



Indian Food Packer

Bi-Monthly Magazine

May-June, 2020

Covid 19

**Stimulus package
to revive food
industry**



All India Food Processors' Association

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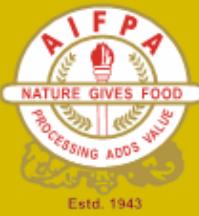
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All India Food Processors' Association

Rejigging Food Processing Industry



Dear readers,

Greetings from Indian Food Packer!

We welcome you to the new edition of Indian Food Packers. The ongoing health crisis has brought an apocalyptic change in every business. The change is universal and not limited to a country or a region. The food processing industry has witnessed maximum disruption. During the current crisis the food supply chain was completely disturbed and we are expecting the tremors to continue for a while now.

Currently, the food processing industry in India accounts for 32% of India's food market and 11.6% share of employment in the domestic food industry. The food processing market in the country was valued at Rs 25,691.30 billion in the Financial Year (FY) 2018 and is expected to reach Rs 53,435.52 billion by FY 2024, expanding at a CAGR of 12.9% during the FY 2020-2024 period.

The food and beverage industry was growing at 13.41 % during the 2015-2019 periods, thereby providing a conducive growth environment and abundant scope of generating employment opportunities in the country.

However, the global Covid-19 pandemic has changed the contours of India's food processing and beverage industry. The nationwide lockdown has forced virtual closure of the factories and processing plants. The industry is operating with bare minimum staff and labour, hardly 30-40% of full capacity. Limited mobility, within states and inter-states, has impacted the smooth delivery of raw materials and finished products from

one location to another location. Above all, the liquidity crunch has seriously hindered day to day functioning of the factories and plants.

We have enormous challenges before us. We have to divide the pandemic period in two parts- Covid19-period and post-Covid19 period. Covid19-period implies immediate attention. We have to address the issues at hand like resuming operation of plants with all safety measures in place, allowing workers to join in the work and procuring the perishable fruits and vegetables from farmers and preserve these commodities for using all year round. Post-Covid19 period needs a long term approach like policy intervention, providing loans to the food processing units at lower interest rate, and investment in building infrastructure (cold chains, well established distribution system and transportation system) etc.

Although the unorganized sector dominates the industry, the organised sector is expected to develop during the forecast period (FY 2020-21 to 2023-24). Further, doubling the income of farmers by 2020, as announced by the Government of India, can only be achieved with the growth of the food processing market in India.

Furthermore, more than 60 % people in the country depend on agriculture and food processing. As per the second advance estimates for 2019-20, India's food grain production is estimated at record 291.95 million tonnes. Notwithstanding a large production base, the level of processing is as low as below 10 %. Thus, the pandemic gives an opportunity to help rejig the food processing industry and encourage more investment.

Pravash Pradhan
Chief Editor

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A note of gratitude to Smt Harsimrat Kaur Badal Honble Minister of Food Processing Industries



All India Food Processors' Association (AIFPA) has underlined the initiatives taken by Union Minister of Food Processing Industries, Smt Harsimrat Kaur Badal for the food processing industry during the Covid 19 pandemic.

The association has expressed its happiness over the deliberations it had with the Union Minister and department officials during the lockdown period. The measures taken by the government during the crisis period will help the food processing industry to a great extent, said, the Association in a statement.

The world was reeling under the severity of the pandemic, normal life was disrupted, industries were shut, economy seemed to cast a long shadow and uncertainty loomed large everywhere. However, there was one major challenge, the challenge of sustaining the food supply chain, which was very important for the survival of the

people in the country. Smt. Harsimrat Kaur Badal took the lead to motivate and operationalise the food industry. She was the torch bearer once again.

The Union Minister and her team of officers worked hard from their residences, interacted with stakeholders through video conferences, coordinated meticulously with the state Chief Ministers and resolved day to day problems faced by the industry. Smt Kaur also listened to all suggestions made by the Association very carefully and made well studied recommendations to the Prime Minister, Home Minister and Finance Minister for the benefit of the food industry.

The Association in a statement said, "Smt. Harsimrat Kaur Badal worked closely at higher policy making levels to move important issues and build consensus- matters relating to financial support, amendments in Essential Commodities Act and APMC Act, Rupees Ten Thousand Crore support for Micro Food Processing Enterprises, allocation of Rupees Three Lakh Crore for different schemes, reworking the definition of MSME Sector for boosting the growth of India's vast micro, small and medium scale industry, incentives for development of Dairy sector, requesting State Government to exempt the Food Industry & Cold Storages from Fixed Electricity Charges and many other ideas to integrate post-harvest handling at the farm gate and saving the perishable agri-produce,"

It is an old saying that, 'When crisis knocks hard, the fearless lead'. Hon'ble Minister, Smt. Harsimrat Kaur Badal portrayed this ability during the current crisis created by Covid-19. Food processing industry is extremely grateful to her for the various initiatives taken to save this fragile sector from the severity of the crisis. New ideas have been generated through current deliberations to enhance the level of food processing and make the system more remunerative for farmers. It is envisaged that with these measures India will emerge successful from the current crisis and play a major global role in the future. The industry stands committed to fulfill these goals.



Covid 19

Stimulus package to revive food industry

Dr Subodh Jindal

President, AIFPA

LEAD STORY

Introduction

The Covid-19 pandemic and the nationwide lockdown has severely crippled the Food Processing industry. The industry witnessed complete shut down during the first two to three weeks of lockdown, starting from 23rd March 2020.

The industry which was growing at the average rate of 13.40% during 2015-19 period has virtually come to a standstill. Though the government noticed urgency of resuming agricultural and food processing activities, yet paucity of workers and lack of transportation limited the operation of processing plants. Even after 40 to 45 days of the lockdown, majority of factories and plants were working with 30-40% of their employee strength.

Thus, it is paramount that the processing industry, most of them are small and medium enterprises, need government support to become fully operational. Two broad areas need to be looked into immediately. First, save the perishable crops at hand to feed consumers and second, maintain the supply chain of essential items during the crisis period to avoid panic among consumers.

The All India Food Processors' Association (AIFPA) has actively engaged industry members and the government to find a solution to the present imbroglio.

Worried about the lives of farmers, lakhs of processors, particularly the Micro, Small and Medium Enterprises who feed our 135 crore population and employ crores of workers, AIFPA

has submitted following suggestions with the Ministry of Food Processing Industries to the revival of the food industry.

Industry Concerns

A. Loss of Perishable Crops:

AIFPA has repeatedly emphasized on the urgent steps required to save perishable crops at hand. The Government has made adequate arrangements for grains. But no steps have been taken for saving Fruit Crops (like mango, tomato, pineapple, papaya, guava, litchi, cherry, pear, banana, sapota, pomegranate, peach, grape, strawberry etc.) These crops are extremely important for their economic dividends to the nation, be it farm sustenance, employment, exports and consumer products all year round.

The losses include:

- a. Valuable Fruits worth lakhs of crores will be wasted.
- b. This will bring unbearable loss and suffering to farmers.
- c. Processing industry will lose a year of work as basic fruit material will not be available.

- d. Consumers will suffer, as many of their healthy daily use food products will not be available.
- e. Crores of production workers and supply chain manpower will lose jobs and become a liability.
- f. Exports will not be possible and buyers may find other sources, damaging next year business also.
- g. The entire allied activity chain of packaging materials, ingredients, additives, equipment services, processing aids, transporters, distributors, warehousing units, technology providers etc. will suffer.

B. Working Capital Loan:

In the deliberations held last month, suggestions were made for financial support to enable the industry to procure the crops, raw materials and operate to save the perishables.

C. Work Permissions:

In many places work permissions were granted to units, though with limited number of workers, but local authorities in some areas cancelled the permissions. This has upset the industry.



D. Workers Movement:

Despite Government's instructions, district authorities have restricted movement of workers in many areas. It is very difficult, not to mention inter-state and intra-state travel, to make movement within the district. Also, there are instances of rough treatment meted out to workers by the police.

E. Workers' Sentiments:

It is also reported that workers feel assured of getting their salary as declared by the Hon'ble Prime Minister and therefore, do not want to come to work and risk their lives. They also feel that there is no medical package for them and the normal ESI facilities will not be sufficient to treat them in case the epidemic spreads.

F. Employees' Wages / Salary:

At most places, units have paid wages / salary for the month of March. But a large section of the industry is not able to pay the wages / salary for the month of April. Incoming payments of the industry are held up and further supplies are expected to take time.

Government support of 'Wages / Salary Package' was recommended but no action is taken yet. Payments of ESI, PF are also difficult in this position. Ministry of Labour and Employment is still pressing the industry to make full payment of wages / salary.

Some States have issued directives of severe action for non-payment of wages / salary. People

are seeking legal advice and approaching courts for relief.

Industry is also apprehensive of the burden of Fixed Costs, Running Establishment Expenses, Property Tax, Fixed Utility Charges, Security and Statutory Compliance etc.

Steps recommended

In order to save the nation from the potential disaster as explained above, some steps have to be taken on a war footing. This may require mobilizing important policy decisions and their implementation.

- a. Issuing instructions to field officers to permit operation of 'Food Processing Units' on priority and for movement of their workers at least within the district (unless it is a Red Zone).
- b. Give permission to units manufacturing packaging materials for food industry to operate (unless it is a Red Zone).
- c. Provide an 'Employees Package' with support for Wages/Salary, ESI, PF and COVID Medical Cover.
- d. Immediate arrangement to provide 'Working Capital Loan' on low interest rate without collateral security for 50% value of current year requirement which may be calculated on the basis of past two years performance. Stocks may be taken as collateral to the extent possible.





This loan should be in addition to any other loan being used presently by the unit. Concerned Banks & Financial Institutions should be mandated to support food industry up to 31.03.2021 on emergency basis as national priority.

It is suggested that Government may issue strict guidelines and targets to banks to provide loans to food industry for this crisis period up to 31.03.2021 in the national interest. Banks may take appropriate legal undertaking for repayment of the loans issued by them.

e. Government instructions for deferment of EMIs has been acted upon only by Nationalized Banks. Other banks have not adopted these guidelines. Moreover, no process has been started for reduction in interest rates on existing loans and OD limits which is very important for the industry to sustain. Interest subvention can also be given and later changed to PLR Rate for up to 31.03.2021.

f. Government may use existing deposits of ESI PF, and other Schemes to fund food Industry up to 31.03.2021.

g. Immediately stop the import of fruit pulps / concentrates so that Indian produce is consumed and not wasted. Otherwise farmers will be severely hurt.

h. GST should be placed at 0% on primary processes such as Pulping, Drying, Salting, Syruping, Freezing, Ambient Controlled / Cold Storing to save fruit crops and store the same

as intermediates for industrial use for a period up to 31.03.2021.

- i. On all other food products GST should be reduced to half its current rate up to 31.03.2021. Alternatively, GST rate may be moved one step lower, such as 28% to 18%, 18% to 12%, 12% to 5%, 5% to 0% up to 31.03.2021 to ease burden on the food industry. This will also help to reduce prices.
- j. Immediately release pending refunds of Income Tax, VAT, GST to enable food industry to cover a part of its lock down losses. Large funds are lying held up with the government. Special instructions should be given to field tax authorities for this purpose. These held up funds are already causing frustration among the industry.
- k. Make payment of accumulated input credit of VAT and GST to help sustain operations of food industry.
- l. Waive Fixed Charges on Electricity, Water, Gas and other utilities for food industry up to 31.03.2021.

Conclusion:

The Food Industry representatives feel that the people engaged in operating food industry should be accorded similar safety and security support as other essential services are provided under the current circumstances. 'Food Warriors' are key and vital in winning the war over COVID.

INDUSTRY VIEW

"We have submitted a 'Status Report' with Smt. Harsimrat Kaur Badal, Hon'ble Minister for Food Processing Industries, Government of India and requested her to kindly take appropriate actions urgently before it is too late to save the perishable fruit crops. The fruit seasons are already at hand and once the same are over, it will be an un-measurable and irretrievable national loss".

Dr.Subodh Jindal
President, All India Food Processors' Association (AIFPA)

"We learn that factories have difficulty in getting permission and have no money to purchase the mango. If the factory people will not purchase our mango, we will starve. This is the only livelihood for us. This area gives 5 lakh tons of mangoes covering Ratnagiri, Sindhudurg, Raigad, Thane and Palghar districts. We appeal to purchase our mango crop or help the mango pulp industry to buy mango and save us from starvation".

