

Litchi processing

A promising value addition

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Fruit processing is often associated with high investment, deterring small farmers to take up value addition. ICAR with its simple technology and initial handholding support, has helped litchi farmers in Bihar achieve big dreams.

Talk to any litchi seller/ retailer, and chances are he isn't a litchi farmer. In the litchi heartland, Bihar, almost entire crop is sold to pre-harvest contractors who harvest the fruit and take litchi, profit included, across the length and breadth of the country. The farmers don't have to worry about marketing some might say, but there certainly are strong reasons why almost every litchi grower opts to give his crop to the middleman long before the fruits are harvested.

Unlike many other fruits, litchi harvesting is normally a one-time operation. The whole orchard is harvested in one go. Litchi has a short period of harvest that lasts a maximum of 15-20 days. Then there is the problem of pericarp browning - rapid change of fruit colour from red to brown. Harvested litchi fruit turns brown within 24-48 hours under normal environmental conditions. Litchi being an item of impulse buying, brown litchi fruit find no takers. Locally, the market gets flooded with the fruit resulting, very often, in glut and distress sale, while distant marketing becomes difficult due to highly perishable nature of the fruit and lack of appropriate postharvest logistics in place. Eventually, most litchi growers choose the easier

Chanda Kumari from SJMKPCL prepares litchi squash



option of striking deals with the pre-harvest contractor, although that comes at a high cost – low income.

Value-addition through processing - Intervention at ICAR-NRCL

Processing is one of the means to reduce postharvest losses and add value to fruit crops. Besides being nutritious, processed products are shelf-stable. They can be stocked and marketed over time, thereby, providing the processor with valuable time and advantage to market the products according to demand.

ICAR-National Research Centre on Litchi (NRCL), Muzaffarpur, Bihar has developed and standardized techniques for processing and preservation of litchi beverages. However, in an industry dominated by multi-national companies (MNC), need for initial high investment, and lack of funding and policy support, adoption of technology among stakeholders remained almost negligible.

Between 2014 and 2017, NRCL progressively introduced the positives of the technology during training programmes, Kisan melas, fairs etc. The centre also commenced manufacturing beverages on a pilot scale and marketed them to demonstrate feasibility of the technology as a viable business opportunity. Sensing interest among growers, the centre started an entrepreneurship development programme (EDP) on micro-processing of litchi beverages, whereby registered participants were made aware of the science behind beverage preservation, food safety regulation and licensing, storage and marketing. Once the trainees learnt that beverages could be prepared within the comfort of one's kitchen with minimal investment, the tide began to turn towards the end of 2018.

A few torch-bearers

Ram Sarovar, a 55-year-old farmer, from Kurhani block of Muzaffarpur could hardly earn a decent income from his 10 mango plants to meet family expenses. Convinced

Anoj Kumar Rai with his litchi and mango products in his farm at Pusa, Samastipur



Table: Increase in farm income from Shri. Anoj Kumar Rai litchi orchard through processing

Type of marketing	Fresh marketing	Processing	Gross income
Selling entire yield to middlemen (Traditional)	3000 kg	Nil	₹ 40,000/-
Processing part of yield (2020 experience)	2500 kg	500 kg	₹ 1,12,500/-
Processing entire yield	Nil	3000 kg	₹ 4,75,000/-

that processing could potentially take his family out of his plight, he learned the techniques of fruit processing at NRCL. Initially he started producing mango squash and RTS (ready-to-serve) products. Later, he began processing and marketing litchi pulp too by procuring litchi fruit from neighbouring farmers. Like every other place in the country, tilling and toiling in the fields is not an occupation today's youth prefer to take up, and Sarovar's son was no different. "I was worried about my educated-unemployed son, who was unwilling to take up agriculture as a profession. But once our litchi processing business started and profits began to come in, he has joined me full time", grins Mr. Sarovar about his 24-year-old son, Bharat Bhushan, who has since found his identity as a litchi processor and marketer with pride. In the year 2018, they re-invested their profits in purchasing a pulper of larger capacity. Today, their company, Ram Sarovar Agro Foods, markets litchi pulp to buyers across the country. The Sarovars also manufacture and supply litchi squash and RTS to retailers, restaurants and *dhabas*, and their flavourful-refreshing drinks can be found in retail shops along the highway from Muzaffarpur to Patna, catering to hordes of travellers along this route. Within three years, the Sarovars have gone from being first time processors to sourcing litchi fruit from nearby growers to match their growth and ambition.

If there is one quality that makes litchi stand out among fruits, it's the flavour – tropical and captivating. Its acceptance among consumers can be easily gauged from the popularity it finds in diverse products ranging from beverages, ice-creams and desserts, through home products like incense sticks to cosmetics such as lipsticks. Shri. Anoj Kumar Rai, 50, is another farmer from Samastipur who admits his childhood dream of exploring ways to process litchi for product diversification and earning higher income. "Litchi

