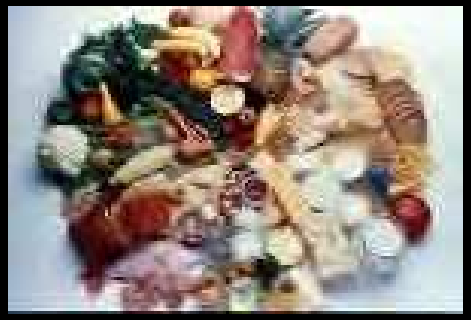
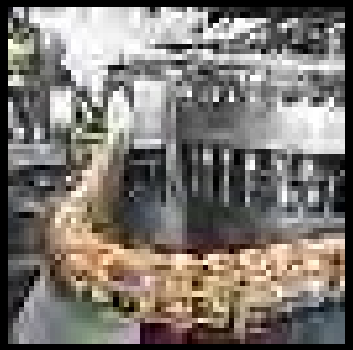


FOOD TECHNOLOGY AND PRODUCTION

CHAPTER 6



KEYWORDS

ENGLISH	BAHASA MELAYU
Bleach	
Canning	
Dehydration	
Emulsifier	
Flavouring	
Irradiation	
Pasteurisation	
Preservative	
Stabiliser	

METHODS AND SUBSTANCES USED IN FOOD TECHNOLOGY

- Food is processed to:
  - make the food last longer
  - kill the microorganisms or at least to prevent the growth of certain bacteria and fungi which can cause food poisoning.
- Added with food additives to:
  - enhance the taste, appearance and nutritional quality (added vitamins and minerals)

The functions and examples of the chemical used

Type of chemical	Function	Example	Uses
Preservatives	To protect against microorganisms which cause spoilage and food poisoning		Fish ball, noodles
			Chillie sauce, fruit juice
			Jam, cordial drink
Colouring	To compensate for colour lost in processing and to impart colour to food	Natural colouring (a) Pandan leaves	Traditional cakes
		(a) Caramel	Cordial drink
		Artificial colouring (a) Carmoisine	Soft drinks

Type of chemical	Function	Example	Uses
Bleach	To get rid ofundesirable colour		Noodles
		Activated carbon	Pure sugar cane juice
Flavouring	To impart flavours orto compensate forcolour lost in processing	Vanilla	Cakes, ice cream
		Monosodium glutamate (MSG)	Soy sauce, instant noodles, instant soup
Stabiliser	To give food thedesired texture andconsistency	Modified starches	Frozen food
			Jam
		Locust bean gum	Ice cream
		Xanthan gum	Salad dressing

Type of chemical	Function	Example	Uses
Sweetener	To replace sugar in low-calorie foods and to provide sweetness	Natural sweetener (a) Honey (b) Artificial sweetener (a) (b) Xilitol (c)	 Soft drinks, cakes Traditional cakes. Cordial drink Specialised food for diabetics Jam, soft drinks

Type of chemical	Function	Example	Uses
Antioxidants	To retard oxidation of oils and fats which would result in the formation of toxic products and loss of nutritionally important constituents	Ascorbic acid Ascorbyl palmitate Butil hydroxyanisol (BHA)	Cooking oil Margarine Vitamin supplement
Emulsifier	To manufacture foods containing fats/oils and water	Lecithinono and diglycerides	Chocolate Ice cream

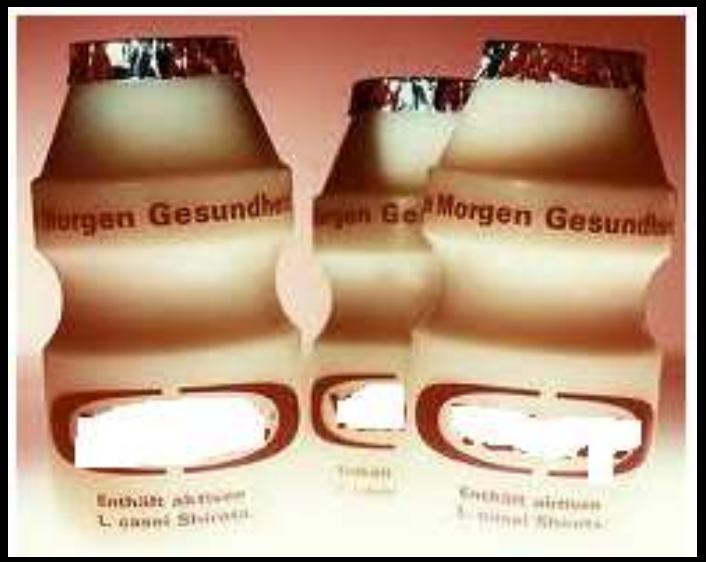
Food Processing

- The technology used in food processing includes:

Pasteurisation	Cooling
Dehydration	Irradiation
Freezing	Canning
Freeze Drying	Vacuum packaging

