

Popular Article

Advancements in technology in Indian food industry

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Introduction

Food processing is the transformation of raw ingredients into food, or of food into other forms. Food processing typically takes clean, harvested crops or butchered animal products and uses these to produce attractive, marketable and often long shelf-life food products. Major food processing segments with high growth potential includes dairy, poultry, ready to eat and bakery foods. The processed food industry is divided into the following broad segments:

- Primary processed food e.g. Fruits and vegetables, packed milk, unbranded edible oil, milled rice, flour, tea, coffee, pulses, spices, and salt, sold in packed or non-packed forms.
- Value-added processed food e.g. processed fruits and vegetables, juices, jams, pickles, squashes, processed dairy products (ghee, paneer, cheese, and butter), processed poultry, and processed marine products, confectionary, chocolates, and alcoholic beverages.

Overview of Indian food processing industry

Indian food processing industry is growing at a healthy rate, and two sectors which are driving the growth are dairy sector and horticulture sector. There are several modern technologies used in the food sector according to different operational activities. They are listed below:

Operation/activity	Conventional technology	Modern/Improved technology
Threshing	Manual beating and animal/tractor	Mechanical threshing with improved
	treading	design of threshers
Winnowing	Manually with ordinary baskets	Mechanical winnowing with manual
		mechanical power.



Cleaning	Manually operated SUPA, a simple	Manual/power operated cleaner
	device but of low capacity	cum-graders.
Drying	Open yard sun drying	Solar dryers or heated air dryers
		using mechanical power.
Storage	Earthen pitchers, mud bins or bag	Metal bins, brick structures and
	storage	concrete silos of improved designs.
Milling	Hand and foot pounding, rice	Modern rice, dal and flourmills of
	hullers, stone grinders, oil ghanis,	different capacities, oil expellers,
	etc	solvent extraction plants.
Byproduct utilization	Direct feed and fuel use	Solvent extraction of rice bran and
		oil cakes, pelleted animal feed, etc.
Marketing	Selling raw materials to middlemen	Selling of cleaned and graded
	of trade at low prices	produces, value added products
		directly to super/cooperative markets
		for better profitability.
Preparation and utilization	Open vessel cooking and traditional	Pressure and microwave cooking.
	food preparations	Nutritionally balanced diet/recipes.
		Use of refrigerators,
		grinders/mixtures.

There are other various developed technologies in Indian food industry. They are:

- 1. Ultra-high temperature (UHT) processing and aseptic packaging
- 2. Super-heated water spray sterilizer
- 3. Membrane processing
- 4. Vacuum cooling technology
- 5. Hydrostatic pressure technology
- 6. New technologies in Horticulture (i) Thermal processing methods

(ii) Drying/Dehydration

(iii) Chemical preservation

1. Ultra-high temperature (UHT) processing and aseptic packaging:

It is the most important innovation for dairy products in the last half-century, it involves producing shelf-stable products by sterilizing the product and the packaging material or container separately and filling in a sterile environment



2. Super-heated water spray sterilizer:

Early methods for sterilizing milk involved filling milk into heat resistant glass bottles, then sealing them with air tight, pressure resistant caps and heating in a commercial pressure cooker (or retort) to temperatures between 115°C and 122.7°C for between 12 and 20 minutes.

3. Membrane processing:

Recently, membrane processing has gained importance over conventional processes in Dairy industry for its advantages that are well known and established. Membrane processing has presented new possibilities for the production of newer intermediate dairy products that can be used in different foods based on their functional properties.

4. Vacuum cooling technology:

The vacuum cooling technology allows processors to enhance the shelf life of perishables without disturbing the physical form of produce. The overwhelming response from the industry will make this technique common among food processors in the near future.

5. Hydrostatic pressure technology:

It is the technological innovation offering preservation coupled with other basic processing steps such as drying and permeabilising plant membranes. This processing technology is safe, gentle and hygienic.

6. New technologies in Horticulture:

Another very important component of food processing industry is Horticulture. Horticulture sector includes fruits, vegetables, root and tuber crops, spices, mushrooms, honey, floriculture, medicinal and aromatic plants and nuts. Some of the new technologies which are used in horticulture sector are:

- i. **Thermal processing methods:** In this method the severity of the heat treatment and the resulting extension of the shelf life are determined mostly by the pH of the food. In low acid foods its mainly high temperature processing, and in acidic and highly acidic food its boiling water processing. Some of the thermal processing methods are Blanching, Pasteurization, Sterilization and Commercial Sterilization.
- ii. Drying/Dehydration: Preservation of foods by drying is perhaps the oldest method known. Drying of foods and biological products is a widely applied process for different purposes such as increasing shelf life, reducing packaging costs, lower shipping wastes, encapsulating flavors, making food available during off- season, adding value by changing the phase structure of the native material and maintaining nutritional value. In earlier times drying was only done by



solar, i.e. sun drying. With the invention of new technologies many more have come, they are Mechanical (Cabinet) dehydration, Osmotic dehydration, Freeze drying, Ionizing radiations.

iii. Chemical preservation: In this technique, chemical additives such as sugars, salt, acids, spices etc are used to preserve food. Some of the common ways are High sugar preservation, use of salt/acid/spices, and use of chemical additives.

Conclusion

Food processing is one of the most evolving sectors in India. It is slowly and steadily becoming one of the major industries of our economy. Livestock is an important food source and have vast opportunities in the food processing industry. Food processing in India is witnessing the exponential curve and new trends and developments in the sector can be bucketed.

