriptions Act 1968 (criminal law)

Elaboration

It is an offence:

- To falsely describe goods
- To mislead consumers about services

This Act sets out to protect consumers from traders who either deliberately or accidentally mislead their customers. It states that consumers must not be misled by descriptions (oral, written or visual) given by the seller relating to goods or services being sold and so ensures that all information provided will be correct.

It is a criminal offence:

- To give a false oral, written or visual description of goods.
- To supply goods with a false description.
- For an employer, trader or employee to falsely describe goods they are selling.
- For traders to knowingly mislead consumers about the services they provide.

Relevance to consumer

1. It is a criminal offence if a trader falsely describes the goods he or she is selling, for example:
 - If a set of saucepans is described on the box as aluminium with a non-stick coating, then that is exactly what they should be.
 - If the label on a fruit pie shows a cross-section overflowing with whole pieces of juicy fruit, then the actual filling should not be a fruit-flavoured puree.
2. The Act also makes it illegal for traders to knowingly mislead you about the services they are providing, for example:
 - If a food delivery service is claiming to deliver free, then there should be no extra charge for delivery.
3. It is illegal for traders to describe falsely what they sell in writing, in advertisements (including those on radio or television) or by word of mouth.

The Trade Descriptions (Place of Production) (Marking) Order 1988

Elaboration

If food is presented in such a way as to give a misleading impression of where it was manufactured or produced it must be clearly labelled to show its country of origin or production

This is an order made under the Trade Descriptions Act. It says that if goods are presented in such a way as to give a misleading impression about where they were manufactured or produced, they must be clearly labelled showing their country of origin or production.

The Food Safety Act 1990 (criminal law)

Elaboration

- Covers four main areas:
 - Labelling
 - Additives and contaminants
 - Composition (or content)
 - Public health and hygiene.
- It is a criminal offence to:
 - sell, or possess for sale, food which does not comply with food safety requirements
 - render for sale food that is injurious to health
 - sell food which is not of the nature or substance or quality demanded
 - falsely or misleadingly describe or present food.
- Food premises must be registered with the local authority.
- All food handlers must be trained and wear suitable clothing.
- Improvement notices can be issued to premises failing to comply with the law.
- Defence of 'due diligence'.

The Food Safety Act 1990 was introduced to take account of the changes in food technology and eating habits. It was designed to help reduce the number of cases of contamination and food poisoning. It applies to food businesses throughout the UK and ensures all food produced and sold is safe to eat.

'Food' includes:

- anything used as a food ingredient
- animals that are eaten
- drinks
- slimming aids and dietary supplements.

The Act offers the following benefits to the consumer:

- The whole food chain from the farm or factory to the point of sale is covered by the Act – so it ensures safe food for consumers (public health and hygiene).
- This Act aims to prevent the sale of food which is of inferior quality, and therefore the consumer is reassured that they are purchasing a quality product (composition).
- Anyone working in the food business, no matter the size of their business, must conform to this Act, and food premises must be registered with the local authority – this ensures good hygiene standards and safe food for consumers (public health and hygiene/contaminants).
- All food handlers have to undergo food hygiene training and wear suitable clothing, in order to protect the consumer from the risk of food poisoning (public health and hygiene).
- This Act makes it an offence to produce or sell any food which may be injurious to health and so prevents food poisoning (public health and hygiene). Improvement notices can be issued to premises failing to comply with the law.
- Food labelling must be accurate, so that the consumer will be able to make an informed choice. This can relate to allergies to certain ingredients such as nuts and additives that may cause hyperactivity or other adverse reaction (labelling).
- The Act refers to false claims and misleading descriptions, so the consumer can be confident that the food purchased is as stated on the label – see further details below.

Food labelling

Food labelling

- Detailed food labelling regulations are laid down under the **Food Safety Act 1990**.
- Food labels help us to know what we are buying and help us to make informed decisions.
- A food label provides information from the food manufacturer to the consumer.

Requirements for labelling and current statutory food labelling regulations: see page 59.

False claims on food labelling are not allowed. For example:

- Manufacturers must be able to fulfil any claim made on the label, e.g. nutritional claims.
- Claims such as 'low sugar' and 'high fibre' must be supported by nutritional labelling.
- Complaints about misleading advertisements may be referred to the Trading Standards Department or Advertising Standards Authority (ASA).

