



Food Science and Technology

Glossary

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Active packaging

Food packaging that interacts chemically or biologically with its contents so that its shelf life is extended or the product is modified during storage.

Additives

Substances added to food by the manufacturer that are not normally consumed alone as an ingredient. Additives can improve and preserve flavour, appearance (colour), and nutritional value, and extend shelf life.

Aeration

The process of incorporating air into a mixture or food product in order to increase its volume, improve texture and flavour. This can be achieved mechanically, chemically or biologically.

Anaerobic breakdown

A series of biological processes whereby microorganisms break down organic substances in the absence of oxygen; for example, fermentation.

Antioxidants

Chemicals found in plant foods that prevent oxidation. The chemicals prevent oxidative damage within the body as well as preventing fats and oils from turning rancid.

Aseptic packaging

Both the food and the packaging are sterilised separately, and then assembled in a sterile environment. The processes may include ultra-high temperature (UHT) and High Temperature/Short Time (HTST) products.

Biotechnology

The use of living microorganisms (animal, plant, protozoa) to create new products with specific characteristics and attributes; for example, developing or selecting microorganisms to make yoghurt with new characteristics, such as flavour, texture, or improved gut health for the consumer.

Caramelisation

Caramelisation occurs when carbohydrates like sugar are heat-treated causing them to turn brown; for example, caramel sauce or the browning of onions during cooking.

Cardiovascular disease

A term used for diseases of the heart and blood vessels. The term usually includes diseases, such as coronary heart disease, heart failure and stroke.

Chemical properties

Components of food, such as enzymes, acids, alkalis, moisture and nutrients, that enable foods to change during processing and storage.

Chyme

The mixture of partly digested food and digestive juices found in the stomach.

Coagulation

Occurs when there is a permanent change in the protein from a liquid to a semi-solid or thick mass as a result of a change in temperature (heat) or pH level or addition of chemicals; for example, scrambled egg, custard.

Coeliac disease

An autoimmune disease which impacts absorption of all nutrients due to damage to the villi caused by gluten, a protein, leading to difficulty in digesting foods.

Commodity

A food category referring to raw agricultural products; for example, wheat, corn, that are produced in large quantities by many different producers. After trade or purchase, commodities are processed into other higher value food products.

Consumer

A person who purchases or uses goods, products and services; for example, purchasing food at the supermarket.

Cross contamination

The transfer of microorganisms to food from other sources; for example, hands, equipment and other food or between unprocessed/raw material and processed/final food products.

Crystallisation

Techniques used to separate a solid that is dissolved in a liquid. For example, heating a syrup, which causes evaporation and leaves sugar crystals upon cooling. Acids help prevent crystallisation in supersaturated foods like honey and jam.

Demographic group

A population subset with similar characteristics, such as socio-economic state, age, education level, ethnicity.

Denaturation

The permanent and irreversible structural change of protein molecules in food. Denaturation occurs with changes in temperature (heat) or pH level or addition of chemicals or manipulation (mechanical actions); for example, beating egg whites, cooking of meat.

Dextrinisation

Browning and chemical change occurring to starch when subjected to dry heat. Upon heating, starch is broken down into dextrins causing the colour, taste, aroma and flavour of the food to change; for example, browning of bread during baking.

Embargo

When a country partially or completely stops trading with a particular country or groups of countries.

Emerging foods

Foods developed as a result of new technology that may enhance food characteristics, food production, food storage and packaging.

Emulsification

Prevents mixtures containing dissimilar liquids, such as oil and vinegar, from separating. For example, egg yolks are an emulsifier used to stabilise mayonnaise – an oil and vinegar emulsion.

Environmental factors

Conditions created by an environmental event, such as weather events, temperature, sunlight and soil type, which affects the production of food and the survival of organisms.

Enzymatic activity

Chemical reactions that occur at enzyme reactive sites resulting in the conversion of one molecule into another. The rate of enzyme activity may be influenced by factors such, as pH level, temperature.

