

Coconut chips – A crispy innovation in value addition

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Coconut is used in preparation of many products, including copra, coconut oil, virgin coconut oil, desiccated coconut, coconut milk, coconut water, coconut sugar, coconut flour, tender coconut beverages, and several confectionery products. Coconut chips represent an innovative non-fried, ready-to-eat snack with growing consumer acceptance. The technology has considerable commercialisation potential for farmer producer organisations, self-help groups, rural entrepreneurs, and micro-enterprises. Growing consumer preference for nutritious convenience foods, coupled with increasing domestic and export demand for premium coconut products makes coconut chips a promising value-added enterprise.

Keywords: Coconut value added products, Export potential, Farmer producer organisations

COCONUT (*Cocos nucifera* L.), popularly known as the 'Tree of Life' or *Kalpavriksha*, occupies a unique place in Indian agriculture due to economic value of every part of the palm. Beyond its traditional cultural and culinary significance, coconut has emerged as an important raw material for the development of high-value food products that cater to changing consumer preferences. Traditionally, mature coconuts have been utilised for household consumption, copra production, edible oil extraction, and preparation of conventional food products. However, fluctuations in market prices, increasing production costs, fragmented landholdings, and changing consumer demands have encouraged greater emphasis on value addition and product diversification. Developing innovative coconut-based products not only improves the profitability of coconut farming but also creates employment opportunities, reduces post-harvest losses, and strengthens the competitiveness of the coconut sector.

With urbanisation, increasing health awareness, and changing

lifestyles, the market has considerably expanded for convenient, ready-to-eat foods. This shift has created substantial opportunities for developing innovative coconut-based snack products capable of serving both domestic and export markets. Among the various value-added products developed from coconut, coconut chips have emerged as one of the most promising innovations in view of their appealing texture, flavour diversity, convenience, and commercial potential.

ICAR-Central Plantation Crops Research Institute (ICAR-CPCRI), Kasaragod, has developed standardised technologies for hygienic commercial production of coconut chips and the associated processing machinery required for mechanised production. Through technology licensing, training programmes, incubation support, and entrepreneurship development initiatives, the institute has enabled farmer producer organisations (FPOs), self-help groups (SHGs), women entrepreneurs, start-up enterprises, and small-scale processors to establish profitable

coconut chip production units.

Need for value addition in coconut

India produces a wide range of coconut-based products, including copra, coconut oil, virgin coconut oil, desiccated coconut, coconut milk, water, sugar, and flour, tender coconut beverages, and several confectionery products. Value addition enables producers to convert raw agricultural produce into diversified products with higher market value, improved shelf life, wider consumer acceptance, and better profitability (Indian Food Industry Magazine, 2013). Simultaneously, there is a growing demand for minimally processed foods prepared using technologies that preserve product quality while reducing dependence on deep frying and excessive oil.

Coconut chips represent one such successful value-added product developed through ICAR-CPCRI technology. Unlike conventional banana, potato and tapioca chips, coconut chips are produced through osmotic dehydration followed by controlled hot-air drying instead of deep-fat frying. This processing

method produces a crisp, ready-to-eat snack while retaining the characteristic flavour and texture of coconut kernel. The technology also provides flexibility for developing several flavoured variants, including vanilla, pineapple, strawberry, tomato, masala, jaggery-based, and coconut sugar-based products to meet diverse consumer preferences.

Beyond improving farm income, coconut chips production offers significant opportunities for rural entrepreneurship. Small-scale processing units can be established by FPOs, women SHGs, start-up enterprises, and rural youth using commercially available processing equipment.

Coconut chips technology

Coconut chips are a premium value-added snack prepared from mature coconut kernels through a combination of osmotic dehydration and controlled hot-air drying. Recognising the need for profitable value addition in the coconut sector, the ICAR-CPCRI, Kasaragod, has standardised an integrated technology package for commercial production of coconut chips. In addition to the processing protocol, the institute has

developed mechanised equipment including coconut dehuskers, deshellers, testa removal machines, and slicers, enabling hygienic, efficient, and commercial-scale processing. Through technology licensing, entrepreneurship training, incubation support, and technical guidance, ICAR-CPCRI has facilitated the establishment of coconut chip enterprises by individual entrepreneurs, FPOs, SHGs, and small-scale food processors.

The standardised technology ensures uniform product quality, improved processing efficiency, and enhanced consumer acceptability while minimising manual labour.

Process protocol for coconut chip production

- The production of coconut chips begins with the selection of healthy, mature coconuts of approximately 9–10 months maturity, possessing medium-thick kernels suitable for slicing.
- Freshly harvested nuts are mechanically dehusked and deshelled using equipment developed by ICAR-CPCRI.
- The brown testa is then removed to obtain clean white coconut

kernels. Mechanical processing improves operational efficiency, reduces labour requirements, and maintains product hygiene throughout production.