Additives must meet the requirements of the Food Safety Act 1990 and are controlled as follows:

- Additives include antioxidants, colours, emulsifiers and stabilisers, preservatives.
- Additives can only be used in foods in the UK if they are permitted by the government.
- Most UK additives must go through a long and strict safety review to get, and to stay approved.
- An 'e' number shows that an additive is accepted as safe all over the EU.
- Any additive allowed in the UK is considered safe for almost everyone, although a few people may have an allergic reaction.
- If a food company wants a new additive approved, the first step is to prove the safety of the additive to the government's Food Advisory Committee.
- Safety tests are examined by the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) and this committee advises the government's Food Advisory Committee.
- Additives must be listed by type and chemical name or number.

- Additives must be listed on food labels like other ingredients in descending order of weight.

Enforcement

The day-to-day enforcement of the Food Safety Act is carried out by Officers in local government including Environmental Health Officers (see page 74) and Trading Standards Officers (see page 79).

‘Due diligence’

It is a defence for a person handling food to prove that they took all reasonable precautions and exercised **all due diligence** to avoid committing an offence either by themselves or by a person under their control.

Due diligence is the principal defence under the Food Safety Act 1990, and enables the defendant to be acquitted of an offence if they prove that they ‘took all reasonable precautions and exercised all due diligence to avoid committing the offence’. To prove that reasonable precautions have been taken involves setting up a system of procedures and controls, being aware of the likely hazards and risks, and checking that these systems are operated properly. Clear, written records referring to hazard analysis, training, temperatures, pest control, testing, cleaning schedules and codes of practice are essential.

It may be acceptable for a food operator to prove that someone else, not under their control, was responsible for an offence, and that they were relying on information provided, that reasonable checks were made and they could not reasonably have known that an offence was being committed.

Food Safety (General Food Hygiene) Regulations 1995

Elaboration

A criminal law with regulations covering three main areas:

- Hazard analysis and risk assessment
- General food hygiene
- Temperature control of food likely to support the growth of harmful bacteria.

The aims of these regulations are to ensure common food hygiene rules across the EU. They cover three main areas:

- hazard analysis and risk assessment
- general food hygiene
- temperature control of food likely to support the growth of harmful bacteria.

Anyone who owns, manages or works in a food business, apart from those working in primary food production such as harvesting, slaughtering or milking, is affected by these regulations.

The regulations apply to **all** premises, from restaurants and supermarkets to vans, vending machines and village halls. Whether you sell publicly or privately, in a hotel or in a marquee, for profit or for fund-raising, these regulations must be observed.

The regulations require:

1. ***Hazard analysis and risk assessment.*** Food businesses must identify any step in the food process which is critical to ensuring food safety and ensure that adequate safety controls are in place, maintained and reviewed. This is undertaken by implementing the hazard analysis critical control point (HACCP) system.
2. ***General food hygiene.*** Food premises must be clean and in good repair and designed to allow for:
 - good food-hygiene practices
 - adequate wash basins and flush lavatories
 - facilities for cleaning and disinfecting
 - satisfactory standards of lighting and ventilation
 - all surfaces must be easily cleaned and disinfected

- containers used to transport foodstuffs must be clean, in good repair and condition to protect foodstuffs from contamination
 - food equipment must be in good repair, easy to keep clean and easy to disinfect if necessary
 - food waste must be disposed of quickly and provision made for storage and removal
 - an adequate supply of potable (drinking) water must be provided
 - food handlers must have high standards of personal hygiene, wear suitable protective clothing and be free of any infection
 - food, including raw materials, must be fit for human consumption and stored and protected to minimise any risk of contamination
 - food handlers should be trained and supervised.
3. ***Temperature control of food likely to support the growth of harmful bacteria.*** No food must be kept at temperatures which would result in a risk to health. Raw materials and ingredients stored in establishments should be kept in appropriate conditions designed to prevent harmful deterioration and to protect them from contamination.

Hazard analysis critical control point (HACCP)

Elaboration

1. conduct a hazard analysis
2. decide on the critical control points
3. establish a tolerance level
4. establish a monitoring system
5. establish what action should be taken to correct the hazard if it occurs
6. establish procedures to check that the HACCP system works effectively
7. record keeping and review of procedures

This system operates from purchase of raw materials to service to the customer. There are seven stages involved in the HACCP system.

1. Conduct a hazard analysis

Potential hazards associated with a food, and measures to control those hazards, are identified during hazard analysis.

Hazards could be:

(a) *Contamination of various types*

- Biological such as bacteria, moulds, viruses
- Chemical such as cleaning chemicals or pesticides
- Physical such as foreign bodies like glass, pests, metal.

