



SPECIAL FEATURE

Food & Beverage News February 16-29, 2020 15

Frozen veggies & snacks contribute 85% to frozen market

Dr Khan Chand and
Arshi Siddiqui

Introduction

Today, frozen food is increasingly becoming popular among consumers in India. Freezing technology is the most important aspect for frozen foods. It keeps the food fresh and nutritious from the time it is prepared up to the time it is consumed. Frozen food industry in India has been growing rapidly over the past few years. The busy lifestyles of consumers led to the increasing demand for convenience foods, especially, frozen foods. Previously, the frozen food industry in India was limited to only basic frozen vegetables and French fries. But today, the frozen foods market consists of frozen fruits and vegetables, frozen vegetable snacks and frozen meat products.

The convenience food and ready-to-eat products are estimated to account for the largest share in the frozen food market in India. Frozen vegetables and frozen snacks contribute to 85% of the market share for the frozen foods market in India. The product offerings include cold cuts, meatballs, hot dogs and sausages, samosas, kebabs, nuggets and frozen fries.

In 2018, the Indian frozen foods market reached a value of around Rs 74 billion. The market is further projected to

reach a value of Rs 188 billion by 2024, expanding at a CAGR of around 17% during 2019-2024. McCain Foods, Venky's, Mother Dairy, Godrej Tyson Ltd, Hyfun Foods, AlKabeer Group and Innovative Foods (Sumeru) are some of the key players in the Indian frozen foods market.

Frozen fruits and vegetables

Frozen fruits and vegetables offer a number of advantages over the fresh produce. In India, frozen fruits and vegetables are rapidly gaining traction among consumers. The freezing technique employed in fruits and vegetables assists in retaining the colour, flavour and nutritive value of these products. The residual moisture is converted into ice by freezing, which prevents the growth of bacteria and hence slows down the decomposition.

The spoilage of fruits and vegetables during transportation and exposure to light, heat and dust is also reduced by employing freezing technology. Frozen fruits and vegetables offer numerous benefits which include low cost, easy preparation and availability during the off-season.

Frozen meat and meat products

India has the world's largest population of livestock. Approximately, 5.3 million MT of meat is produced by the country. India is also the largest producer of buffalo meat and second-largest pro-

ducer of goat meat. The meat products are more prone to deteriorate when not stored in proper conditions. Hence, there is a need for cold storage infrastructure which will provide clean, safe and hygienic meat and meat products to the consumers.

Frozen processed meat is expected to show strong growth in the upcoming times. The frozen meat industry is expected to witness the fastest growth in coming years due to the increase in demand for a quick meal that also scores well on the nutrition scale.

Frozen snacks

The frozen snacking market has registered a double-digit growth in India. Nowadays, there is an increasing penetration of frozen snacks, from the deep-freeze displays at retail marts into home refrigerators in India. Both vegetarian and non-vegetarian alternatives are available in the market.

At present, the brands such as McCain, Yummiez, Quick Treat and Venky's offer cold cuts, meatballs, hot dogs and sausages, samosas, kebabs, jalapeno and cheese sticks, spring rolls, nuggets, French fries, fillets, breaded fingers, patties and cutlets, which are available in vegetarian, chicken and mutton variants. The consumer preference for frozen snacks items is rising due to the hygiene issues and easy availability.

Indian Frozen Foods

Market Insights

- The rising disposable incomes have driven the growth of the market. Moreover, the working population of India prefers frozen foods as these are more convenient. These do not need any additional preparation and culinary expertise.
- Changing lifestyle, rising awareness and acceptance, change in consumption patterns have resulted in higher demand for frozen food.
- Another reason for the increasing demand for frozen foods in India is the year-round availability of these products regardless of the season.
- The huge growth of the organised retail sectors in India, these modern grocery and food stores are equipped with cold chain facilities which have led to the availability of a variety of frozen food products in the market.
- In order to expand their consumer base, manufacturers continuously supply the variety of new products, such as frozen fruits, frozen vegetables, frozen snacks, frozen poultry, meat and seafood products and frozen ready-to-eat meals.
- Quick Service Restaurants (QSR), fast food chains, hotels, and cafes serve frozen foods to their customers.
- The booming e-com-

merce sector in India has further propelled the growth of the market. Online platforms offer high product visibility and product listing at nominal costs and hence facilitate the greater market penetration of frozen food products in India.

