

CANNING

- an Introduction

Canning - Definition



- Packaging of perishable foods in hermetically sealed containers that are to be stored at ambient temperatures for extended times (months or years)
- A method of preservation of foods by the application of heat in a hermetically sealed container

Canning – Fundamental Principle

Application of heat to foods in hermetically sealed containers for a period of time sufficient to destroy or render inactive any microorganisms that cause spoilage

Canning operation - Objective

Production of commercially sterile food

Commercially sterile

The food is not free of microorganisms but contain viable microorganisms that is of public health risk or multiply under normal storage conditions and lead to spoilage

How to produce commercially sterile food ?

- Sufficient heat must be applied
- Container must prevent recontamination
- Filled and sealed container must be handled in a manner to prevent loss of integrity

Nicolas Appert

Father of Canning

(1749-1841)



- French confectioner
- Won 12000 francs in **1809** from Napoleon I
- First cookbook – *Art of preserving animal and vegetable substances*
- **Appertisation** – Boiling food in glass containers (100°C)
– destroy some flavour
- **Pasteurization** – Cooking food at 70 °C



Peter Durand (1810)

Inventor of Tin canister

Cylindrical canister made of iron coated with tin

1818 - Tin canister-Hole in top can

1820 - Adoption of tin plate container

1823 - Sanitary can with soldered end



Historical developments in Food Canning

1795	French Govt. - Fighting force -12000 francs
1809	Nicolas Appert, French Confectioner Heat food in sealed container (glass)
1810	Peter Durand - Metal container - Patent
1818	Peter Durand – Tin canister-Hole in top can
1820	Adoption of tin plate container
1823	Peter Durand – Sanitary can with soldered end
1837	Hogarth – Steam under pressure (132-138°C)
1839	Fastier – Water/steam under pressure

John Hall and Bryan Dorkin

First commercial canning factory in England

1846



1841	Stephen Goldner and John Wertheimer – Boiling water with salts (NaNO_3 or CaCl_2) – 270-280°C
1851	Chevalier Appert - Autoclave
1861	Isacc Salmon – Used CaCl_2 –240°C
1872	Canning Trade Association - Baltimore
1874	Andrew K. Shriver – Pressure retort
1890	National Cannery Association - Washington
1890-93	Max Ams – Open top sanitary can
1895	Andrew Russel – Spoilage of can Prescott and Underwood – Microbial spoilage
1906	Adoption of Pure Food Act

1910	Collapsed can
1920	W.D. Bigelow – First Director of NCA – Thermal Process based on heat penetration
1923	Charles OlinBall – Theoretical methods for thermal process determination
1927	Alfred Appleyard and Fred Hist – Can body maker
1956	Gill Espy – Spoilage by can seam leakage rather than under sterilization
1962	Gill Espy – Principles of heat sterilization

History of Fish Canning

1817	Lobster and fruit – Boston – Glass - William Underwood
1819	Lobster – New York – Ezra Daggert and Thomas Kensett
1822	Meat - John Moir - Aberdeen John Hall and Bryan Donkin – Britain
1839	Oysters- Baltimore - Edward Bright
1849	Salmon – Ireland – Crosse and Blackwell
1864	Lobster/Salmon – Canada – Hume and Hap good
1866	Turtle - Florida

1867	Shrimps – Gulf of Mexico - Dunbar's
1870	Sardines – Portugal, Spain and Morocco
1872	Menhaden – Long Island
1876	Sardines – Maine - Julius Wolff and Hermann Rensing
1879	Smoking before canning - Norway
1906	Salmon - Siberia
1917	Tuna - California

Main canned fishery products

US	Main	Tuna, sardine, salmon
	Secondary	Shrimps, mackerel, oyster
UK	Main	Sardines, brislings
	Secondary	Tuna, herring, mackerel
India	Main	Sardines, shrimps
	Secondary	Tuna, crab

Indian Fish Canning Industry

1911 – Chaliyam, Kerala – 15 years – Sardines

Failure of canning industry due to

- Non-availability of cheap containers
- Poor and interrupted supply of raw material
- High processing cost
- Inability to compete with international market

Indian Fish Canning Industry..

1950's – Revived

1959 – Canned sardines export

1973 – Maximum export – 2200 tonnes

1984 – Canned tuna export

1990 – Canned shrimps

Tamilnadu

1980s – Canned sardines – TN Govt.

2000 – Canned crabmeat