(b) *Temperature control during storage*

Bacteria and mould will multiply in foods if they are stored at higher temperatures than recommended or are left in warm conditions for too long.

(c) *Inadequate cooking*

If food has not had sufficient cooking time or has not reached the correct temperature then bacteria may survive.

Personal hygiene, cleaning and disinfecting of equipment, waste disposal and pest control are important at each step of HACCP. By identifying the stages where potential hazards might occur, controls can be put in place which can prevent bacterial growth or contamination.

2. Decide on the critical control points

These are the points in food production – from its raw state through processing and distribution to the consumer – at which the potential hazard can be controlled or eliminated. At each step of production there are likely to be several hazards. The points at which these hazards must be controlled to ensure food safety should be considered as critical points.

If a failure to control any hazard at this point could cause food poisoning or a serious food complaint (e.g. glass in food), then this step is called a **critical control point** and the hazard must be controlled or eliminated. Another example of a critical control point would be temperature control with a high-risk food such as chicken, where food safety would be maintained by keeping temperatures below 5°C.

If the hazard does not carry a food-poisoning risk, then good hygiene practice at this step should be sufficient to ensure good food safety – this is called a control point

3. Establish a tolerance level

Controls must be implemented to eliminate the hazard or to reduce it to a safe level. This stage establishes preventative measures with critical limits for each control point. For a cooked food, for example, the control might include setting the minimum cooking temperature and time required to ensure the elimination of food-poisoning bacteria.

4. Establish a monitoring system

Procedures must be established to monitor the steps. Monitoring involves checking to make sure that controls are effective and that they are being implemented throughout food production. Such procedures might include determining how and by whom cooking time and temperature should be monitored. Time and temperature are two very important factors and they should be precise and relatively easy to monitor.

Examples of monitoring include:

- Checking the temperature of the refrigerator frequently.
- Checking that staff wash their hands on entering the food preparation area.

- Checking that the core temperature of a joint of meat reaches 75°C.
- Checking that all equipment has been thoroughly cleaned and disinfected.

5. Establish what action should be taken to correct the hazard if it occurs

When monitoring has revealed a problem or when a complaint is received, then action to correct the hazard must be taken (corrective action).

Some examples of corrective action include:

- Disposing of food if minimum cooking temperature has not been met.
- Rejecting out-of-date stock.

6. Establish procedures to check that the HACCP system works effectively

An example of this could be a testing time and temperature recording device to verify that a cooking unit is working properly.

7. Record keeping and review of procedures

This would include records of hazards and their control, the monitoring that has taken place and any action taken to correct potential problems. Documentation of the system is not a legal requirement but detailed and accurate documentation will assist a defence of 'due diligence' in the event of a prosecution.

A review of procedures may be required if:

- The product or the controls are not satisfactory.
- The method of preparation changes.
- New equipment is introduced.

Advantages of the HACCP system

- Hazards are identified and controlled before production and at each stage of the process from raw materials through to the sale of the product. This should result in safe food for consumers so that they are not put at risk.
- Many food-poisoning incidents result from poor practices that are only discovered after an outbreak. By identifying hazards, the likelihood of such problems would be reduced.

- It ensures that food companies do not break the law and face prosecution.
- It helps food companies compete more effectively in the world market.
- Record keeping allows investigators to see how well a firm is complying with food safety laws.

Stages of manufacture and HACCP

The stages of manufacture involved in food production will vary according to the final food product. A basic outline of the stages involved in food production is given below and on the following pages. All these stages have to be closely looked at for potential hazards using the HACCP system.

1. Purchase of ingredients
2. Delivery of ingredients
3. Storage of ingredients
4. Preparation of ingredients
5. Cooking of ingredients
6. Chilled storage
7. Packaging
8. Distribution

Eight stages in food production where HACCP is used to ensure safe production

Stage	Importance of HACCP to each stage
1. Purchase of ingredients	<ul style="list-style-type: none"> • Raw materials which are purchased may contain harmful foreign bodies, e.g. flour could contain weevils • High-risk foods, such as fish, meat or cream, can present a hazard to health as they could be contaminated by bacteria • Ingredients should be purchased from a reputable supplier to guarantee quality and safety
2. Delivery of ingredients	<ul style="list-style-type: none"> • Checks should be in place to ensure that high-risk foods are delivered at temperatures between 0 and 4°C • Check temperature and condition of delivery vehicle • Date marks of dry stores/fats should be checked to ensure that there is sufficient time remaining for them to be used safely
3. Storage of ingredients	<ul style="list-style-type: none"> • Checks should be in place to ensure that high-risk foods such as chicken or cream are stored at temperatures between 0 and 4°C to prevent bacterial growth • Dry stores should be stored in a cool place and in sealed containers • Stock rotation system should be used to ensure that the FIFO (First In First Out) system applies • Use foods within the date mark • Containers should be sealed, to prevent the entry of pests, and labelled • Storage areas should be kept clean and free from dust and food debris that could attract pests • Raw and cooked ingredients should be kept separate to prevent cross-contamination
4. Preparation of ingredients	<ul style="list-style-type: none"> • Food handlers should follow strict food-hygiene rules to avoid possible contamination of ingredients, by wearing protective clothing.