Dr Vivek Y Bhide,
Chairman, Konkan Hapus Amba Utpadak And Utpadak Vikrete Sahakari Sanstha Maryadit

"Mango is the official cash crop for our farmers in both Krishnagiri and Dharmapuri districts in Tamil Nadu. It gives direct employment to over 1 Lakh people in our districts. With 1.5 lakh hectares of mango cultivation in these regions, our farmers cultivate 600000 MT of Mango every year which are consumed by the 40 processing factories located in both districts. We request that the Mango Pulp Exporters and Processors be considered with an allocation of Special Fund Package (Apart from existing bank working capital limit) on the basis of their balance sheets of last three years for the procurement of mangoes and to process the fruit into different packaging such as Aseptic, Can, Frozen Mango Pup, IQF Slices within the dedicated time to support farmers and stop fruit wastage".

D. Mathiazhagan,
President, Krishnagiri-Dharmapuri District Fruit and Vegetable Processors Federation, Tamil Nadu

"South Gujarat, one of the districts, hosts premium mango, like Alphonso and Kesar, processing industry in the country, which directly supports farmers from South Gujarat 10.32 lakhs hectares of mango cultivation and also, employe around 15 lakhs of labor and the South Gujarat mango pulp industry by processing around 2.1lakh empty of fruits is the main livelihoods for thousands of farmers, associated labor, business, etc. Cash flow of the whole industry has come to a standstill. Therefore, the mango pulp exporters and processors to be considered with allocation of Special fund Package (Apart from existing bank working capital limit) on the basis of their balance sheets of last three years for the procurement of mangoes and to process the fruit into different packaging such as Aseptic, Can, Frozen Mango Pup, IQF Slices within the dedicated time to support farmers and stop fruit wastage".

Suraj Savaliya,
Secretary, South Gujarat Mango Pulp Processors Association

FSSAI REGULATIONS

Front-Of-Pack and General Labelling delinked



FSSAI, the country's apex food regulatory, has decided to delink the front-of-pack labelling regulations from the general labelling requirements.

"The two subjects will now be looked upon separately by the expert panel of FSSAI," said Sh. Pawan Kumar Agarwal, Chief Executive Officer, FSSAI.

"In the authority meeting, we discussed at length on labelling regulations. Apart from front-of-pack labelling, other issues which are very substantive and, in fact, much larger, were related to other

labelling requirements," he added.

"So the authority has decided that front-of-pack and general labelling regulations should be delinked, and that the two can move at their own pace," Agarwal said.

The front-of-pack labelling requirement is largely related to the declaration of the threshold of salt, sugar and fat and its depiction. FSSAI will look into the subject of thresholds needed to be defined across the food categories.

Agarwal stated that the main issue regarding front-of-pack labelling was about getting thresholds that were relevant to Indian conditions, in place of adopting any other country- or region-specific threshold.

"The threshold should be an India-relevant threshold," he added, stating that a study into the defining threshold was going on, which would provide the threshold limit of the fat, sugar and salt in the food products.

The CEO added, "The front-of-pack labelling has two aspects. One is the threshold, and the other would be how we would depict it on the label, what shall be the symbol/figure and configuration."

"So simultaneously the work will go on, and as soon as we get thresholds, we will take a view on that and notify it," he said.

FSSAI is expecting that the regulations on general labelling will be notified first, followed by the front-of-pack labelling norms. Agarwal said that the FSSAI was open to suggestions on the subject.

GST ISSUE

The Pinching Agri-Product Taxing Regime



Eighteen per cent GST (Goods and Services Tax) on agri-food products will only mar the growth of food processing industry. This was opined by the All India Food Processors' Association (AIFPA). All the processed ready-to-eat foods are at 18 per cent GST. This was learnt at the 75th annual conference, award function and national seminar of the All India Food Processors' Association (AIFPA).

"We are aware that production cost is high, but the government is still charging 18 per cent GST for packaged foods. Moreover, the government does not want to reduce the packaging duty, and it is going to be difficult to process the farmers'

produce, which has resulted in a slowdown in the economy," said Dr Subodh Jindal, President, AIFPA.

At the National Seminar on "Strategies for Boosting the Growth of Food Processing in the Country", experts deliberated on the impact of GST, challenges in food processing and the woes of the farmers.

Present on the occasion was the Hon'ble Minister of State for Food Processing Industries, Sh. Rameswar Teli who said that India was home to 40 food parks, but "not much work was happening, despite the subsidy that was given to the stakeholders," he added.

Going by the slowdown and its impact on the industry, the Hon'ble Minister said that his ministry was open for a dialogue to iron out the issues.

"Considerable pressure was put on the government and the GST Council that if the country was hard pressed for funds, then it could increase levy on all other items, except food," he said.

"There are a slew of issues impacting the food processing sector like silos of decision making, and not relating to the ground realities," said Dr. Prabodh Halde of Merico Ltd.

"The food processing industry has asked the government several times that it should be consulted in these matters. It is high time the government makes special provisions for food processing projects to prevent farmers' penury. For example, supporting opportunities to process tomatoes when there is a glut in the market would go a long way to ensure the farmers' livelihoods," he added.

Sh. Sanjay Singal, Chief Operating Officer, ITC, said, "The adoption of technology would bring in considerable transparency in operations from farm to shelf. There are several technologies for pre-harvest and post-harvest. Technology helps food manufacturers to produce more efficiently and the adoption of software ensures consistent quality."

In his keynote address, Dr Chindi Vasudevappa, Vice-Chancellor, NIFTEM, MoFPI, Government of India, said, "There is a need to promote traditional foods along with the modern processed products."

"These could be in the areas of dairy processed products or novel and nutritional foods. The Make in India culture will prove Indian food manufacturers robustness in the years to come," he added.

SAVING WATER

NGT bans ROs that discard 80% water



The National Green Tribunal (NGT) has ordered to ban RO (Reverse Osmosis) water filters that discard 80% of water in the process of making it 'pure' for drinking. The order further says that RO

companies should be given NOC only for making ROs that can recover 60% water.

The NGT has also lashed out at the Ministry of Environment, Forest and Climate Change for not placing regulations in this regard while hearing a petition on the subject.

NGT was hearing a petition which questioned the permissibility of use of RO system where Total Dissolved Solids (TDS) level is below a particular threshold and where RO system destroys minerals rendering use of RO treated water harmful for human health. Further questions were raised before the NGT about preventing undue wastage of water rejected in the process of filtration through RO system.

The NGT order says, "Based on Expert Committee findings, this Tribunal, vide order dated May 20, 2019, held that where the TDS in the water was

less than 500 mg/l, use of RO be prohibited. Wherever RO is to be permitted, conditions of recovery of water to the extent of more than 60% be required. Further provision should be for enhancement of recovery of water upto 75% in phased manner in future and reuse thereof for permissible purposes. The Tribunal directed the MoEF&CC to issue appropriate notification and file an affidavit of compliance within one month, apart from other directions."

The matter was considered on Sept 23, 2019, and it was observed by the NGT, that the MoEF&CC has still not complied with the same and, instead,

has filed an affidavit seeking eight months for complying with the order.

Accordingly a status report was filed on Oct 31, 2019, on behalf of the MoEF&CC.

During the hearing, the officers present have not shown any valid reason for non-compliance beyond what is mentioned above which stands no merit, the order added.

Meanwhile, the RO Manufacturers Association challenged the NGT order in the Supreme Court, which refused to stay the order and has asked the association to approach the government.

COFFEE AND COLA

PepsiCo to launch its new coffee-infused cola

PepsiCo will launch its new coffee-infused cola concept, Pepsi Café in April for a limited time. The beverage will blend Arabica coffee with Pepsi in 12-ounce cans and come in two flavors: Original and Vanilla. The blended beverage will have twice the amount of caffeine as a regular Pepsi.

This is the second time Pepsi has released a coffee-cola beverage. In 1996, the company released Pepsi Kona in Philadelphia but discontinued the product a year later due to low sales.

Despite its first iteration of coffee and cola failing,

PepsiCo seems to think today's consumers will be more interested in the mixed beverage. That could be a good bet since today's consumers are drinking more coffee and less soda.

This new beverage could check several boxes for consumers. According to a new report by Imbibe, the future of beverages in 2020 is functional. Coffee, with its associations to brain health, anti-inflammatory properties and antioxidants, can fall into this trend and attract consumers looking for additional benefits from their food and beverage. Ready-to-drink options are also the fastest growing segment of the coffee category, growing 31% in the last two years.

As coffee grows, soda's popularity is fizzling out, so fizzy beverage companies are making investments in the space.



CHILL WITH CHILI

Chili peppers can reduce risk of fatal heart attack



A study has found those who eat chili peppers at least four times per week had a 40% lower chance of dying from a heart attack. The research was published in the Journal of the American College of Cardiology.

The researchers said people who often consume chili peppers reduce their mortality risk by 23% for every cause when compared with those who don't eat them. The analysis was done on 22,811 men and women enrolled, and the median follow-up period was 8.2 years.

While chili peppers are traditionally part of the Mediterranean diet, the researchers in this study said epidemiological data associating their consumption with mortality risk have been scarce, especially studies on populations in that region. These new findings help fill that gap, and they also dovetail with similar studies of other groups.

A 2017 study of 16,000 U.S. consumers for up to 23 years found regular consumption of chili peppers lowered mortality risk by 12%. Capsaicin

— the component in chili peppers that can bring on a burning sensation — is believed to have antimicrobial properties and may regulate blood flow and alter gut microbiota, that study found. However, other research on Chinese adults have linked chili pepper consumption with general obesity and faster cognitive decline.

While most of the research seems positive, mixed messages overall could produce more confusion than clarity on the issue. Manufacturers may be wondering whether or not to shy away from producing spicier products by adding chili pepper. Consumers also may be considering whether it's a good idea to buy and eat them, or in what quantity.

In the meantime, spicy flavors are experiencing a resurgence in the marketplace. Spicy foods and flavors have grown in popularity in the U.S. Americans seem to be moving past the nation's love of hot sauce as manufacturers highlight the different flavor notes of chilies and more authentic international flavors in a variety of products.

Chilies are showing up more often in snacks, ice cream and other dairy products. Candy has been spiced up as Snickers added Sichuan peppercorn, and Skittles and Starbursts have also gotten a hot reformulation.

Dairy products also have been adding heat and spicy flavors since the creamy texture and sweetness can help reduce the sensation of heat that capsaicin produces in most pepper varieties.

It's likely more studies will be forthcoming on the health effects of chili peppers. Unless something really alarming comes out from future studies, the popularity of spice in foods and beverages will probably not abate anytime soon. In fact, the global spice market is expected to grow 6% between 2018 and 2023 to \$30.4 billion.



TOP SNACKS

Frito-Lay bring out its top snack trends for 2020

Frito-Lay plans to make spice, citrus, global influence, unexpected combinations and health benefits will be driving snacking trends in 2020. Global influence will be evident in the appearance of more chilies – including ghost, habanero, poblano, hatch and chipotle – as well as the spread of heat tolerance, which the company predicts will go into more mild cuisines like U.K. and Australian food. Also, the types of citrus that make appearances – including yuzu, grapefruit, blood orange and Buddha's hand – indicate more consumer interest in sour snacks.

Better-for-you options and on-the-go availability are also both trends Frito-Lay noted will stick around for Snacking is becoming such a mainstream mode of eating, more people are consuming snack foods between meals and as meal replacements.

In Frito-Lay's latest snack trend list, it expects consumers to be seeking sour and unexpected combinations. Frito-Lay noted that "unexpected" could include flavors like gin or bourbon or multi-layered combinations that combine several trending flavors.

Companies are already tapping into some of these trends, and there could be more of that in the year to come. Frito-Lay recently announced that it would be keeping its new hot and sour snack, Lay's Flamin' Hot Dill Pickle, as a permanent staple.

This evolution of snacking points to more prevalence of savory options. Salty snacks are becoming more popular, and the report's data linked this to the spread of snacking to all parts of the day. More people are also replacing meals with salty snacks, Innova said, with 23% consuming them at lunch, 17% at dinner and 8% at breakfast.