Major challenges faced by Indian industry

- Due to infrastructure, especially in semi-urban and rural areas, the penetration in the Indian frozen foods market has been limited.
- In India, there are a lot of misconceptions around frozen food and the process. The perception of consumers regarding frozen foods has not been very favourable. The consumption of frozen food is still close to negligible.
- Lack of consumer awareness about frozen foods.

Future scope

Frozen fries and other ready-to-eat food products are gaining acceptance in Indian market. There is a need for better quality, healthier options, and longer shelf life within this category.

(Chand is Assistant Professor and Siddiqui is M Tech student, Department of Post Harvest Process and Food Engineering. They can be contacted at kcpbjpf@gmail.com)

Indian frozen food industry in a different dimension

Amol Chidrawar

INDIAN frozen food market has entered in to a different dimension and now it is not limited to peas and fries but has reached such extent possible that one asks anything, the options are available. Now one can find almost every consumable in frozen category in one's neighbouring modern retail stores. This all has changed in the last one decade. Earlier Indian frozen industry was meant only for the export of green peas and some other categories. Ten years back, only French fries used to be manufactured in frozen food after regular vegetables like peas and corn.

There are major reasons for change in the dynamics of frozen industry in India. These include growing working family, rising consumer awareness towards its con-

venience, growing modern retail, emerging e-commerce, spreading network of quick service restaurant industry and introducing innovative product range.

As per recent reports, Indian frozen food industry has grown to Rs 74.00 billion in 2018 and is expected to reach Rs 188.00 billion by year 2024. However, apart from export, around 26% of frozen food is being sold in retail market. As per industry sources, the modern retail market would be of \$1.10 trillion and e-commerce could reach \$120.00 billion by year 2020. The way modern retail and e-commerce will grow, the frozen food industry will also grow with the numbers.

Major role in sectoral development

Cold chain subsidy of MoFPI has played major role be-

hind growth of sector in the last five years. Because, making project viable through self-finance would have been quite difficult for the cold chain industry. Also, growing frozen transport and availability of storage facility at close vicinity of consumption centre has played major role in sectoral development.

MoFPI has sanctioned around 292 integrated cold chain projects as on date in India. Each project has average cost of Rs 20 crore. Also, each project is equipped with processing, storage, forward linkage and backward linkage facility. All the projects are geographically distributed logically, therefore after some average distance, the facility is available either for processing or for storage or for transport.

As frozen foods are highly convenient for preparation therefore modern work style,

working families, adoption of Western culture makes suitable to attract attention of consumer towards adopting frozen food.

Though, frozen food has become popular in the country but it is used only occasionally. But in a very short period of time, the industry will sharply grow due to unseasonal demand, scarcity, growing number of Indians as foreigners and increasing food safety concerns by consumers.

The frozen food market is growing day by day, the way modern retail market is growing as modern retail markets have facility of cold chain infrastructure as well as in store facility right from processing till it receipts by consumer. The in-house supply chain by modern retail is making win-win model for processor as well. The processor does not

have to develop last mile cold chain infra, which helps him to balance companies' financials.

Technologies available in processing

There are nine main types of different freezers and most of them have more than one naming:

- The air blast freezers / cold storage freezers
- The carton freezers / box freezers
- The spiral belt freezers
- The fluidised bed freezer / IQF freezer (or tunnel freezers)
- The immersion freezers / brine freezers
- The plate freezers / block freezers
- The contact belt freezers
- The impingement freezers / flat product freezers
- The cryogenic freezers

CONTINUED ON p16▶



Spiral belt freezer is good solution for gentle products - pizza, ice cream cup

CONTINUED FROM p15 ▶
Blast, Spiral and IQF

Out of the total nine processing technologies are available under preservation of food by freezing method. In India, only three methods are being used in major. i.e. Blast, Spiral and IQF. The blast frozen is generally used in liquid material as the same is frozen at shock of -40°C for stipulated time period, where temperature reaches at its core point.