- The kernels are sliced uniformly into thin sections ranging between 0.5 and 1.0 mm thickness using a multi-commodity slicer. Uniform slice thickness is essential for achieving consistent drying, desirable crispness, and attractive appearance.
- Immediately after slicing, the coconut pieces are washed thoroughly in potable water to remove adhering particles and maintain product cleanliness.
- The washed slices are subsequently subjected to blanching at 90–95°C for approximately two minutes. Blanching serves multiple purposes, including enzyme inactivation, reduction of microbial load, improvement of colour retention, and enhancement of the overall appearance of the finished product. This pre-treatment also contributes to uniform drying during subsequent processing stages.



- Following blanching, the slices undergo osmotic dehydration, an important pre-treatment that improves flavour, texture, and drying efficiency. The coconut slices are immersed in approximately 45°Brix sugar syrup containing salt and flavouring agents for about 30–45 min. Osmotic dehydration removes a portion of the water from the tissue while allowing controlled uptake of soluble solids, thereby enhancing sweetness, improving texture, reducing drying time, and increasing consumer acceptability. ICAR-CPCRI has also standardised the use of jaggery and coconut sugar as alternative osmotic agents for developing innovative coconut chip variants with improved consumer acceptability (ICAR-CPCRI, 2021).
- The osmotically treated slices are then arranged on drying trays and dried in a hot-air tray dryer at approximately 65–70°C. Under optimised processing conditions, drying requires nearly six hours to produce chips with the desired crispness and shelf stability (ICAR-CPCRI, 2026). Controlled drying removes moisture uniformly while preserving product colour,

texture, and flavour. After drying, the chips are cooled to room temperature and packed immediately in moisture-proof laminated pouches to prevent moisture absorption and maintain crispness during storage. Appropriate packaging also extends shelf stability and preserves product quality during transportation and marketing.

Nutritional and functional attributes

Coconut chips are prepared from mature coconut kernel, which naturally contains dietary fibre, phenolic compounds, tocopherols, carbohydrates, minerals, vitamins, and medium-chain fatty acids that contribute to its nutritional quality. Coconut chips can therefore be positioned as a premium ready-to-eat snack for consumers seeking diversified coconut-based products. Recent reviews have reported antioxidant, antimicrobial, cardioprotective, neuroprotective and metabolic health-promoting properties of coconut and its derivatives, although much of the available evidence originates from experimental and pre-clinical studies. Therefore, coconut chips should be promoted primarily as a nutritious coconut-based snack rather than as a therapeutic food. Further well-designed human clinical studies are required before definitive health claims can be established.

Economics of coconut chip production

Compared with the marketing of raw coconuts, value addition

substantially enhances product value, improves shelf life, and opens access to premium retail markets. The economics of production depend on the cost of raw materials, labour, utilities, packaging materials, flavouring ingredients, and equipment depreciation.

Entrepreneurship opportunities

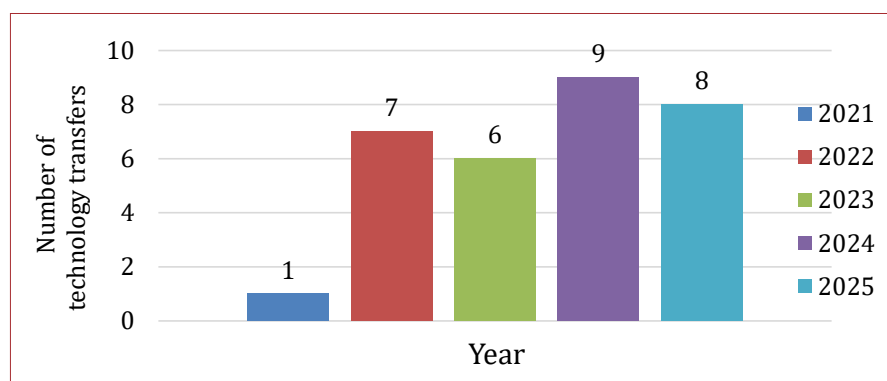
Coconut chips offer an attractive entrepreneurial opportunity because the technology is relatively simple, requires moderate investment, and can be implemented at the village or cluster level. ICAR-CPCRI has played a significant role in promoting entrepreneurship through technology licensing, skill development programmes, incubation support, demonstration units, and technical guidance. Entrepreneurs receive training in raw material selection, hygienic processing, quality control, packaging, branding, storage, and business management, enabling them to establish commercially viable processing units. As of July 2026, ICAR-CPCRI has transferred the coconut chips technology to 75 entrepreneurs across India. Apart from direct income generation, coconut chip enterprises create employment opportunities in coconut procurement, processing, packaging, transportation, retail marketing, digital commerce, and value-chain services. Such decentralised enterprises contribute to strengthening rural economies while providing additional income opportunities for coconut-growing households.

Table 1. Indicative cost components for production of 1 kg coconut chips*

Particular	Approximate value
Mature coconuts required	10–12 nuts/kg chips
Production cost	₹350–400/kg
Selling price	₹600–800/kg
Gross profit	₹200–400/kg
Profit margin on selling price	≈42–50%
Small unit capacity	25 kg/day
Annual income potential	₹3–4 lakh
Initial investment	₹2.0–2.5 lakh
Payback period	1–1.5 years

*Values are indicative and may vary depending on raw material prices, production scale, labour charges, packaging specifications, and local market conditions.