This trend toward better-for-you options has been around for a while, so it isn't surprising to see it popping up again in Frito-Lay's list. Global flavors have also been a peaking trend.

Consumers are likely going to continue to demand authentic flavors to benefit their health as they work to nourish themselves in a world with increasingly hectic schedules. Research from Euromonitor International found reduced unplanned, impulse snack purchases in the last five years. At the same time, the snacking business grew \$3.4 billion globally in 2017, according to Nielsen. That suggests consumers are just as dedicated to what they are putting into their bodies in terms of both health and flavor as they are to convenience. Therefore, manufacturers will need to continue to innovate to keep flavors fresh and healthy to keep consumers coming back for more.



COFFEE IS BACK

Gloria Jean's Coffee is back with 100 new stores



Gloria Jean's Coffee is coming back to India with 100 new stores in the next five years with its new India partner, Jay Jay Capital & Investments. The coffee company plans to invest up to Rs 150 crore for the expansion. The first set of stores is slated to open in Mumbai and Bengaluru by June 2020.

In its first stint in India the Australian coffee brand had entered into a master franchise agreement with Citymax Hospitality of the Landmark Group, but had to shut shop after seven years of operations and a bleeding balance sheet.

Gloria Jean's Coffee will now work on a cold kitchen concept and prepare fresh food. The cafés would be about 800-1,500 sqft with a per-store investment of about Rs 1 crore. It expects the return on investment to start within two-and-a-half years of a store first being set up.

In 2014, it had annual revenue of about Rs 15 crore in India, after seven years of operations. The company was founded by Gloria Jean Kvetko in 1979 in the US, and opened its first outlet in Sydney, Australia. It is present in more than 50 markets.

The café chain market in India, led by Café Coffee Day and Tata Starbucks, is one of the fastest growing categories in the consumer food service industry, estimated to grow 6.9% a year to Rs 4,540 crore by 2023 in value sales at constant

prices exclusive of inflation, according to market research firm Euromonitor.

Jay Jay Capital, a 15-year-old company that provides liaising and permitting services to oil and gas companies for due diligence, land conversion deals, etc., has entered into a master franchise agreement with Gloria Jean's Coffee. The company also provides similar services to Tata Starbucks, McDonalds, etc., in India. Gloria Jean's Coffee India's funds have been raised in the company's founder Jayaprakash M's individual capacity.

The coffee market didn't exist 10-15 years ago. Tea is the dominating drink in India, so everybody in the business is still trying to create more awareness about coffee. But the business could do well in its second stint since there was a gap in the market. They are opening in cities which are already penetrated, so competition could be tough. No coffee chain has tried the fresh food model in India.

India is now the world's 10th fastest growing market for specialist coffee and tea retail chains, valued at Rs 2,570 crore in 2018, according to Euromonitor.

Earlier this year, HaldiramBhujiawala bought The Coffee Bean & Tea Leaf India franchise.

Jelly Belly to acquire Gimbal's jelly bean brand

Jelly Belly Candy Co. will acquire the Gimbal's jelly bean brand, Scottie Dogs licorice and other chewy candy from Gimbal Brothers, LLC by the end of the year.

Lisa Rowland Brasher, president and CEO of Jelly Belly said that they were grateful to the Gimbal Brothers team for their collaboration during the closing of this agreement and are both working hard to make this seamless for retailers, brokers and buyers.

Jelly Belly owners, the Rowland family, have known the Gimbal family, former owners of the Gimbal's

brands, for three generations. Jelly Belly said that family association, combined with Gimbal's reputation for fine candies, made this opportunity for Jelly Belly to expand product offerings and distribution in the marketplace.

Private investment firm Highlander Partners acquired Gimbal's in April 2017 to build its portfolio of confectionery and snack brands, called Bettera Brands. It also includes Hillside Candy, which Highlander Partners acquired in November 2016.



CONSULTING PAPER

FSSAI to review method of applying for licences



The FSSAI has issued a consulting paper to review the existing methodology for applying for licences under the Food Safety and Standards Act. Under the proposed method, FBOs (food business operators) will have to choose from a list of categories based on generic and specified standardised products.

The paper stated that it had been proposed to change the methodology of applying for licences under the Food Safety and Standards Act, Rules and Regulations made thereunder. Now an applicant will have to simply select the food category system up to two levels, which are simpler to understand and navigate.

"For example, Section 2.0 defines products category of fats and oils, and fat emulsions, which has two sub-categories, viz., 2.1, wherein fats and oils essentially free from water are listed, and 2.2, having fat emulsions mainly of type water-in-oil," it added.

"Once the second level of food category (either 2.1 or 2.2) is selected, a menu of standardised products listing shall be displayed, from which the applicant can select the standardised product for which he desires a licence," the paper stated.

Praveen Jargar, assistant director, regulatory compliance, FSSAI, stated, "The new standardised product lists are based on the Food Safety and Standards Regulations, wherein the standards for

food products are detailed. The description used to denote all food products expressed under the said rule."

He added, "For example, under 5.1.3 all standardised products for chocolate are covered, regardless of whether they are milk chocolate, milk covering chocolate, plain chocolate, plain covering chocolate, white chocolate, or blended chocolate."

Further, the consulting paper said that mapping of the food category system with standardised food products as per the Food Safety and Standards has been attempted, and the licence shall display the name of the food product, along with the corresponding food category at the best level.

It added that the new system was based on a trust and self-regulation approach, wherein the FBO opts for and selects a standardised product, and his licence is approved for the same. However, the onus will be on the FBO to prove that the product manufactured by it falls within the licenced product domain, and any deviation from the specified provisions of the Food Safety and Standards Regulations shall be deemed that FBO is manufacturing without licence.

According to FSSAI, the problem with the existing system is that the text box approach leads to a data which is unique, non-amenable to any statistical and data analytics, and sometimes the FBOs find it difficult to understand and determine the category of the product.

VITAMINS AND MINERALS

FSSAI reveals RDA to enable review of products

The Food Safety and Standards Authority of India (FSSAI) has prepared a document in respect of the Recommended Dietary Allowance (RDA) for vitamins and minerals so that food businesses can review their food products.

The FSSAI has also issued a separate list of essential amino acids for the general population based on references from ICMR (Indian Council of Medical Research).

FSSAI says that under Section 22 of the FSSAct, the FBOs were allowed to use vitamins, minerals, and amino acids not exceeding the RDA for Indians in functional foods, food for special dietary uses, nutraceuticals, and health supplements.

Currently the FSS-Health Supplements, Nutraceuticals, Food for Special Dietary Use, Food for Special Medical Purpose, Functional Food and Novel Food-Regulations 2016 specifies that

addition of nutrients not exceeding the RDA as specified by the ICMR and in case such standards are not specified, the standards laid down by international food standards body, Codex shall apply.

FSSAI, in a statement, said that the apex food regulator was in receipt of representation from stakeholders as well as the regulatory staff seeking clarification on RDA values of different nutrients.

"In this regard, based on the recommendation made by the scientific panel and scientific committee, a collated document in respect of RDA values for vitamins and minerals has been prepared and placed on FSSAI's website. Further, the scientific panel has also recommended RDA values for essential amino acids for the general population using references from ICMR which was endorsed by the scientific committee," read the statement.

The apex food regulator also clarified that the tolerance upper limit of vitamins and minerals which was made available to the public through FSSAI's website in September last year was 'only for information and not for use' by the FBOs in the field of health supplements and nutraceuticals.



HEALTHIER TREND

PepsiCo launches Mtn Dew Zero Sugar

Mtn Dew is introducing a sugar-free version of its original soda. PepsiCo, the brand's parent company, said in the release announcing the drink that the flavor of the beverage will remain the same, just without sugar.

The soda will be called Mtn Dew Zero Sugar and will be available in 20-ounce bottles, 2-liter bottles and 12 packs of 12-ounce cans. A 20-ounce serving will contain 133 milligrams of caffeine with a suggested retail price of \$1.79.

The sugar-free beverage will be sweetened with acesulfame potassium, aspartame and sucralose.

The company's first big step toward that appears to be this reformulation. Mtn Dew Zero Sugar is for consumers wanting to consume less sugar but still indulging in their preferred beverages. This could be a good move for the brand since a 2018 survey found 70% of U.S. adults are concerned about sugar consumption.

The branding for this launch echoes Coca-Cola's Zero Sugar beverage, which came out in 2017 to replace Coke Zero. When Coke chose to change its label to "Zero Sugar" and bring consumers' attention to that word, it was more successful. Coca-Cola CEO James Quincey told The Wall Street Journal in October Coca-Cola Zero Sugar has grown 14% by volume globally in the first 10 months of 2019, while unit sales of the company's 7.5-ounce mini cans in the U.S. had increased 15%.



CHEESE AND MORE

KMF's new launch for Maharashtra's institutional markets

Nandini, the Co-operative milk brand of Karnataka Milk Federation (KMF), has launched Nandini Cheese for Maharashtra's institutional markets - Hotel, Restaurants, Café (Horeca) industry and B2B sector in Maharashtra. It entered the milk market 2 years ago.

The company claimed that it now has a daily supply of about 2.5 lakh litres in the state and is targeting to get a 20% market share of cheese of this institutional segment in the state.

Nandini sells about 2.5 lakh litres of milk in various

forms including Nandini pasteurized toned milk, Nandini special pasteurized homogenized toned milk and long-life Nandini buffalo milk daily. KMF clocked a turnover of Rs. 15,000 crore in FY 2019 and plans to increase its sales to Rs. 25,000 crore in five years by scaling up its production of value added products. The federation aims to invest Rs. 100 crore every year on both green field and brown field expansion within Karnataka and elsewhere.

KMF's current procures 86 lakh litres of milk which it wants to increase to 106 lakh litres in the next three years.

The federation has invested Rs. 500 crore on its expansion. KMF is looking to acquire an existing dairy plant in Maharashtra to serve its customers in Maharashtra.