Enzymes

Protein molecules found in food that acts as biological catalysts causing food to change; for example, ripen or brown (enzymatic browning).

Ethics

Moral principles that govern a person's or a group's behaviour.

Fair trade

Seeks equity in international trade. Fair trade contributes to sustainable development by offering better trading conditions for workers and producers in the developing world.

Fermentation

The anaerobic conversion of sugar to carbon dioxide and alcohol by yeast. The properties of molecules are altered, producing a desired product with a different flavour, easier digestion and increased nutrition and shelf life. Examples of fermented foods and beverages include sauerkraut, yoghurt, kefir and lager.

Food allergy

Abnormal reaction by the body to a food protein. The reaction causes the immune system to produce antibodies that react with the allergen causing severe symptoms, including anaphylaxis. Most food allergies are caused by peanuts, tree nuts, milk, eggs, sesame seeds, fish, shellfish, soy, wheat and lupin.

Food and beverage advertising practices

Techniques and strategies used to promote food and beverages to consumers, such as colour, slogans, music and graphics.

Food distribution

The process of supplying and transporting food to consumers.

Food diversity

Wide ranging food and food products that individuals consume, for example, culturally diverse foods or foods from various food groups.

Food handling practices

Working practices, which promote food safety.

Food intolerance

A non-allergic hypersensitivity to a certain food. Food intolerance is not an immune response, rather a chemical reaction that occurs after eating or drinking some foods. Food intolerance has been associated with asthma, chronic fatigue syndrome and irritable bowel syndrome. For example, lactose intolerance is a reduced ability to digest milk sugar due to insufficient gut enzyme, lactase.

Food miles

The distance a food travels from the place it is produced to the point it reaches the consumer, that is, distance from 'paddock to plate'.

Food packaging

A way of storing or containing food to ensure safety and stability is maintained and looks appealing.

Food poisoning

Illness caused by consuming food that has been contaminated by chemicals, viruses or any other pathogenic microorganism.

Food processes

Transforming raw animal or plant produce into edible food and different food products.

Food products

Primary and secondary processed food sold to consumers for consumption.

Food security

When all people at all times have access to necessary, safe, nourishing, culturally acceptable food to sustain a healthy active life.

Food spoilage

Damage to food, which causes deterioration in the colour, flavour, odour or consistency of a food product.

Food sustainability

The processing and trading of food in ways that contribute to local economies, protect the diversity of animals and plants, and avoid damage to the environment or depleting natural resources to ensure long-term availability.

Food systems

The combined actions of people, processes and infrastructure to produce food for a population.

Fortification

The deliberate addition of specific micronutrients to processed foods. Fortification can be used to replace nutrients lost during food processing or correcting a demonstrated dietary deficiency in the population, for example, addition of vitamins to cereals.

Free trade agreement

A treaty between two or more countries to create a free trade area where they can trade goods and services without tariffs or other deterrents.

Functional foods

A food or food component to which an existing ingredient or a new ingredient has been added to provide additional benefits, usually for disease prevention or improved health. Foods that have a potentially positive effect on health beyond basic nutrition.

Functional properties

Functional properties alter the physical and chemical characteristics of protein, carbohydrate and lipid (macronutrients) containing foods when they are exposed to air, heated, cooled or come into contact with acids or alkalis during processing, preparation, presentation or storage.

Gelatinisation

The process through which starch granules are mixed with a liquid, heated, and burst, then absorb the moisture to form a gel; for example, sauce making.

Genetically modified foods

The use of biotechnology to alter the genes of a living organism, such as an animal or plant in order to improve the characteristics of that animal or plant; for example, increased yield, increased nutritive value, increased insect resistance.

Globalisation

Process of international integration and breaking down of barriers to make a united global community, such as the movement of people, money, goods and services due to increased global trade and investment.

Hazard Analysis Critical Control Point (HACCP) system

A food safety system that aims to prevent food contamination through the identification of potential hazards and their control points during all stages of food production, storage and transport.

High pressure processing

A technological process that uses high pressure to destroy microorganisms and enzymes whilst retaining food quality.