is available for hardly one month. I want to process litchi so that the delightful flavour and health benefits of litchi can be provided to consumers throughout the year", says Anoj. His family owns 5 acres of land in Malikorh, an interior village in Samastipur, but he has not let poor accessibility to dampen his optimism. In May 2020, when COVID-19 was at its peak, marketing fresh litchi became problematic and risky. He was determined to transform the threat into opportunity. He says, "While litchi is highly perishable, the restrictions due to the nation-wide lockdown added to our woes. I decided that instead of giving up and counting my loss, I should process the fruit and preserve the pulp". With technical supervision of NRCL, Mr. Anoj not only saved his crop but also kickstarted his tryst with fruit processing. His 60 odd litchi trees would hardly earn him ₹ 40,000 through deals with middlemen. During the summer of 2020, he was able to earn a gross income of ₹ 79,200 by processing 500 kg, harvested from 10 trees, into RTS beverage. With success in litchi processing, he replicated the same with "Mallika" mango. Today his products are being marketed locally. Like Mr. Sarovar, he also targets restaurants, retail outlets, and catering houses in Pusa and Samastipur. Mr. Anoj's passion to agri-innovate deserves praise and mention, and is a fine example of success under trying circumstances. His 5-acre plot has different fruit plants – litchi, mango, apple, peach, plum, kinnow, mandarin, lime, grape, jamun, aonla and many more, collected from his visits to different agricultural universities and research institutes all over the country. Mr. Anoj plans to bring maximum share of his varied produce under processing. Seeing his success, nearby farmers have come together to join Mr. Anoj, and formed what they have christened *Pusa Farmers Producer Company*.

Samarpan Jeevika Mahila Kisan Producer Company Limited (SJMKPCL), a group located at Jhapaha, Muzaffarpur (Bihar) works among women farmers with the vision of improving social and economic status of farmers through technological and marketing interventions. Fruit and vegetable processing being one of the components of increasing income, the company came forward and attended the EDP at ICAR-NRCL in early March 2020. About 20 tons of litchi pulp was processed during the ensuing litchi season in May-June. With the knowhow gained from the EDP, the company gradually commenced manufacturing litchi squash and



Workers collecting bunched fruits for packaging

RTS. The group further plans to diversify the product range and increase quantum of processing in coming seasons to leverage the litchi value chain and, thereby, improve livelihood of farmers.

While such success stories can be considered as baby-steps or at best morsels in the huge platter of food processing industry, the winds of change are real and encouraging. There is optimism and interest among small and marginal farmers in fruit processing, and rightly so. *Shahi Litchi* of Bihar has been registered as GI (Geographical Indication) that assures quality and distinctiveness attributed to its area of production in Bihar. This has been followed up by the selection of litchi for three districts of Bihar *viz.* Muzaffarpur, East Champaran and Sitamarhi, in the One District One Product (ODOP) programme under PMFME scheme of

the MOFPI. These factors are expected to give much-needed fillip to increasing processing avenues under litchi.

Influencing factors

Some of the reasons that were instrumental in bringing success to the likes of Ram Sarovar and Anoj Rai are as follows.

Processing in one's own kitchen

A misconception that limits technology adoption is the notion that processing requires huge investment. It is the sole reason which prevents farmers to take up processing on farm. Success in grooming small and marginal farmers to be entrepreneurs and first-time processors lies in convincing that their home (kitchen) could be their

processing unit. To achieve this, training and capacity building on micro-level processing techniques becomes vital, *i.e.*, providing scientifically sound hands-on experience/training on food processing which learners can replicate in their homes. As Akhilesh, another budding processor from Muzaffarpur, says, *“I have an orchard with different fruits, and big dreams too. But before I make haste to do something big, I need to know the basic principles of fruit preservation and be able to come up with a product that sells”*.

Institutional support

From providing technical skills and infrastructural facilities to mentoring small businesses in every step, institutional support goes a long way in nurturing first time processors. Agri-business incubation (ABI) units and Transfer of Technology (ToT) sections in public institutions such as ICAR, KVKs, Agricultural Universities etc., take care of incubating small businesses and start-ups in agriculture, including food processing. At ICAR-NRCL, under the EDP, post-training participants are provided access to laboratory equipment for product development with all possible technical guidance. The centre's postharvest workshop and processing facilities are provided to incubatees on custom-hiring basis. The incubatees are also mentored for marketing their products and other mandatory certification including FSSAI licence. All these go on to show the importance of hand-holding farmers to mitigate risk of failure in processing.

Dream big, start small

It is one thing to dream, quite another to translate that into reality. The food industry is dominated by several big MNCs, and it is no mean task to stay competitive and successful. Before deciding to invest big, it is important for any micro-processor to develop a product and test for market and consumer acceptance. Only after the processor is convinced that the product would sell should he make the decision of investing more. Without a product that sells, big investment would put businesses into jeopardy and risk of heavy losses. As Anoj puts it, *“My plan is to start small and process as per local market demands. I will make effort to popularize my products and expand my marketing niche. I plan to expand and invest commensurating with my business growth.”*

Conclusion

Viable business and promising opportunities lie in litchi processing. Processing can be an important tool to nullify the threat and risk associated with marketing of fresh litchi. Entrepreneurship and business growth through fruit processing also lifts other related industries such as packaging, food ingredients, water purification, logistics and warehousing, E-commerce etc. A few micro-processors in litchi have emerged in and around Muzaffarpur in recent years. With Shahi litchi already GI registered and the present institutional support in the form of PMFME scheme, the future in processing appears bright. Besides, the same preservation techniques can be employed to process other fruit and vegetables that are seasonally available throughout the year.

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