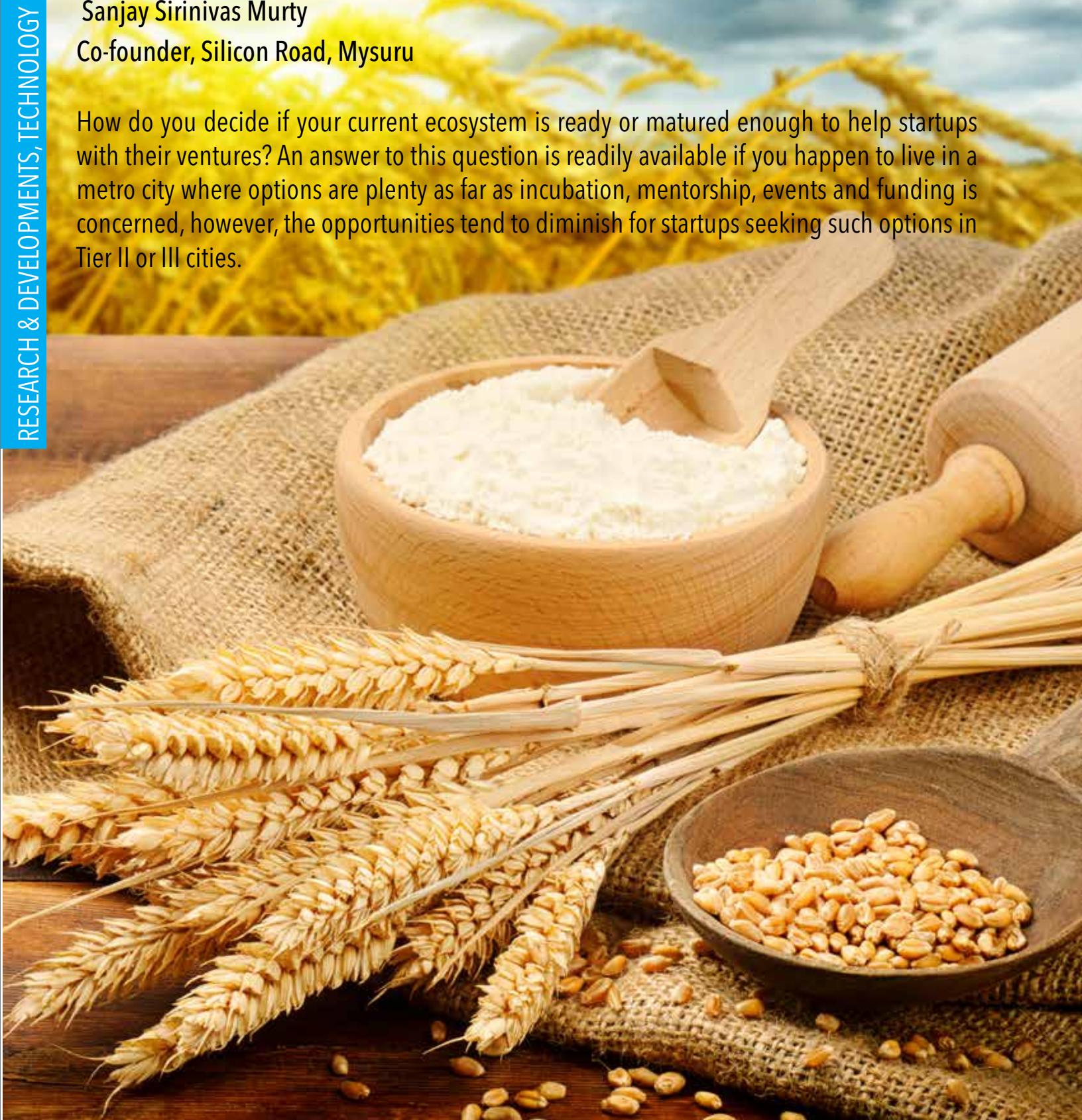
STARTUP ECOSYSTEM IN SMALLER CITIES

Food Tech Perspectives and Resources

Sanjay Sirinivas Murty

Co-founder, Silicon Road, Mysuru

How do you decide if your current ecosystem is ready or matured enough to help startups with their ventures? An answer to this question is readily available if you happen to live in a metro city where options are plenty as far as incubation, mentorship, events and funding is concerned, however, the opportunities tend to diminish for startups seeking such options in Tier II or III cities.



The road less travelled

After successfully launching and scaling corporates, it was time for experienced entrepreneurs to look at building a thriving startup ecosystem in Mysuru, of course another great reason was the green field opportunity, i.e., non-availability of a go to ecosystem for early stage startups. The decision to set up an ecosystem was conceived after interviewing a number of local businesses, early stage startups and understanding their current challenges and hardships. Silicon Road Ideation Labs was conceptualized, and this was the first step towards building a first startup ecosystem in Mysuru.

The slogan "It takes a village to raise a child" an African proverb seemed very apt for an undertaking that Silicon Road was embarking on, however in this particular case, converting the proverb to "It takes an entire city to set up an ecosystem" seemed more appropriate due to nature of initiative.

Understanding the nuts and bolts

There is a general belief that the startup ecosystems fail due to lack of available capital for the startups, this is partially true, however the greater challenges are around lack of available resources (mentors, industry connects, and incubation) to grow an ecosystem

The simplest way was to look at an already fragmented local ecosystem. Silicon Road started mapping out the local ecosystem to ease in new and early stage startups to join the startup ecosystem thus lowering the entry barrier to help them grow.

Three different stages of startups were considered while mapping out the ecosystem, Idea Stage, Launch Stage, and Growth Stage startups with key objectives to clearly map out the available media sources, events, workspaces, accelerators, incubators, angel investors, and available infrastructure.

A theme "MysuruThe Next Destination for Retail and FoodTechStartup Innovation" was decided, however, for Mysuru to become a startup magnet,

programming, mentorship, germination ideas, and funding for aspiring startups were the need of the hour. Partners, evangelists, local institutions, local employers were identified who started to pitch in and subscribe to Silicon Road ideology.

The launch

The first part of the program was to market the Silicon Road Initiative within the city of Mysuru and nearby areas including launch events at all the premier colleges, research institutions, socializing the concept across the technology organizations within Mysore and with the media. The launch event saw staff from each of the partner institutions presenting their research ideas and sharing existing intellectual property that were positioned to solve industry needs.

To further build the culture of innovation and the ecosystem, Silicon Road organized several tech talks, meetups, hackathons and bootcamps to help early stage entrepreneurs take their ideas to a minimal viable product.

One of the important aspects of setting up an ecosystem was identification of physical space to ensure that there was enough infrastructure available to have a great incubation center that actively worked on helping the startups.

The catalyst

The biggest push to the ecosystem support came into play when Silicon Road launched the TiE Chapter in Mysuru, something that was complimentary to Silicon Road initiative but with a greater global reach.

TiE and Silicon Road collectively and carefully planned out new age entrepreneur talks, seasoned founder talks, startup Pitchfest to introduce the industry professionals, lifestyle businesses, students, and aspiring Entrepreneurs to the local network of seasoned and accomplished businesses, entrepreneurs and mentors.

Silicon Road launched a 4-month startup acceleration program providing world-class funded support and infrastructure for startups, particularly in food & retail tech to fast-track the growth with a tailored program, mentoring and network.



- Funding Support: INR 25L seed fund support to eligible startups and access to perks and international & local investors.
- Access to international & local networks Food & Retail Tech corporates.
- Accelerating startups through curated programs
- Mentoring by industry's best mentors & resident experts
- Free office space and infrastructure in Mysuru

The story so far

Silicon Road accelerated 8 startups during the first cohort and funded 2 of the 8 accelerated startups. The funding requirement for the startups was accomplished through Silicon Road fund.

In a continuous effort to further strengthen the ecosystem, Silicon Road has been continuously building mentor networks, partnering with key

Retail & FoodTech corporates, academia and research institutions. Silicon Road is launching its second cohort during early May 2020.

Silicon Road recently also launched a unique conference called Innovation in Food Technology (SRIFFT2020)", with 40+ speakers, 5+ investors, 15+ startup booths and 3 product launches. The conference with a theme of "Innovation" had discussions focused on FoodTech investments, global perspectives in Food Technology, Packaging Disruptions, Corporate Innovations and Future of Food.

Conclusion

A dynamic startup ecosystem is always considered a gateway to job creation, attracting international talent and FDIs. Silicon Road with its global connections is collaborating across ecosystems in building a robust Food and Retail Tech ecosystem in Mysore.

An Overview of High Pressure Processing

Shivani, Anil Kumar Verma, Pritam Chand Sharma,
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High Pressure Processing (HPP) is a procedure used to achieve microbial inactivation. It inactivates vegetative bacteria, yeast and moulds using pressure upto 600 MPa at ambient temperature and can inactivate spores, when combined with high temperature (High Pressure Thermal Processing) or Thermal Assisted HPP.

HPP retains most of the sensory and nutritional quality of liquids or solids or chilled products. Its effect on enzymes is variable. Research into the application of HPP for food technology began when Hite (1899) demonstrated that the shelf life of milk and other products could be extended by pressure treatment. This technology applies high hydrostatic pressure to materials by compressing the surrounding water and transmitting pressure throughout the product uniformly and rapidly (Hyashi, 1989). In general, high pressure inactivates microorganisms, modifies biopolymers including enzyme inactivation, protein denaturation and gelatine, modifies the physico-chemical

properties of water, while leaving nutritional values, colour and flavour components largely unaffected. The first commercial HPP treatment products appeared in the market in 1991 in Japan, where HPP is now being used for products such as fruit juices, jams, sauces, rice, cakes and desserts.

Food products provide a good environment for growth of microorganisms, which may cause food-borne diseases. For this reason, the control of microorganisms is an important aspect of food quality and safety. Many methods of food preservation are used for ensuring microbiological safety and extending food shelf life. High Pressure processing also called ultra-high pressure or high hydrostatic pressure is a non-thermal food processing technology. In food products, this process causes no damage or distorts as long as the food is treated with pressure. The food product to be treated at high

pressure is packed in a flexible container and placed inside a pressure vessel submerged in liquid medium (mostly water), which transmits the pressure.

Introduction

High pressure processing (HPP) is a non-thermal, eco-friendly novel food processing technology whereby food is subjected to high iso-static pressure generally in the range of 100-600 MPa at or around room temperature. HPP is also known by different terms i.e. High-pressure Technology (HPT), high hydrostatic pressure (HHP), Pascalization or ultra-high pressure (UHP) processing. Increasing demand for foods with reduced amount of chemical additives and less physical damage has increased the need for application of hurdle concept, which made good potential for development of new non-thermal processes for food preservation or product modification. The use of high pressure to destroy spoilage and pathogenic microorganisms in food was first reported by Hite (1899). High hydrostatic pressure treatments are independent of product size and geometry, and their effect is uniform and instantaneous. HPP induces a number of changes in the morphology, biochemical reactions, cell membrane and spore coats. Many intracellular cell organelles well as enzyme activity in the foods. Cell membrane is the primary site of pressure

damage to the microbial cells. Pressure up-to 450 MPa at about 20-25 °C has been used to inactivate the vegetative forms of microorganisms. Pressure (450-800 MPa) eliminates sporeformers whereas in case of milk proteins, high pressure showed that no denaturation of β -lactoglobulin occurred up to 150 MPa but at higher pressures significant denaturation occurred during the pressure holding time. Milk treated at pressure of 500 MPa for a few minutes has been shown to have a shelf life at least equivalent to high temperature short time (HTST) pasteurised milk. High pressure treatment also inactivated heat liable form of pectin esterase (PE) in orange juice and grapefruit juice. The Japanese company 'meidiya' introduced the first high pressure processed food, a jam in April, 1990 and followed it in May 1991 with a variety of high pressure processed fruit yoghurts, fruit jellies, salad dressings and fruit sauces. In 1991 also, the Japanese firm Pokka and Wakayama installed a high pressure system for bulk treatment of citrus juices with a capacity of 6000 and 4000 l/h respectively. Now-a-day, HPP is widely adopted because of reported quality improvement and shelf life extension of various foods.

Purpose and application

The main purpose of HPP is to minimize the freshness and flavour qualities of the food stuffs



while achieving the required level of food safety. The significant advances of HPP technology is to produce food products which are safe, fresh, nutritious and innovative. In the food industry, the main field of application of HPP is food preservation. Food spoilage is very often caused by microorganisms and biochemical processes catalyzed by enzymes. With HPP, a great part of microorganisms can be destroyed and most of the enzymes can be inactivated.

Using HPP treatment, undesirable changes and thermal degradation of heat-sensitive food components can be avoided, a major advantage of this technique. It also affects biochemical reactions. Pressure reduces the size of the molecules and promotes bond formation between side chains. Protein molecules are denatured under high pressure. This is a complex phenomenon: it depends on the structure of the proteins, the extent of the pressure, the temperature and the pH.

Principle of High Pressure Processing

During HPP, the pressure is applied uniformly and simultaneously in all directions. It is called iso-static pressure and it is the reason why food is not crushed during the treatment. Once loaded and closed, the vessel is filled with a pressure-transmitting medium. Air is removed from the vessel with an automatic de-aeration valve by means of a low-pressure fas-fill-and-drain pump, and high hydrostatic pressure is then generated by direct or indirect compression or by heating the pressure medium (Mertens, 1995).



According to Yordanov and Angelova (2010), High-Pressure technology has been cited as one of the best innovations in food processing from the last 50 years. Some physical and chemical changes result from application of pressure. Physical compression during pressure treatment results in a volume reduction and an increase in temperature and energy.

The basic principles that determine the behavior of foods under pressure are:

Le Chatelier's principle: Any reaction, conformational change, phase transition, accompanied by a decrease in volume is enhanced by pressure.

Principle of microscopic ordering: At constant temperature, an increase in pressure increases the degrees of ordering of molecules of a given substance. Therefore pressure and temperature exert antagonistic forces on molecular structure and chemical reactions.

Iso-static principle: The food products are compressed by uniform pressure from every direction and then returned to their original shape when the pressure is released. The products are compressed independently of the product size and geometry because transmission of pressure to the core is not mass/time dependent thus the process is minimized.