Innovation

Creation of something new or different, taking the form of new foods and technologies that affect the development, production, distribution, marketing and storage of food.

Intelligent packaging

Packaging that can sense changes and inform the consumer of food manufacturer effects.

Leavening

With the application of mechanical actions, an agent is added to a food product, such as a dough or batter to cause baked goods to rise. Usually an acid is added to an alkali or a biological agent is used and when heated in the presence of moisture a gas is produced. This causes expansion of mixtures and baking produces products with porous structures. Agents could include mechanical incorporation of air, steam, yeast, baking powder and baking soda.

Line extension

The use of an established product brand name for a new item in the same product category. Occurs when a food manufacturer/producer introduces additional items in the same product range using the same brand names, including new flavours, forms, colours, added ingredients and/or packaging sizes.

Macronutrients

Nutrients that the body requires in relatively large amounts to provide kilojoules and perform other functions. The three macronutrients are proteins, carbohydrates and lipids.

Maillard reaction

Occurs when a protein and sugar or starch react in the same mixture and when dry heat is applied, such as baking, creates a golden brown colour on the surface of the food and a distinctive aroma.

Malnutrition

A condition resulting from a diet where not enough or too many nutrients are consumed. This may contribute to further health conditions.

Marketing mix

The basis of a company's marketing plan to encourage the consumer to purchase their product/service.

- Product: an item offered for sale
- Place: the distribution and placement in a supermarket of a food product to the consumer at the right time and location in an aisle
- Price: the amount of money expected, required or given in payment for the purchase of a food product
- Promotion: the method used by a business to inform, persuade and remind a target market about its products.

Marketplace

A place where consumers can purchase products; a physical location or an online platform.

Market research

The organised collection and analysis of consumer information (needs and wants) used by companies to guide decisions regarding new product development, overcoming problems or discovering new opportunities.

'Me too' products

A food product designed to be similar or to imitate a product made by another company.

Membrane technology

Separation processes involving use of a semi-permeable membrane to segregate particles out of a fluid, for example, reduction of milk's fat percentage.

Microbial contamination

Deterioration of the sensory, physical or chemical properties of food due to exposure to conditions that result in the production of moulds, yeasts or bacteria.

Micro-encapsulation

Small particles of a functional ingredient packaged in a minute capsule for inclusion in a food.

Micronutrients

Vitamins and minerals, are the nutrients required in relatively small quantities to perform a variety of functions in the body.

Micronutrient supplements

Products for consumption that contain ingredients intended to add further nutritional value to support the diet.

Mise-en-place

A French term meaning to have everything in its place. Refers to everything that must be made ready before food preparation and service begins.

Modified atmosphere packaging

A packaging container is flushed with three gases (carbon dioxide, nitrogen and oxygen) with the mix dependent on the physical and chemical properties of the food. The unique combination of the gas trio combined with a lowered temperature results in extended shelf life, minimisation of waste, improved quality and presentation and reduction in the need for artificial preservatives.

Modified foods

Foods having an altered characteristic; for example, less salt, less sugar, more fibre, increase in vitamins or minerals. Modifying an existing food can create more nutritious products and enable a company to extend their product line and thus cater for a larger variety of consumers.

Nanotechnology

Manipulation of matter at the molecular scale.

Oxidation

An irreversible process by which molecular oxygen combines with nutrients in food, a process that decreases the quality of the food by creating rancidity. It occurs in peeled fruits and vegetables, such as bananas, apples and potatoes, as well as fats and oils.

Pasteurisation

The process of heating a liquid to a specific temperature for a predefined length of time and immediately cooling it. The process slows spoilage due to microbial growth.

Peristalsis

The wave like movement of the muscles in the gastrointestinal tract. These muscle contractions move the substances along the tract.

Physical properties

Properties that determine a food's size, shape, colour, volume, viscosity and elasticity properties.

Phytochemicals

A variety of biologically active non-nutrient plant chemical compounds that have beneficial effects on the body.