On the other hand, the Spiral belt freezer is a good solution for gentle products viz. pizza, ice cream cup and so on as it minimises product damage at transfer points. Third and major processing technology is IQF (Individual Quick Frozen). The most efficient and trusted method in frozen food industry in India and abroad.

Fluidised or IQF freezer is based on a belt or a perforated bed on which the product is fluidised with strong vertical airflow, passing from beneath

the bed/belt. This is the most complex freezing technology as the product is not statically frozen thus multiple variables such as shape of the product, aerodynamics, ripeness, firm-

ness or water content of the product will all influence the freezing result. Around 90% of Indian frozen food industry uses IQF technology.

Some of the major players operating in India frozen food market are McCain Foods India Pvt. Ltd, Punjab Agro, Godrej Tyson Foods Limited, Venky's India Pvt. Ltd, Darshan Foods Pvt. Ltd, Mother Dairy Fruit & Vegetable Pvt. Ltd, Amul, Vadilal, Innovative Foods Ltd, Al Kabeer Exports Pvt. Ltd, Haldiram's Snacks Pvt. Ltd, MTR Foods Pvt. Ltd, and ITC Ltd, among

others, for Star Frozen Foods and so on. The above discussed companies are mainly involved in the manufacturing of below categories of frozen food

contributed by poultry meat, with an average production growth of 7.8%. However, out of the total available meat in India only 235 of meat is being processed. So, there is enough scope for the industry for frozen meat processing.

Installed processing capacity
 Seafood processing industry is also doing well in the sector. Currently India has dedicated installed processing capacity towards fish processing – 33,000 MT divided in 606 (EU and Non-EU) processing units spread across the production

manufacturing Frozen Fruits & Vegetables; Frozen Meat & Poultry; Seafood; Frozen Snacks and RTE; Dairy. The estimated production of year 2018-19 for fruit 96.75 million tonne and vegetable -187.47 million tonne, which indicates that the backward linkage could be very strong. Only a strong forward linkage will lead the industry to very next level as we are still on the edge of only 2% of processing against total production of fruits and vegetables.

On the other hand, India is not behind in producing meat

centres in India. Where the total production of fisheries recorded in 2017 is 11.09 million tonne. The only bounding of particular sector is stringent norms of export laid down by MPEDA. Also, there is dedicated cold storage capacity of 4.60 Lakh MT in the nearby area of production centre.

The snacks and RTE industry is growing in domestic market very well along with international market

The snacks and RTE industry is growing in domestic market very well along with international market. The authenticated sectoral data is not available at this moment. But presence of product in retail store and awareness among the consumer indicates that, the sector is growing well in it. As per the above discussion and figures, we can understand the opportunity available in the sector and the growth in near future.

The snacks and RTE industry is growing in domestic market very well along with international market. The authenticated sectoral data is not available at this moment. But presence of product in retail store and awareness among the consumer indicates that, the sector is growing well in it. As per the above discussion and figures, we can understand the opportunity available in the sector and the growth in near future.

The snacks and RTE industry is growing in domestic market very well along with international market. The authenticated sectoral data is not available at this moment. But presence of product in retail store and awareness among the consumer indicates that, the sector is growing well in it. As per the above discussion and figures, we can understand the opportunity available in the sector and the growth in near future.

(The author is deputy VP at ITCOT Consultancy and Services Ltd, Mumbai. He can be contacted at cbidrawaramoh@gmail.com)

GreenChill is a programme that promotes an industry transition

CONTINUED FROM p12 ▶

The equipments used are Blast freezers - Air blast freezers take 75-90 minutes to freeze food. The cold air blown is between (-32 degrees) and (-40 degrees) Celsius and Cryogenic blast freezers are the fastest – in 90 minutes food must be frozen to below (-5 degrees).

Both cooked chilled and cooked freeze have high capital cost. The energy cost for cook chilled are lower than cook freeze. Cook chill is less flexible and has a limited storage time and a much smaller margin of safety. Fluctuations in storage temperature have serious effect on both quality and safety in cook – chill than in cook-freeze.