Advantages of HPP

- High pressure is not dependent of size and shape of the food,
- Elimination or significant reduction of heating, thus avoiding thermal degradation of food compounds,
- High retention of flavour, colour and nutritional value,
- High pressure is independent of time/mass, that is, it acts instantaneously thus reducing the processing time,
- Reduced requirement for chemical additives,
- Potential for few food product designs due to the creation of new textures, tastes and functional properties,
- It does not break covalent bonds; therefore,

the development of flavours alien to the products is prevented, maintaining the natural flavour of the products,

- It can be applied at room temperature thus reducing the amount of thermal energy needed for food products during conventional processing,
- Since high pressure processing is iso-static (uniform throughout the food); the food is preserved evenly throughout without any particles escaping the treatment,
- The process is environment friendly since it requires only electric energy and there are no waste products.

Limitations:

- HPP is not practiced because the capital cost for a commercial scale.
- High Pressure treatment shown substantial economic losses because there is implementation of comprehensive quality assurance programmed to eliminate or reduce micro-organism in processing,
- Food enzymes and bacterial spores are very resistant to pressure and require very high pressure for their inactivation,
- The residual enzyme activity and dissolved oxygen results in enzymatic and oxidative degradation of certain food components,
- Most of the pressure-processed foods need low temperature storage and distribution to retain their sensory and nutritional qualities,
- Foods should be water free for anti-microbial effect.



Applications of HPP

The literature pertaining to different applications of HPP in the food industry especially milk and milk products, fruits and vegetables and animal products is summarized in Table I, Table 2 and Table 3 respectively.

Effect of HPP on Microorganisms: HPP can be utilized either as a cold pasteurization process or as in combination with thermal energy for pasteurization. Generally, a moderate level of pressure (10-50 MPa) decreases the rate of reproduction and growth of microorganisms whereas a higher level of pressure leads to microbial inactivation.

i) Bacteria

HPP treatment under proper conditions can result in the inactivation of both pathogenic and spoilage microorganisms in food products. The inactivation of bacteria is ascribed to various types of damage accumulating inside the cell. The main bacteria that cause food poisoning are *Campylobacter* spp., *Salmonella* spp., *Listeria monocytogenes*, *Staphylococcus aureus*, *Escherichia coli*, and *Vibrio* spp. Among them, *L. monocytogenes*, *S. aureus*, and *E. coli* are probably the three most intensively studied species in terms of use of HPP processing. HPP treatment under proper conditions can result in the inactivation of both pathogenic and spoilage

microorganisms in food products. Although significant antibacterial effects can be obtained if the appropriate HP treatment (300-600 MPa) is conducted, the pressure resistance of bacteria is highly variable, being dependent on the species of bacteria and the food system involved. Generally, gram negative bacteria are less pressure resistant than gram positive bacteria, due to structural differences in the cell envelope.

ii) Bacterial Spores

Bacterial spores can resist various stresses, including heat, pressure, radiation, chemicals, and desiccation. This high resistance is described to the thickness and structure of the bacterial spore coat (Reddy et al., 2006). Although HPP is effective in inactivating bacterial spores. During HPP processing, it is thought that the spores are first germinated through the activation of nutrient germinant receptors at moderate pressures (50-300 MPa). However, the resultant germinated spores are sensitive to pressure, and they are subsequently inactivated as higher pressures are reached (Black et al., 2007). In general, bacterial spores are highly resistant to pressure at ambient temperatures and only very high pressures (>800 MPa) can achieve a marked loss of viability in the spores under these conditions.

iii) Fungi

Fungi are mainly divided into two groups based on their structures: unicellular fungi (yeasts) and those producing hyphae (molds, mushrooms, etc.). Generally, HPP can produce greater destructive effects in organisms with a greater degree of structural complexity. As a result, yeasts and molds are more susceptible to pressure than bacteria, and can be inactivated using relatively low pressures. In most cases, treatment at pressures from 300 to 400 MPa for a few minutes is sufficient to inactivate most yeast cells.

The mycelia of molds are particularly susceptible to HPP, while mold spores appear to be much more pressure resistant. Pressures between 300 and 600 MPa can inactivate most molds (Smelt, 1998). However, the ascospores of heat resistant molds, such as *Byssochlamys* spp., can even withstand pressures higher than 600 MPa. A combination of pressure greater than 600 MPa and temperature higher than 60 °C has been found effective for

inactivating ascospores of heat-resistant molds in practical application. In addition, the pressure resistance of the heat-resistant ascospores of mold increases with their age, and this factor should be considered when using HPP for the inactivation of molds.

Effects of HPP on food quality

HPP treatment at certain conditions can alter the physicochemical, sensory, and functional properties of food ingredients, particularly protein, lipid, and starch (Rivalain et al., 2010; Liu et al., 2008). The following sections will discuss the influence of HPP on four aspects of food quality: food color, texture, sensory quality, and yield.

i) Food Color

For fruit and vegetable based products having natural pigments (e.g., anthocyanins, carotenoids, chlorophyll), moderate HPP treatment has a limited effect on their color characteristics. However, the stability of pigments can be affected by HP at a high temperature and/or a high pressure. For example, raising the temperature to 50 °C during pressurization resulted in the degradation of chlorophyll in broccoli juice (Oey et al., 2008). The color-related compounds in HPP-treated fruits and vegetables, especially anthocyanins, may become unstable during storage, probably because of incomplete enzyme inactivation and the presence of ascorbic acid (Oey et al., 2008). In addition, browning, condensation with phenolic compound, and textural change can also result in the change of color in HPP-processed plant-based



products during storage (Cao et al., 2012). HPP can produce dramatic changes in the chromatic parameters of fresh meat and loss of red color (Bajovic et al., 2012; Canto et al., 2012). HP can also produce redness changes in fish and related products. However, the effect of pressure on redness is highly dependent on the fish species and treatment conditions. The effects of HPP on color of some fruit products is given in table 4:

ii) Food Texture

Due to enzymatic and non-enzymatic reactions, texture changes in fruits and vegetables can be related to transformations in cell wall polymers (Oey et al., 2008). To modify the texture of certain food products, HPP has potential as a technique. HPP treatment of Mozzarella cheese significantly accelerated the development of desirable functional properties on melting (O'Reilly et al., 2002). HPP can benefit the meat industry by modifying meat texture and consequently producing novel meat products. For pre rigor meat, pressurization ranging from 100 to 200 MPa is effective for increasing tenderness (Ma and Ledward, 2013). Chan et al. (2011) reported that HPP at 200 MPa increased the springiness in low pH turkey meat and the cohesiveness and resilience in both low and normal pH turkey meat. However, it is necessary to raise the temperature when it comes to tenderizing post rigor meat by means of HPP (Sun and Holley, 2010).

iii) Food Sensory Quality

Sensory analysis is the most straightforward way to evaluate the quality and consumer acceptance of food products. HPP has proven a promising preservation technology that can ensure food safety and retain the sensory characteristics of fresh food products, the sensory quality of foods can still be affected by HPP to a certain extent. Intrinsically, alterations in the sensory characteristics of HPP-treated foods are associated with the physical and chemical changes induced by HPP.

On the other hand, the negative influence of HPP on food sensory qualities can be minimized by selecting proper processing parameters. For example, HPP processing at 600 MPa enhanced in mouth sensations of a red wine, such as sour, bitter, and astringent tastes, whereas no statistically significant difference in overall quality was found among HPP-treated and untreated wines (Tao et al., 2012). As for seafood, the increase in hardness following pressurization is also not detrimental, since post mortem softening occurs rapidly (Murchie et al., 2005). Furthermore, HPP treatment was found to increase the contents of ester compounds in strawberry puree, which are an important group of flavor compounds (Lambert et al., 1999).

In general, although HPP cannot always retain the original sensory properties, the overall quality of many HPP-treated food products have actually





proven superior to traditional heat-treated ones by many researchers. Since several food products processed by HPP have already been commercialized, it is necessary to help consumers understand the mechanism of HPP processing and the advantages of this technology, in order to guarantee the success of HPP-treated food products in the market.

iv) Food Yield

HPP treatment can give a higher yield in food products than thermal treatment and treatment without pressurization. HP treatment can give a higher yield in food products than thermal treatment and treatment without pressurization. For example, Mor-Mor and Yuste (2003) reported that weight loss was significantly higher in heat-treated sausages than in HP-treated samples. In milk, HP treatment for cheese making can augment the yield of Cheddar cheese by increasing moisture and protein retention in cheese. HPP treatment is effective for oyster shucking. It has been reported that HPP treatment at 241 MPa for 2 min caused detachment of adductor muscle in 88% of oysters, while treatment at 310 MPa, with immediate pressure release, resulted in 100% efficiency of shucking. Fitting oysters with heat-shrinkable plastic bands before treatment holds the shells together and reduces the loss of interval fluid. Oysters treated in this way obviously do not gape and have proved an attractive alternative to traditional live oysters. In addition to reduced labour cost and risks, and increased safety and shelf life of oysters, yield increases of 25-50% using HPP processing.

CONCLUSION

High pressure processing has proven to be an effective technology to reduce the microbial impact in foods for both pathogenic and spoilage microorganisms with less impact on the initial quality of the foods. Application of high hydrostatic pressure in the food industry for various products is growing day-by-day. It has great potential to develop new minimally treated foods with high nutritional and sensory quality, novel texture and with an increased shelf life. In general, it can be stated that high hydrostatic pressure treatment as a food processing technology in practice, requires optimization in case of every single product type. This method is microbiologically efficient and quality protective but further researches are necessary to prevent changes in lipid oxidation and regeneration of sub-lethally injured microorganisms in pressure treated foods during storage keeping in view, the current cost and capacity limit of the high hydrostatic pressure technology, it can be said that it is unlikely to replace conventional thermal processing, but it could offer commercially feasible alternatives in the case of novel food products with improved functional properties, that cannot be attained by conventional heating which will reduce the bioavailability of the functional component.

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INDIAN FOOD PROCESSING INDUSTRY

Growing leaps and bounds

Dr. Bhushan Yengede

Director, Binder Technology Consultancy

The Indian Food Processing Industry is one of the largest in the world with respect to production, consumption, export and growth prospects and the Packaged Food sector is the fifth largest industry in India.

Being the second largest Packaged Food market in Asia, India is behind only USA, China, Brazil and Mexico in the world ranking. With increasing population and changing lifestyle trends around the world, increased consumption of processed & packaged food and beverage is observed.

At present, India's Food Packaging Industry is evaluated at around \$12 billion and is likely to reach \$18 billion soon. Study shows that in the period from 2012 to 2016, the growth of the Food Packaging sector in India has doubled to 13.7%.

A promising sector with huge potential

India's Packaged Food Industry is still at a nascent stage (with a per capita consumption of only 24 kg annually) and has tremendous scope of growth. What are the factors that support the growth of the Food Processing & Packaging Industry in India?

According to a recent survey, by 2017 the market of Processed and Packaged Food in India had

reached \$50 billion, and consumption increased by 11% annually to reach 829 million tonne. The amount spent on Packaged Food per household in India has increased by 32.5% and is expected to reach 35% soon. Out of 899 billion litres of beverage consumption around the world in 2015, India consumed 22 billion litres, and the demand for beverages in India increased by 80% by 2017.

Flexible versus rigid packaging

Flexible Packaging is currently the preferred choice for food products over rigid packaging due to the ease of handling, storing, disposing and at the same time it is more economic and keeps food fresh for a longer period. However, flexible packing uses materials that are not suitable for recycling and reuse, and plastic waste management has been a rising concern in India. The Government of India this year recently notified a new policy for plastic waste management to address this issue in a more sustainable way.

With the new policy and the Government's focus on a cleaner India through campaigns like 'Swachh Bharat', it is now a propitious time to introduce improved and innovative technologies into India. Global companies like Dow and Bosch are making efforts to produce special packaging solutions (like the all-polyethylene (PE) solutions - such as Innate and Retain) which are easy to recycle in order to overcome the challenges faced by the flexible packaging industry in India.

Policy stands hand-in-hand with growth potential

The Indian Government has approved Joint Ventures, 100% export oriented units, foreign collaboration and industrial licenses with investment worth \$3 billion in the Food and Beverage Packaging Industry, of which foreign investments is over \$1.4 billion. Moreover, apart from the Indian Government's recent FDI revolution that permits 100% FDI in the Food Processing sector through automatic route, the Government has permitted 100% FDI in trading and e-commerce for food products manufactured and produced in India through approval route. Additionally, the Indian Government has also reduced the excise duty on Food Processing & Packaging machinery from 10% to 6%.