(continued)

	<ul style="list-style-type: none"> • Equipment must be well cleaned and maintained to prevent possible contamination from equipment • Work surfaces and areas must be kept clean to avoid possible cross-contamination • Limit handling times during preparation especially of high-risk foods • Check no foreign bodies have entered the food during preparation as these could cause the consumer to choke, e.g. fish bones
5. Cooking of ingredients	<ul style="list-style-type: none"> • Cooking times and temperatures must be checked • Products must be thoroughly cooked to destroy bacteria • Routine temperature checks using food probes to check that core temperatures reach at least 75°C at centre
6. Chilled storage/cooling	<ul style="list-style-type: none"> • Cooked food must be cooled or chilled rapidly so that the danger zone is quickly passed through to prevent the growth of harmful bacteria • High-risk foods such as cream must be refrigerated at between 0 and 4°C immediately after preparation • There should be no contact with raw food, to prevent cross-contamination
7. Packaging	<ul style="list-style-type: none"> • Packaging should be sealed to protect food from contamination or physical contamination • Packaging may have to withstand chilling temperatures without breaking up when refrigerated • Packaging should be labelled to indicate how the product should be stored safely before eating
8. Distribution	<ul style="list-style-type: none"> • High-risk food or cook-chill foods should be distributed to retail outlets in a refrigerated vehicle at between 0 and 4°C • Temperature of vehicle should be checked and recorded before food is loaded into it at the factory and removed from it before unloading to the retailers

The Sale and Supply of Goods Act 1994 (criminal law)

Elaboration

There is a contract of sale between the seller and the buyer.

- Goods must be of a 'satisfactory quality'
- Goods must 'fit the description given'
- Goods must 'be fit for the purpose' as made known to the seller
- Consumers have a reasonable period of time to accept the goods or reject them

To benefit from this Act, consumers must have entered into 'a contract of sale'. The Act defines this as 'a contract by which the seller transfers or agrees to transfer the property in good faith to the buyer for a money consideration, called the price'.

This law provides the consumer with three areas of protection when buying goods and services. The goods must:

1. **Be of satisfactory quality**

- When you buy goods from a shop, supermarket stall or restaurant they must be edible and of satisfactory quality.
- 'Satisfactory' means that the goods would meet the standard a reasonable person would regard as satisfactory, taking into account the description of the goods, the price and any other relevant circumstances. Consumers could not expect that supermarkets' own brands would be of a different quality from supermarkets' finest or luxury ranges, given the difference in prices
- 'Satisfactory' includes the appearance and finish of goods, their safety and durability.

2. **Fit the description given**

- Goods must match the description given, e.g. if a beefburger is described as '100 per cent pure beef' then it should be exactly that.

3. **Be fit for the purpose**

- Goods must be fit for their intended purpose and must perform in the way that the seller has told the consumer they will, e.g. if the packaging of a food container is suitable for the microwave, then the consumer would not expect the packaging to disintegrate or melt in the microwave.

This Act also covers the following:

This Act also gives you a **reasonable** time to reject goods if they are faulty. What is '**reasonable**' is not a fixed period of time but will depend on the cost and complexity of the goods. Normally, you can take your purchase home and make sure it is satisfactory but, if you delay examining it or telling the seller about a fault, you may lose your right to reject it and to have your money refunded. A consumer will be thought to accept goods if they do not indicate rejection or make a complaint after a reasonable time has passed.

Online shopping deliveries will be covered by this part of the Sale and Supply of Goods Act if the supplier has substituted an item for another and the consumer is not satisfied; the consumer may then reject the goods. In addition, when the consumer checks the items and finds that the shelf-life of perishable items is too short, then the goods may be rejected.

If a customer asks for a repair to be done to faulty goods, this does not mean that they have to accept them once the repair has been done.

If you are returning goods, then you need to prove you bought the goods – you do not need to have a receipt (you could show a credit card statement) but a receipt is the easiest way.