Pasteurisation

- Involves heating food at a temperature of 63°C for 30 minutes or 72°C for 15 second followed by instant cooling.
- Kill yeast, moulds , and bacteria but not bacterial spores.
- Used for milk and juice



Dehydration

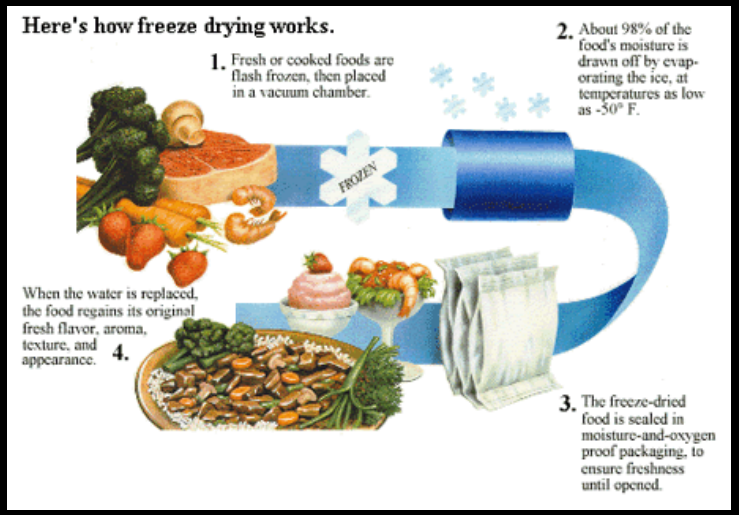
- Uses heat, reduced pressure, or both to remove moisture from food.
- The microorganisms cannot grow and spoil the food - Raisins, peas, mushrooms, fish.
- Method of dehydration is sun drying, tray drying, tunnel drying, spray drying, pulse-combustion drying and drum drying.

Freezing

- Preventing the growth of microbes that spoil food or by reducing the food-spoiling chemical reactions.
- Frozen foods should be stored at temperatures of -18°C or below.
- Used for meat, fish, poultry, and juices.

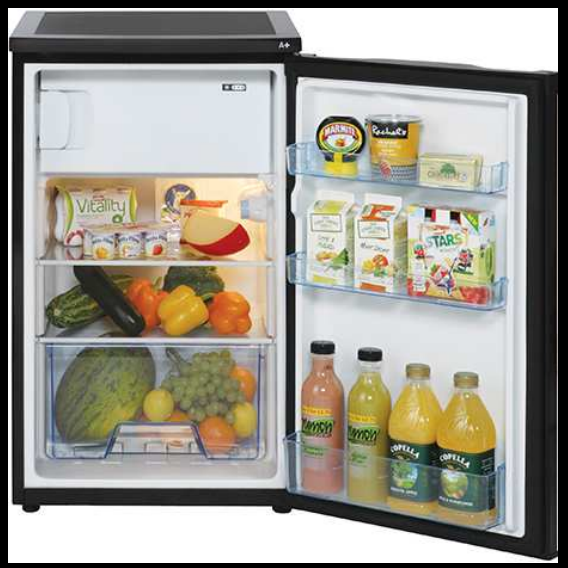
Freeze Drying

- Used extensively for preserving food like coffee, tea, juices, shrimps, chicken, and certain fruits and vegetables.
- Water in the form of ice is removed from a substance - Retains most of its flavour
- Expensive than other drying methods that use the air or sun.



Cooling

- Keeps food fresh between O°C to 10°C.
- Prevent the growth and activity of most of the microorganisms that cause food spoilage.
- Decreases the enzyme activity that causes changes in the colour, flavour, and texture of the food.
- Food requiring refrigeration includes fish, meats, eggs, milk, fruits, and vegetables.