The Indian Government in its 12th Five Year Plan (2012-2017), presented a Scheme for Technology Upgradation, Establishment, and Modernisation of Food Processing Industries under the National Mission on Food Processing (NMFP) with the aim of increasing food processing & value addition, reducing wastage, increasing exports, as well enhancing the income of farmers. The Scheme envisions an increase in FDI in the Food Processing Industry in India, which will be advantageous for the overall development of the industry and in turn also generate employment opportunities in India. With the help of more industry-friendly policies, the Government wants to ensure that India captivates modern technology in this sector.





However, the major challenges for the Food Processing & Packaging Industry in India are a lack of skilled labour and food safety, which is motivating the industry to now invest more in automation.

Opportunity galore for foreign investors

With the Indian Government's focus on and offer to hand-hold and facilitate foreign investors interested in investing in the Food Processing Industry, there is immense scope for foreign companies looking at investing in India. Union Minister Harsimrat Kaur Badal, at a recent industry

event, stated that the Indian Food Processing Industry is expected to treble in the coming years. In this regard, the Ministry of Food Processing Industry (MOFPI) is planning to develop a special package for the sector to promote exports

Conclusion

In view of the anticipated growth and the industry's inclination towards modernization, a boost in demand for equipment and machinery for Food Processing & Packaging is certain. Multinational companies interested in India should not miss this opportune time to invest in such a huge consumer-based market.

TECHNOLOGY IN RESCUE

Tech Intervention to combat malnutrition

P L Kaul

MD, Mariental India (Pvt) Ltd

The scourge of malnutrition prevailing mainly amongst the poor children, adolescent girls and women in India has been and continues to be a matter of serious concern ever since our independence.

Introduction

The country is fighting a relentless battle to eradicate this menace which poses a threat to increase the unhealthy and mentally deficient segment of population. In this endeavor the Central Government has been budgeting huge funds allocations for the purpose of providing free meals to the women and children from the poor and destitute class of the country's population. These free meal packs are formulated in a way to supplement their food nutrition in terms of the stipulated norms for energy, protein, minerals, vitamins and micronutrients.

Government initiatives

The Central Government has been operating two schemes to combat malnutrition in the country i.e.

- Providing free Mid-Day-Meal Scheme to the school children up to 8th standard in the Government and aided schools. The scheme is financed, facilitated and monitored by the Ministry of HRD, Govt. of India and assisted

by the respective State Governments.

The program of providing MDM to children is primarily Nobel idea not only to provide necessary nutrition to the children in lower schools but also to motivate their parents to send their children to schools for getting educated.

- Providing free suitably formulated meal packs as "Take Home Ration" or THR to the poor lactating and pregnant women for themselves and separately for their infants, and also to the poor adolescent girls. The scheme is financed, facilitated and monitored by the Ministry of Women & Child Development, Govt. of India and assisted by the respective State Governments.

The statutory nutritional requirement of the meals served under the Mid-day-Meal Scheme (MDMS) of the Ministry of Human Resource Development (MoHRD), Govt. of India, in terms of the quantity and nutritional composition is presented in the following table:

S. No.	Type of Meal to be served per day per Beneficiary	Qty. to be served	Nutrition Composition		
			Energy	Protein	Vitamin / Minerals
1	Morning Snacks (Sweet)	50 gm	200 K.cal	5.0 gm	As per RDA norms
2	Mid-day-Meal	75 gm	300 K.cal	7.0 gm	As per RDA norms
3	Total Nutrition Composition	125 gm	500 K. cal	12.0 gm	As per RDA norms

Note: Price Fixed per meal per beneficiary = Rs. 6.00

The statutory requirements of the meals to be served under the ICDS Program of the Ministry of Women and Child Development (MoW&CD), Govt. of India, in terms of the quantity and nutritional value are recommended as presented in the following table:

S. No.	Beneficiary	Quantity (gms./ pack)	Nutritional Norms as Stipulated		Price, Fixed (Rs./ Pack)
			Energy (Calories/ pack)	Protein (gms/ pack)	
1	Children between the age group of 6 months to 3 years	125	500	12 to 15	6.00
2	Children between the age group of 3 years and 6 years				
i.	For mid-day-meal	75	300	7 to 8	6.00
ii.	For Morning snack	50	200	5 to 7	
3	Pregnant and Lactating Women	150	600	18 to 20	7.00
4	Adolescent Girl	150	600	18 to 20	7.00

Note: Vitamins & Minerals per Meal pack as per Recommended Daily Allowances RDA

Capital Outlay

A Budget towards MDM scheme for the financial year 2020-2021, has been fixed at Rs 12,054 Cr. The existing infrastructure to serve MDM to the Children in schools constitutes of:

- i. 6.70 lac Kitchens-cum-Stores constructed to ensure safety of Food Grains & Hygienic Meals for School Children covered under MDM Program

ii. 25.70 lakh Cooks-cum-Helpers mainly from SC/ST/OBC Communities are involved in serving MDMs to the Children in the Govt. & Aided Schools in India.

iii. The total No. of NGOs involved in MDM Program is 447 with U.P leading with 182 followed by Karnataka with 102 NGOs

The Capital outlay on ICDS Programme to Combat Malnutrition among the poor Children, Women



& Adolescent Girls for 12th FYP has been a staggering amount of Rs. 1,23,580 Cr. averaging out about Rs. 24,700 Cr. per annum.

Now the question remains whether the huge allocation of funds by the Central government has been able to meet the desired success in combating malnutrition in India. The answer remains far from any satisfactory results. The CAG findings with regard to the operation, performance and the success achieved is briefly described as under:

Fault lines

CAG report on the appalling fault lines of MDMS are summarised as under:

- i. Despite guidelines, teachers were actively involved in buying, cooking and serving of meals, thereby compromising on teaching hours.
- ii. Despite the fact that the scheme having been in existence for more than a decade, the govt. is yet to establish a dependable system for its evaluation.
- iii. Despite release of funds by the Govt. of India for kitchen-cum-stores, the State Governments

and implementing agencies failed to release these funds on time.

- iv. Preparation of food in the open, engaging children for cooking and use of empty paint containers to serve meals are some of the shocking instances.
- v. Lack of adequate utensils, gas stoves and potable water for cooking and drinking, test-checked schools in 12 states.
- vi. 92% of the schools did not have kitchen sheds
- vii. In A.P, 95% of Central funds released in 2007-08 for building kitchen sheds remained unutilized as of March 2008.
- viii. In West Bengal, during 2004-05, cooked meals were served to only 63% of the targeted days.
- ix. 418 outside children, not studying in the school, consumed meals in 18 schools on the day of the surprise visit by audit.
- x. In U.P, children of six primary schools were involved in cooking mid-day meals adversely affecting their studies.

The mass media in the country has been reporting regularly the horrible incidents pertaining to the



cooking and serving of the MDMs to the children in schools, through the kitchens operating in unorganized sector. It is reported that about 33% of the food grains released for the MDM scheme go waste. The children are reported to be underfed in violation to the statutory regulations covering the quality and quantity to be served per beneficiary per day. Embezzlements are reported being rampant in almost every state.

Understanding the shortcomings

Allowing the cooking of meals in schools is itself a major flaw in the system. The meals are prepared and served in unhygienic conditions. The media reports come regularly indicating the cases of food poisoning including the fatalities taking place after consuming the MDM, insects and lizards found in the meals served to the poor children, the mishaps occurring with the children who are made to work on the preparation of MDM. Such disgusting occurrences do not take place in the schools in remote areas only but are also reported even from the Capital City of Delhi. It is therefore clear that most of the funds allotted go waste to meet the objective, as the beneficiaries are either deprived of the meals or the meals offered do not conform to the statutory quality norms as specified for quantity and the nutritional composition, to help combating the scourge of malnutrition in the country.

The fundamental shortcomings in the execution of these government aided scheme which defying the purpose that they are aimed for would be summarized as under:

- i. Lack of ethical practices
- ii. Lacks of ethical practices
- iii. Unhygienic cooking practices
- iv. Unhygienic serving practices
- v. Absence of quality monitoring system
- vi. Absence of nutrition monitoring system
- vii. Lack of accountability
- viii. Lack of transparency &
- ix. Pilferage & Corruption



Present status

It is unfortunate that despite the concerted efforts of the Central Government, achieving any breakthrough in eradication of malnutrition in the country has been rather deplorable, as substantiated by the following figures on record:

- i. The infant mortality in India i.e. 32 per 1000 live birth (2017) is one of the highest amongst the developing countries and is even worse than the statistical data from Bhutan, Nepal, Bangladesh and Sri Lanka.
- ii. Number of infant death in India in 2018 due to malnutrition is reported at 8, 02,000, this is again the highest of any country in the world.
- iii. The population of stunted children in India represents 32% of the total population in the world.
- iv. About 25% of the world's population of children suffering from malnutrition are from India.

Recommendations

The possibility to rectify the existing system so as to prevent the corrupt practices and to ensure that the beneficiaries i.e. poor children and women get the meal packs conforming to the stipulated norms

in quantity and quality, to combat the scourge of malnutrition from the country, is achievable only through the "Technology Interventions". The following ways are recommended for removal of the fundamental fault lines in the system:

1. Stop the practice of getting the meals cooked in schools forthwith.
2. Divest the school authorities of their responsibility related to MDM Scheme like purchase of raw-materials, food ingredients and other auxiliaries.
3. The meal-packs supplied under ICDS Scheme should be in the Ready-to-Eat mixture of nutritious food ingredients in dehydrated form in pilfer-proof packaging.
4. All the dispensing data to record the inventory of the number of meal packs supplied, number of Children served, and the number left behind and carried forward, has got to be digitized and recorded on the central computer system.
5. Once a month medical check-up of each child to be done and recorded to ascertain the fall in malnutrition indices.
6. The meal-packs to be properly labeled as per the norms stipulated under FSSAI.
7. The movement of the meal-packs to be computerized for tracking, monitoring and recording
8. The ICDS take home packs or MDM served on spot are recommended to be prepared in large scale on continuous process plants, under stringent QC norms so as to ensure that the stipulated nutritional norms & cost/unit is made possible.
9. The Ready-to-Constitute meal packages are recommended to be in dehydrated form easy to reconstitute and packed in sealed & pilfer-proof poly-bags with 3D hologram & Bar-Code affixed on the master pack, indicating also the residual shelf life, the list of ingredients and the nutritional composition.
10. The process of reconstitution shall be like "Open the pack, drop the contents in boiling water, hold for 3 minutes and serve.
11. The meals are required to be served in sterilized and disposable plates that are biodegradable.
12. The place of serving has got to be a clean covered area free from dust and flying insects and equipped with hand washing facilities etc.

Salient Features

The major advantage of supplying the meal-packs to the poor women and children in specially processed in dehydrated Form packed in sealed and pilfer-proof poly bags are the following:





- i. They are easy to handle and economic for transportation
- ii. The packs are sealed with inert gas and placed inside pre-printed cartons sealed from outside and labeled with all the mandatory details about the product.
- iii. The products offer longer shelf life even under ambient condition.
- iv. They are not messy as the food products like curries in semi-solid form.
- v. They are easy to reconstitute and therefore termed as convenient foods.
- vi. Being produced on a large scale on automatic plants, the cost of production per unit is far less than the meals prepared in small kitchens in which the handling is mostly manual and unhygienic too.
- i. Cleaning, Sorting and Pre-preparation of the Raw Materials
- ii. Processing of Raw Materials into Dehydrated form, which offers instant reconstitution in hot water and
- iii. Independent area for proportioning the mixtures of various pre-processed products and their packaging.

The operating procedure

The process for large scale manufacture of MDM/ ICDS meal packed in sealed and pilfer-proof poly bags has been developed by MIPL in association with its associates in Germany and Holland. The meal presented in dehydrated form is specially formulated out of grains, lentils, and vegetables, cooking oil and other food ingredients and textures so as to conform to the norms stipulated in terms of the quantity of serving per head per day as well as its nutritional composition. The process plant comprises of following 3 major sections:

Conclusion

The process of manufacture at large scale proposed initially for a capacity of 1250 million meals per day equivalent to 1,60,000 TPA, of which the grains and lentils constitute almost about 70% of the total volume. The cleaned grains and lentils are charged into the plant and subjected to saucing. Thereafter it is steam-cooked and dehydrated under controlled conditions of temperature and pressure to produce the finished product in dehydrated form.