Phytoestrogens

A group of phytochemicals that are converted by gut bacteria into hormone-like compounds that imitate the human hormone oestrogen.

Preservation

The processing of food to eliminate or control conditions that cause spoilage; for example, dehydration, canning, freezing, jam making, pickling, ultra-heat treatment.

Primary food processes

Used to convert raw materials to food commodities, for example, milling wheat into flour.

Probiotics

Live microbial food supplements or foods with naturally occurring live bacteria, such as fermented foods, have significant health benefits for the gut when consumed. Live microorganisms are found naturally in foods, such as yoghurt, kimchi, sauerkraut and kefir.

Processing techniques

- exposure to temperature; for example, application of heat, such as blanching, canning; application of cold, such as refrigeration, freezing
- exposure to air
- change of pH level; for example, use of acid, such as vinegar, lemon juice
- addition of chemicals; for example, use of salt for salted olives, lemons; use of sugar for jams and preserves
- removal of moisture
- manipulation; for example, beating, chopping.

Production plan

Outline showing the sequence and timing of tasks, equipment and resources involved in producing one or more products/recipes or components of a product/recipe.

Prototype

A preliminary version of a product from which improved versions are developed.

Quality assurance

A guarantee that manufacturing standards will be maintained so that the food product remains consistent.

Quality control

The techniques and activities used to produce products and services economically and consistently to meet or exceed consumer requirements.

Qualitative method

Tests used to rate/rank the sensory properties of food. Used by food producers to ensure the product appeals to the consumer. Used in the development of new products or improvement of existing product lines. Descriptive research that uses words, perceptions and feelings.

Quantitative method

The use of numerical data and statistics to measure product features, including size/height, weight, volume, texture, colour, viscosity, shelf life, gel and nutrient content. Provides an accurate, objective report on specific features of a product.

Rancidity

The spoilage and decomposition of fats, fatty acids and oils through exposure to oxygen. Causes an unpleasant odour and flavour in food.

Recommended Dietary Intake (RDI)

A nutrient reference value indicating amounts of energy, nutrients and other dietary components to best support health and wellbeing.

Secondary food processing

The conversion of ingredients into edible products. This process involves combining foods in a particular way to change its properties, for example, heating cake batter to form a cake.

Sensory properties

The characteristics of food that encompass the senses, such as appearance, texture, aroma, flavour, sound.

Service

An intangible commodity in the form of an experience, an action or an activity that provides the consumer with a benefit.

Product specifications

A clear outline of the main features, properties and attributes of a food product and any other requirements that must be met in order for the product to be successful.

Stabilisers

Substances or chemicals that allow food ingredients, which do not mix well, to remain in a homogenous state after blending and/or processing. Stabilisers may work in combination with emulsifiers. Common stabilisers include carrageenan, gelatin and pectin.

Staple foods

A food that makes up the dominant part of a population's diet. They are eaten regularly and are generally high in energy and carbohydrate. Common staple foods are of either cereal origin, such as rice, wheat, maize (corn), barley and rye or a starchy root vegetable, such as potato, yams, taro and cassava.

Subsidy

A payment made to producers to encourage local production, supplement income and assist their operations.

Sustainability

Producing, manufacturing and transporting food in a way that maintains an ecological balance to ensure sufficient healthy food is available for future generations.

Tariff

A tax that adds to the cost of imported goods.

Technology process

A process used to create or modify products, processes, systems, services or environments to meet human needs and realise opportunities.

Ultrafiltration

A process where a liquid is passed over membranes, which have minute pores that prevent macronutrients, such as protein, from passing through.

Vacuum packaging

A packaging method where all of the air is mechanically removed from the package prior to sealing, in order to prevent the growth of certain microorganisms and enzymatic reactions.

Value-add

Any step in the production process that improves the product for the customer and results in a higher net worth (or value). All processed foods are the result of value-adding to basic food commodities, for example, wheat to bread.

Waste management

The controlled disposal of any food substance or food packaging, to minimise environmental and health impacts.