Certain responsible stakeholders have identified a pressing need in developing countries to connect local farmers with higher-value market options locally, nationally and internationally through cold chains. The challenge for the engineering profession is to do that in a way which minimises food wastage, is sustainable and avoids harmful emissions and air pollutants.

In other words, we need to help establish sustainable and resilient infrastructure, fit for purpose in the local context from the beginning. There are

two elements that are important; firstly, projects need to be affordable; secondly they must be safe, reliable, easy to build, operate and maintain.

Green Freeze and Green Chill System

Most people have heard about the environmental damage caused by refrigerants used for cooling refrigerating purposes - CFCs chloro fluorocarbons, which were phased out of use and replaced from (HCFC, usually HCFC-22) to then to (HFCs) are greenhouse gases, which do not deplete the ozone layer and are up to 11,000 times more potent than CO2.

An exciting development in the industry is a programme developed by Greenpeace called GreenFreeze, which developed refrigerated bottle display cases and vending units that use carbon dioxide (CO2) as a refrigerant rather than HFCs. Under pressure from Greenpeace, Coca-Cola installed the new CO2 coolers at the Beijing Olympics in 2008 and plans to continue manufacturing the units after the Olympics.

GreenChill is a programme that promotes an industry transition to non-ozone-depleting refrigerants, reduction of refrigerant charges and reduction of both ozone depleting and greenhouse gas

refrigerant emissions through promoting supermarkets' to adoption advanced refrigeration technologies.

In the Cold Chain IQ article "Cutting Waste in the Cold Chain," Geraint Thomas, technical director at Laminar Medica, wrote: "The suppliers and users of temperature-controlled packaging systems are under increasing pressure to reduce the environmental impact of cold chain shipping. The widespread introduction of formal corporate social responsibility policies, together with new customer expectations and more strict regulations, mean that developing a suitable packaging system is more challenging than ever."

Studies have shown by locating a cryogenic energy storage facility at an agricultural 'hub' in a rural location, effectively establishing a local 'tank of cold', sustainable power and cooling can be provided to drive all three cold chain steps. Additionally, this tank of cold could help improve a broad range of local services essential to an agricultural community. These include community electricity through micro-grid application, small-scale fertiliser production, refrigeration for vaccine storage and distribution, and cooling for value-added food process-

ing. It also shows how existing cryogenic infrastructure in more industrialised developing economies can be utilised to begin the process of building a sustainable cold chain.

Recommendations

Companies that succeed in making their operations more environmentally friendly can expect operational cost savings as a result of less waste, reduced fuel, energy and transport costs, and a lack of compliance penalties.

Cold chains are an essential component in establishing an efficient food supply chain, but the current deployment model is unsustainable in the developing world where in many cases energy security is completely absent.

Governments of newly emerging and rapidly industrialising economies must prioritise support investment in cold chain infrastructure to improve food security, underpin development and help alleviate poverty.

Donor country governments and development NGOs must support and incentivise aid recipients to develop sustainable cold chains using renewable energy and waste cold.

Minimise carbon - By understanding the lifecycle of a product from raw materials to disposal, companies can

identify areas where there is real scope for improvements and redesign aspects of the process to minimise their environmental footprint.

Research has shown that automating supply chain transactions can have a significant impact on a firm's carbon footprint, as well as the well-publicised cost benefits.

Identifying the financial benefits of any green supply initiatives and clearly demonstrating them to the relevant decision-makers of the company is essential.

The main concept in a cold chain is to have a minimum time span between pre-cooling, chilling and/or freezing produce and the point of harvest, to retain nutrients and increase the shelf life. There have been developments in cold storage and refrigerated transport that continue the preservation process, boosting food safety and maintaining quality. The challenge is that in nearly all cases they rely on access to a reliable and affordable source of either electricity or diesel fuel, which are often lacking or virtually non-existent in developing countries, particularly in rural areas where energy security is a significant issue.

(The author is lecturer at IHM Ahmedabad. He can be contacted at sallavijaykumar75@gmail.com)