The vegetables are washed, cleaned, cut and blanched. The blanched vegetables are cooled and de-watered and then subjected to Microwave Vacuum Dehydration.

The ingredients as produced above are mixed along with the ready mixes of vitamins, minerals and micro-nutrients, the quantity of which is as per Recommended Daily Allowance (RDA). The mixture of raw material is then transported pneumatically to the packaging section, where as many as 12 fully automatic packaging machines are kept in operation for packaging of the finished products.

A large pile of raw potatoes, showing various sizes and skin textures, filling the background of the article.

AGRO-BASED ECONOMY

Potato Value Chain in India

Kamlesh Karamchandani

The Indian Economy is primary agro based as over 58% of Indian population is directly involved in the occupations related to agriculture which is the main source of livelihood. The country is the leading or the second largest producer of many Fruits & Vegetables in the world. When it comes to Potato, India is the second largest producer with estimated production of 52 million tons in 2019. But when it comes to processing, India is not even in top 10 nations as Potato processing is insignificant.

Introduction

In view of the prevailing primitive post-harvest handling system of the harvested crop and inadequate cold storage capacity, the wastages of potato are figured around 7% of the total production, which is about 3.5 million tons valued

at INR 3500 Cr. approximately at farm level price.

It is therefore of paramount importance for the country to modernize the post-harvest handling system for the crop, create adequate cold storage capacity and encourage the processing of potatoes in a big way, so that this crucial wastage is prevented. The processing is also going to add substantial value to this horticulture produce, which in turn will result in the economic benefits to the farmers and prevent the wide variation of the prices of the raw potato between the harvesting and the off season much to the disgust of the common consumer.

India in comparison to others

The percentage of processing of potatoes in the advanced countries exceeds 65% which

contributes a great deal to the development of their rural economy. The concept of processing & value addition of potatoes into a diverse product range started in India about 20 years back with the manufacturing of Potato Chips. The market success with the consumer acceptance of the product motivated PepsiCo to set up more processing facilities for manufacturing Potato Chips, which attracted a few more domestic companies to follow suit. Thereafter McCain, a

Canadian company started their unit in 2008 and HyFun Foods built their first processing unit in 2015 for manufacturing of Frozen French Fries & Potato Specialties at Gujarat.

India is still in its infancy as a potato processing country which gets illustrated from the following table, comparing the existing raw Potato utilization pattern between USA and India.

Comparative Analysis of Potato Utilization Between India & USA

S. No.	Potato Utilization, as	India		USA % of Total Potato Production
		Qty. in mn. MT	%	
1	Sale as Table / Fresh Stock	37.00	71.15	20.00
2	Processed into	2.80	5.38	64.00
i.	As Potato Chips	2.30		
ii.	Frozen French Fries	0.30		
iii.	Potato flakes	0.20		
3	Exports	0.60	1.15	Included in '2'
i.	Table/Fresh Stock	0.40		
ii.	Potato Chips	0.20		
4	Seed Potato & Stock	5.50	10.58	7.00
5	Shrinkage	2.60	5.00	4.00
6	Sale as Livestock feed	-	-	5.00
7	Other losses	3.50	6.74	-
Total	52.00	100.00	100.00	



The above data reveals that the maximum quantity of Potato consumed in India is as fresh produce sold in the domestic market, while a small percentage is exported to countries like Nepal, Maldives, Mauritius, Indonesia, Saudi Arabia, Kuwait, Oman etc. The potato processed into Chips is again consumed maximum in the domestic market with the brands produced by PepsiCo (Lays), Balaji Wafers, ITC (Bingo), Haldiram, Yellow Diamond etc. These high-quality branded Chips are produced from potato varieties like Kufri Chipsona, Lady Rosetta and Atlantic procured from Gujarat, Madhya Pradesh, Uttar Pradesh, Punjab and West Bengal.

India so far

The country has also done well by successfully producing the potato varieties like Santana, Innovator, Frysona and Kennebec suitable for manufacturing Frozen French Fries, the major producers of which are McCain, HyFun Foods and Iskon Balaji. All these companies have preferred Gujarat as their base as these potato varieties are grown well here due to the favorable agro climatic conditions. The state has emerged as the leading producer of the processing variety of potatoes, which has ushered in an era of prosperity for its farmers, through higher productivity and superior sale price at the farm.

A year-wise comparison of the cost of potato sold as table variety and as the processing variety is presented in the following table:

Year	Price/kg of Processing Varieties (Gujarat)	Price/kg of Table Varieties (other states)
2015	9.5 - 10	5.5 - 6
2016	9.5 - 10	10.5 - 11
2017	8.0 - 8.5	5.5 - 6
2018	12 - 12.5	10.5 - 11
2019	10.5 - 11	6.5 - 7

In the last few years, India has adopted new technology and modern farming practices for multiplication of the seed potato, which has yielded rich dividends in terms of the quality of potato, superior yields and extended shelf life in modern cold storage.

The necessary areas of support from the Government Agencies to provide boost to the potato processing industry are summarized as under:

- i. They help create awareness amongst the masses on consumption of processed potato products.





- ii. CPRI as well as the R&D Institutions in the private sector involved in the development of newer varieties of potato, to be encouraged, facilitated and provided with adequate financial support.
- iii. To assist the post-harvest handling system for raw potato so that the wastages occurring due to handling and transportation are prevented and rendered economical too.
- iv. Since the Frozen Potato Products command a huge global demand, the products from India have to be made popular, for which financial assistance is urgently required for promotion and campaigning activities through platforms like exhibitions, trade shows & organizing buyer-seller meets.
- v. The MoFPI and the other Government Agencies like APEDA, to get the studies conducted through experienced consultants for identification of new global markets for diverse potato products from India.
- vi. APEDA to promote aggressive lobbying for inclusion of Frozen Potato Products from India into FTA / PTA with Japan, South Korea, Taiwan, China, Australia, New Zealand and African countries.
- vii. The incentive proposed in the new scheme against Merchandise Exports from India Scheme (MEIS) must be more than the previous value as processed potato products from India are competing with large-scale manufacturers from the EU and US.

Conclusion

The future of the potato in India is expected to be highly promising and sustainable for a high profile of growth, through the fast emerging of potato processing industries, in the other major potato producing states of Uttar Pradesh, Punjab & West Bengal and is poised to be the sunrise industry in India.

However, in order to achieve the fantastic potential of this industry, the wholehearted support of the Government would be required, which would attract further more investments in the processing industries and subsequent increase in the export of potatoes in both fresh and processed form.

About the author: Kamlesh Karamchandani is Director, HyFun Foods (Ahmedabad).



CONSUMER SAFETY IS KEY

Self-Regulation Leads to Innovation

Dr. V. Prakash

The Regulations for food safety is an exceedingly complex issue. It requires a very difficult task of harmonization of regulations globally and the industry along with the consumer and scientific and technical updates. And interestingly, this whole process has to happen necessarily with the involvement of all.

As the regulatory norms touch several categories of foods which are becoming more complex day by day. The consumer apparently demands much more information on the label however small the label is. It is a real challenge to the regulators on the one side, the policy makers and scientists on the other side.

The Codex and regulations in each country

As Codex streamlines the overarching guidelines of food safety, it is time to remember that it is not mandatory to cut and paste the guidelines and

call it regulations in any country. Why do I say this? Codex harmonizes basically the scientific principles. Science is universal and the basic principles of food safety are laid down for certain categories of food to ensure safety of food from the hygiene and contamination perspectives. But each country has to work very hard in conversion of the food safety guidelines of Codex, reviewing it every year and adding to it its own document. Same is true for Indian scenario of Industry also and makes the simple laws more complex than Codex itself.

The latest of analytical methods and safety protocols encompasses not only different categories of foods but also the culture. The scale of operation and the affordability of both packed and non packed foods where safety cannot be overlooked is taken into consideration. The reason for such an approach is to focus on more self regulations than the Inspector Raj. One requires honest, ethical and strict internal protocols for foods as well as in the public catering conditions.

FSSAI brought out the Gazette Notification of nearly 425 bioactives into the realm of adding them to foods for either nutraceuticals or nutritionals enhancement to give the benefits to the consumer a healthy food and with all approved list of ingredients in a product for the manufacturer. But it must abide to incorporate such innovations for more bio availability from bioactives and many such advancements in food science that will change the business into a different level.

The latest modifications have to address the real way to go forward in newer products which have all information inclusive and regulations umbrella being focused. The assurance of absence of pesticides taking into consideration the methods and pathogens not by over claiming the nutritional and nutraceutical content already approved but has to converge in the minds of the user. The consumers of the products must be sure that what they have purchased from the market is healthy and safe. Consumer awareness is most important and more programmes from FSSAI at rural level is the need of the hour.

The issue of recall

Many global approaches are there when a food is found to be non-safe but have already been distributed into the market. Such products have to be recalled. But in the Indian system the recall is not that easy since the traceability of the food packet from the manufacturer, to the distributor, to the retailer and to the microdelivery systems and storage level makes it much more complex to recollect. Therefore it is indeed a real challenge for India to ensure compliance at the bottom of the pyramid and to also for the macro regulations to be strictly followed by the manufacturers.

In Indian scenario, manufacturers have to be better equipped for only sampling the food but also be self-inclusive of regulations to be imbibed in their chain so that once a food is packed or given to the consumer for example such as bread. The traditional bridge from the live bakery and all the





way to the community kitchen, the problem gets more and more complex in terms of traceability and enhancing more safety.

The menace of adulteration

In case of intentional adulteration much more rigorous punishment has to be in place more and more in terms of ensuring full safety. It will also send correct signals for such adulterations as there is no end to it currently and also will not be tolerated by the consumers. With the onus on the industry self regulations will thrive and in the society it must ring a bell.

Traditional foods and regional considerations

We must remember India is one country. It requires the Food Safety and Standard Authority of India (FSSAI) even though it has one single law to the country but the freedom of certain advantages based on regions is a necessity. Since India is the group of many such regions almost like the EU and one set of food laws does not

get into the traditional foods of the other region. Therefore, the cultural heritage of traditional foods and traditional ingredients as well as modern processing methods both covering FSDU and FSMP (as recommended in the gazette notification of 2018) must be looked into very carefully. It must also ensure that our export markets standards obviously have to apply locally too with the importing countries. The laws of safe food are also applicable in India and more safe foods are served to the customer as long as those industries ensure compliance of regulations.

Conclusion

In summary, the role of regulatory bodies is to assure safe food for all. It is not that easy to lay down the regulations following all the way to ground reality and also keeping in view of the adulteration database. And also, the modifications have to be year after year and have to be dynamic.

(About the author: V. Prakash, Ph.D, FRSC is Vice President of the International Union of Nutritional Sciences and is the former Director of CFTRI and is Distinguished Scientist of CSIR.)



SYNCHRONIZATION

Industry meets academics on horticulture

Dr H S Oberoi

Principal Scientist & Head, Div. of PHT&AE, ICAR-IIHR

A one day Academia-Industry interface meet was organized by ICAR-Indian Institute of Horticultural Research (IIHR), Bengaluru on 12 February 2020.

ICAR-IIHR, Bengaluru recently organized Academia-Industry interface meet on Mechanization, Value Addition and Processing in Horticultural Crops.

The meet was attended by 89 delegates belonging to Food Processing Industry, Supply Chain Management companies, Catering, Financial Services, FPOs, Government Departments, Academic Institutions, Start-Up entrepreneurs, incubators and Agricultural Machinery Manufacturers in addition to the ICAR-IIHR staff and students.

The meet was attended by Executives from eight Supply Chain Management companies which included prominent players like Big Basket, Reliance Fresh, Waycool Foods and Products Pvt Ltd, Amazon; 12 Food Processing Companies including Coca Cola India, Amul, Nissin Foods, while the catering service industry was represented by Swiggy. Farmer Producer Organizations and SHGs were represented by KisanSaathi, UBUNTU and Parivarthan, while eight Agricultural Machinery Manufacturers also

participated in the meet. The event was also attended by officers from KAPPEC and DIC, Government of Karnataka. Scientists from ICAR-CIAE, Bhopal and Coimbatore, UAS, GKVK, UAS, Raichur also participated in the event.