Irradiation

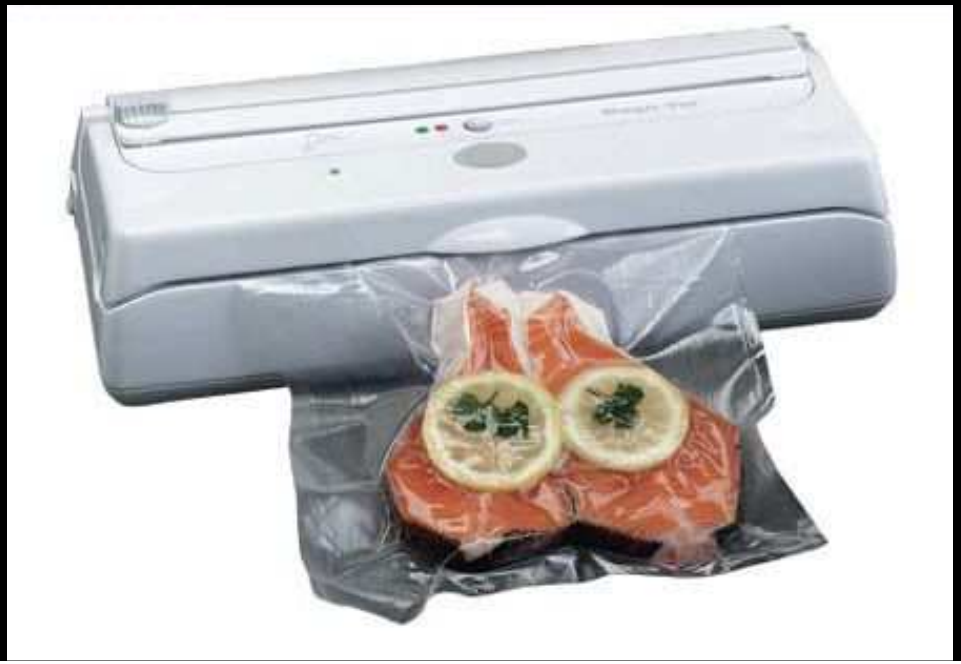
- Treats food with ionising radiation (X-rays, gamma rays, and electron beams).
- Low doses of radiation can kill bacteria and inactivate enzymes with little or no chemical change in foods.
- Also kills insects in foods and stops the sprouting of some vegetables.
- In addition, it eliminates poisonous microorganisms such as *Salmonella* or *Trichinae,* which may cause illnesses.

Canning

- Foods that have been sealed in airtight containers are heated to destroy microorganisms that may cause spoilage.
- Fruits, vegetables, fish , meat, poultry, and soups are examples of foods preserved by canning.

Vacuum packaging

- Food preservation in which air is sucked out from the processed food plastic.
- Examples of food preserved by this method are ground nuts, potato chips and cakes.



WAYS TO IMPROVE FOOD PRODUCTION

- When the population increases, the demand for food will also increase.
- Research is needed to improve the quantity of food production:
  - use of quality breeds and modem technology
  - optimum use of land
  - biotechnology

Biotechnology

- Genetic engineering techniques do allow scientists to insert specific genes into a plant or animal
- Genetically modified foods are foods that have been altered to produce desirable qualities, such as:
  - resistance to pests or inclement weather increase food production, the nutritional content of food as well as to improve the taste, texture or colour of the food.

THE CONTRIBUTION OF TECHNOLOGY IN FOOD PRODUCTION FOR THE BETTERMENT OF LIFE

- The R&D activities have helped increase both the quantity and quality of food production.
  - Improved crop-growing methods,
  - Advances in livestock breeding,
  - The invention of new equipment
  - The development of new food production methods.

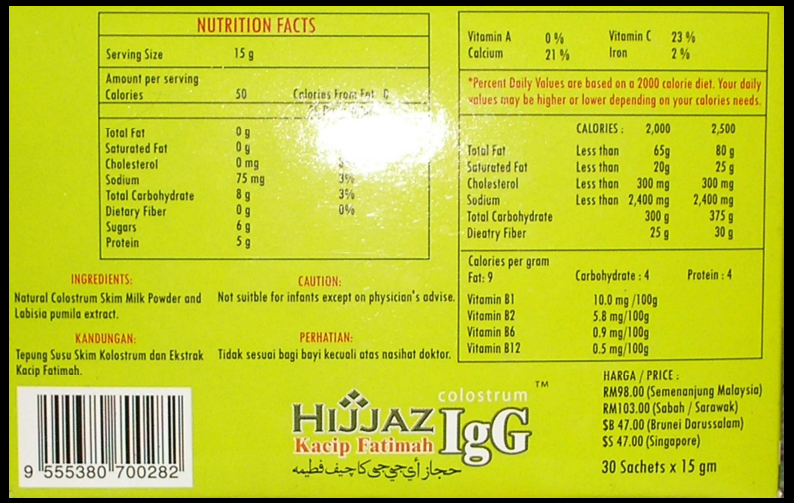
Research Center For R&D

- Conduct scientific investigations to solve problems and suggest improvements in the food and agriculture industry.
  - MARDI
  - MPOB
  - FAMA
  - Universiti Putra Malaysia (UPM)

- The largest increase in food demand has occurred in the non-industrial or developing countries.
- The rapid population growth in these countries has been chiefly responsible for the increase.
- The developing countries therefore must expand their food production greatly or face a severe food shortage.

PRACTISING CRITICAL AND ANALYTICAL THINKING WHEN SELECTING PROCESSED FOOD

- **Food Act 1983** protects people from any adulteration, misdeclaration or breach of prescribed food safety and quality standards.
- The **Food Regulations 1985** that requires food manufacturers to display all the contents of the food on the label of the processed food
- Information on every label of the processed food:
  - chemicals present in the food, expiry date and the ingredients.



CAP (Consumers' Association of Penang)

- Educating consumers.
- Provides consumers with useful information about food products through its periodic publications.
- Protect consumers from food hazards as many human illnesses are food-related.