Need for strong network among institutions

The programme started with an Inaugural session with a welcome address by the Convener, Dr. H.S. Oberoi, Head, Division of PHT and AE, ICAR-IIHR Bengaluru wherein he apprised the gathering about the main theme of organizing such an event, followed by address by Mr. Manoj Rajan, Special Secretary, Food Processing, Government of Karnataka, who apprised the gathering about the new initiatives being taken by the Government of Karnataka in the area of development of food processing clusters in the state. He also highlighted the role of a strong network between the Research Institutes and the Government departments in development of rural food processing hubs. Dr. M.R. Dinesh, Director, ICAR-

IIHR, in his presidential address stressed on conducting Industry driven research and urged the Food Processing Industry to come forward and create more avenues for collaboration with the Academic Institutes. Dr. P.S. Tiwari, Incharge Director, ICAR-CIAE, Bhopal appreciated the idea of having these kind of interaction meetings for solving the ground level problems being faced by the farmers and the Industry. Dr. Prabhakra and Mr. Shivaprasad, farmer representatives and members of Institute Management Committee (IMC) and Research Advisory Council (RAC) of ICAR-IIHR, Bengaluru highlighted the problems of farmers in not getting the remunerative price for their produce. Dr. G. Senthilkumaran, Organizing Secretary proposed a vote of thanks. During the inaugural session, a MoU was signed between ICAR-IIHR and Karnataka State Agricultural Produce Processing and Export Corporation Ltd (KAPPEC) and three publications were also released.

Coming together of Industry and Academia

The technical session on "Fostering Academia-Industry interface collaborations" was chaired by Mr. ManojRajan and co-chaired by Dr. P.S. Tiwari. The session included presentations by Dr HS Oberoi on varieties, machinery and technologies from ICAR-IIHR followed by presentations on Machinery and technologies from ICAR-CIAE, Bhopal by DR PS Tiwari; An overview of incubation at ICAR-IIHR by Dr. CK Narayana; Modalities of technology commercialization through ITMU by Dr.G.S. Pillai; Help required by Fruit Processing Industry from Beverage Industry Point of View by Mr. Asim Parekh, Coca Cola India; Connecting Farm to Forks-Technological interventions by Mr. Navin Kumarfrom Big Basket; AMAP-An Innovative Technique to enhance shelf life of fresh produce by Dr. Raziq Khan from UFlex Ltd; Key challenges in handling of fresh fruits and vegetables in catering industry by Mr. ND Thammaiah, Swiggy; Market linked cultivation-Outgrow by



Mr. Ramanatha Shenoy, Waycool Foods and Products Ltd; Role of AMMA in Mechanization by Dr. Surendra Singh and Innovations in grading of fruits and vegetables through image processing by Mr. Jagadeesh from Zentron Labs.

Exploring market linkages

The second technical session on "Creating opportunities for start-ups in Food processing and Mechanization" was chaired by Dr.M.R. Dinesh and co-chaired by Dr. Veeren Gowda, Dean, College of Agricultural Engineering, UAS, Raichur. The session included presentations and talk by MrUditMangal from PLUSS, Gurgaon on Role of thermal energy storage in farm level solar dryer and cold rooms followed by Opportunities available with C-CAMP for agri based start-ups





by Mr. Shubham Singh; Opportunities for start-ups in Food Processing through E-commerce gateway by Mr. Sachin Achintalwar, Cloudtail; Strengthening FPOs through capacity building and market linkage by Mr. Prem Rathod; Making markets work for the small holders by Mr. Sridhar from Sammunati Financial Services and Vision group investment incentives in Mechanization in Karnataka by Mr. Adwaith, Ernst and Young. The vote of thanks was proposed by Dr. C.K. Narayana, Principal Scientist, ICAR-IIHR and CEO, BESST-HORT, ICAR-IIHR.

Conclusion

Industry representatives were impressed with the varieties, machinery, protocols and technologies developed by ICAR-IIHR, Bengaluru and wanted to have a long term association with the Institute.

Technologies for value added products from

Jackfruit seed powder, Probioticated Mango beverage and Pomegranate juice were appreciated by the representatives from the Industry and they desired to have a wide range of such products to be developed without the addition of sugars, chemicals or preservatives.

The event provided an opportunity for interactions among the diverse stakeholders and some of the issues pointed above could be addressed on the spot through the networking of different stakeholders and the Research Institutes.

Industry also wanted to work in the PPP mode to develop solutions to the problems/ issues of societal interest.

Industry and Institutes may collaborate in areas like development and validation of bio-based suitable packaging material for fresh and fresh-cut fruits and vegetables and determination of correct maturity stage for fruits,



FOOD AND AGRICULTURE IN INDIA

Free Trade: Way Forward for Emerging Markets

Bhanu Pratap Singh Choudhary

Food trade versus food security has become a cause of worry for Emerging Markets (EMs) like India. Despite all the advances of achieving self-sufficiency in production, there are wide-spread inequalities that exist in India and are causing grave issues of hunger and malnutrition among a major chunk of its citizens. However, this is only one among the several challenges that are continuously faced by the EMs when it comes to their participation in the 'free trade' or liberalised trade regime in the world. In this article, I wish to touch upon the aspects that encourage the EMs participation in the liberalisation process and also try to enlist the challenges that lie ahead during the course of its journey towards the same.

Borrowing from the Ricardian thought of comparative advantage, classical economics has time and again reinforced its proposition of free-flow of trade and its relevance for prosperity. As some countries in the west industrialised, there was a need to expand markets and this led them to look for new markets in other countries. The result for the rapidly industrialised countries contained all the virtues of higher economic growth and the prosperity due to a rising working class, that participated in the manufacturing processes as suppliers of labour.

Over the years, this phenomena evolved into much larger themes of 'globalisation' and

'liberalisation'. Only a part of the tenure of these broad cyclical events of 'protectionism' and 'globalisation/ liberalisation' can be attributed to the institutionalised mechanisms under World Trade Organisation (WTO) in world history. However, considering the relative recency of such global institutions, these multilateral bodies have assumed greater significance for humanity, owing to the large-level participation by the majority of the countries in the world. Specially, after the replacement of the General Agreement on Trade and Tariffs (GATT) by WTO in mid 1990s, the turn of the century marked the beginning of a new era in the field of trade and its importance.

Introduction to Indian markets

Emerging markets like India have a huge presence of its working population in the primary sector i.e. agriculture. Even this huge chunk of population is largely composed of the small and marginal farmers, that have very less bargaining power and access to the formal markets and price realisations. Lots of distortions, opacity & power imbalances are influential in the market mechanisms in India. Similar instances could be deciphered in the other developing nations, and thus are classified alongside India as EMs. It is often argued that the Indian share in world trade is minuscule (around 2.1%) given the size of population (approx. 1.3 Billion) and an economic powerhouse it is (approx. 2 Trillion \$ growing at a faster rate among large economies).

Arguments in favour of free trade

Higher price realisation of food products in the DMs is often put forward as a primary argument for encouraging the trade. Along with some conflicting evidence (Salim, S. S., Safeena, P.

K., & Athira, N. R., 2015), there is a widespread consensus (Adhikari, A., Sekhon, M. K., & Kaur, M., 2016) on the better growth in price realisations through exports rather than selling in only domestic markets. Not even economic gains, there is evidence of the social welfare improvements (Meena et al., 2018) when the agricultural & food commodities are traded to the other countries.

Geetha, R. S., & Srivastava, S. K. (2018) find support to the argument that post-WTO, there has been considerable improvement in the stability of trade among countries on the front of various commodities. They also find that the short-supply due to low production of Maize in the domestic markets can also lead to scenarios where the domestic prices can effectively overshoot & exceed the world prices. In such cases, the export becomes impossible and a reverse flow might also be happening (through imports). Therefore, it is fair to consider the importance of a liberalised regime in reducing the uncertainties & risks associated with supply-led deficiencies in the biologically dependent food and agricultural commodities.

Quality convergence might prove to be a boon for the EMs that are interested in exporting the food and agricultural commodities to the DMs. Existence of Sanitary and Phytosanitary (SPS) and Technical Barriers to Trade (TBT) in most of the DMs can be seen as an opportunity for improvement rather than a challenge. Some evidence of improvements in quality of exported goods (Disdier, A. C., Gaigné, C., & Herghelegiu, C., 2018) has been put forward as an argument





for long term gains for competitiveness of these industries. This will ensure a long term participation in the export value chain by simultaneously improving the quality for domestic consumption also as learning effects might also play a role.

Low participation in world trade has considerably lowered the prospects of India coming to a position of being a super-power internationally. In order to gain and subsequently assert its prominence in the matters that concern the world, the EMs, particularly India is needed at the forefront with a better proportion of world trade. The rise of China as an important influencer of world politics has been possible only because of the aggressive effort in boosting manufacturing and then trade in such products.

The Free Trade Agreements (FTAs) are also instrumental in improving the Intra-Industry Trade (IIT). The original proposition of factor endowments by Heckscher Ohlin (HO) Model can be reinterpreted in terms of increased Vertical IIT in the industries e.g. the food processing sector of India. As shown in Varma, P. (2015), due to differences in the stages of processing or product differentiation, there is a higher VIIT & low HIIT between the countries. Thus, the structure of trade is largely dependent on the nature of the product and the stage of processing. In this line of argument, it is essentially arguable that the participation of EMs has a higher likelihood of starting at a lower level of processing, but in the subsequent years, possibilities of moving up the value chain can't be ignored.

Arguments against free trade

Apart from the Leontief paradox that was originally observed in the US, for higher imports of capital-intensive goods, as a case against the Heckscher-Ohlin Model, there is often a 'virtual water export' from EMs to DMs. This has been explained by study (Ngo et al., 2018; Xu, A. 2018) to have negative consequences for the exporter, as there is a rampant exploitation of natural resources by the EMs to supply the requisite commodity to the DMs. This is a central argument against the proposed free trade regime, as the resource constrained EM countries will face an acute crisis and that is indirectly caused by the lack of concern by the importing DMs.

Environment friendly logistics or 'green logistics' are emerging as a new non-tariff barrier for the EMs. In the name of creating sustainable development through improved practices, the burden of compliance is passed on to the EMs by the DMs. Whenever the importing countries have more stringent norms and regulations, there is evidence (Van Beers, C., & Van den Bergh, J. C. J. M. 1997) that suggests that stricter environmental regulations makes it more difficult to import commodities & goods from other countries. Also, as per the study done with trade flows from EMs to DMs by (Wang et al., 2018), it is seen that the export volumes significantly decline for the EMs when the environmental regulations are enforced by the DMs.

High inequality among the population of the EMs in terms of income, health and education is put forward as an argument to reflect the insufficient capacities to cater towards the demands of 'free trade'. Among various such demands, the challenge of 'food security' is a major competing trade-off against the 'free trade' of commodities. Huge stocks of food grains are kept as a buffer for feeding a large fraction of the population as a measure to mitigate the ill-effects of the pervasive scenarios of inequality. Food subsidies are thus, always at the target of the trade-promoting bodies like WTO. Indian experience with the Public Distribution System (PDS) that is a centrally sponsored scheme to ensure an almost universal coverage, is often at the centre of controversies. There might be various reasons for doubting the efficacy of the top-down approach, as has been the case with the Indian food security programs, like PDS, which emphasise subsidising the food for the poor through institutionalised procurement and subsequent disbursement to the poor households at subsidised rates. However, there is almost a consensus on the necessity of such programs in Indian scenario.

Conclusion

Free trade is allegedly designed to suit the big corporations of DMs in their endeavour to exploit the consumption aspirations of upward-moving & large human capital base of EMs. However, that assertion needs a lot of assumptions to be entirely the reason for pro-trade advocacy by the DMs. Again, at the same time, it is worth noting that the EMs like India have a host of challenges to overcome before it gears up for a full-fledged participation in the 'free trade' with the DMs. Most importantly, the issues around the inequality of wealth and income that translates to the poor health indicators of population makes it a priority for EMs like India to pay higher attention towards ensuring the food security of its inhabitants. In sum, this calls for the government to go urgently for enabling mechanisms towards a competitive domestic industry in EMs like India. This can potentially keep the products affordable, of reasonable quality & within-reach of its largely low-income population.

(About the author: Bhanu Pratap Singh Choudhary, FPM II, IIM Ahmedabad)



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