Source: ICAR-CPCRI.



Transfer of ICAR-CPCRI coconut chip technology (2021–25)
(Source: ICAR-CPCRI)

Table 2. Comparison of popular snack chips

Parameter	Potato chips	Tapioca chips	Coconut chips
Processing method	Deep frying	Deep frying	Osmotic dehydration followed by hot-air drying
Oil content	High	High	Low (non-fried)
Dietary fibre	Moderate	Moderate	Naturally present in coconut kernel
Medium-chain fatty acids	Absent	Absent	Naturally present
Product diversification	Limited	Limited	Multiple flavour variants
Shelf stability	Moderate	Moderate	Good with moisture-proof packaging
Market positioning	Conventional snack	Traditional snack	Premium value-added snack



Different flavour variants of commercially packaged coconut chips

Market potential and consumer acceptance

Consumer demand for ready-to-eat and value-added snack products is increasing in India. Although potato, banana, and tapioca chips continue to dominate the market, consumers are increasingly

seeking innovative snack products that combine convenience with premium quality and distinctive taste. Coconut chips have emerged as one such product with significant commercial potential. Attractive packaging, longer shelf stability, and ease of transportation further

improve marketability through supermarkets, specialty food stores, tourist outlets, online retail platforms, and institutional buyers. The increasing demand for vegan foods, minimally processed snacks, and premium packaged products also presents opportunities for coconut chip manufacturers to target health-conscious consumers.

Export prospects of coconut chips

India is one of the leading producers of coconut and possesses a well-established export infrastructure for coconut-based products. Markets in the Middle East, Europe, North America, and Southeast Asia have shown increasing interest in innovative coconut products owing to changing dietary preferences and the popularity of tropical food products.

The availability of diversified flavour options, improved packaging technologies, and standardised processing protocols enhances the export potential of coconut chips. However, successful participation in export markets requires strict adherence to food safety standards, hygienic manufacturing practices, quality assurance systems, attractive packaging, and compliance with importing-country regulations. Development of geographical branding, product certification, and

Case study:

From retiree to successful entrepreneur

Mrs. T.M. Annamma of Parakkatta, Kasaragod, Keralam, transformed her post-retirement aspirations into a successful food processing enterprise by licensing the ICAR-CPCRI Coconut Chips Production Technology in March 2024. She established Bless Farm Flave, commencing commercial production in July 2024 and officially launching the enterprise in September 2024. Her enterprise currently provides employment to six persons, including four women, while marketing products through the OSOP Stall at Kasaragod Railway Station, Amazon, and local retail outlets. She is operating the sales outlet in CPCRI premises. She sells the products to the worth of ₹6.5 lakhs/yr.



To strengthen the enterprise, Mrs. Annamma availed financial assistance under the PMFME Scheme, receiving ₹3.00 lakh loan, ₹1.33 lakh subsidy, and an additional ₹3.45 lakh grant from the local panchayat. She has also diversified into coconut water squash using another ICAR-CPCRI technology. The success of this enterprise demonstrates the commercial viability of coconut chips as a profitable value-added product capable of generating employment and enhancing income for rural entrepreneurs.



participation in international trade fairs can further strengthen export opportunities for Indian coconut chip manufacturers.

Government support for coconut-based enterprises

Several government agencies actively promote coconut value addition, food processing, and rural entrepreneurship. The Coconut Development Board (CDB) supports technology dissemination, entrepreneurship development, market promotion, and capacity-building programmes for coconut growers and processors. Financial assistance and credit support are also available through institutions such as commercial banks, and state government agencies for establishing small-scale food processing enterprises.

Entrepreneurs can also benefit from schemes under the Pradhan Mantri Formalisation of Micro

Food Processing Enterprises (PMFME) programme and Agri Infrastructure Fund (AIF), which encourage establishment and modernisation of micro-food processing units through credit-linked subsidies, technical support, and entrepreneurship development. Such initiatives complement the technology licensing and incubation support provided by ICAR-CPCRI, thereby facilitating wider adoption of coconut chip production across coconut-growing regions.

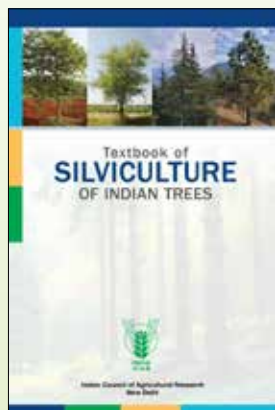
SUMMARY

Coconut chips represent an innovative value-added product that combines scientific processing technology with emerging market opportunities for the coconut sector. The standardised technology developed by ICAR-CPCRI enables the production of high-quality, ready-to-eat coconut chips through osmotic dehydration and controlled

hot-air drying, offering an attractive alternative to conventional fried snack products. Successful enterprise development, however, depends on maintaining hygienic processing practices, standardised production protocols, quality packaging, and compliance with food safety regulations. Continued technology dissemination, entrepreneurship training, institutional support, and market linkage development will facilitate wider adoption of coconut chip production and strengthen the coconut value chain. With appropriate technical guidance and business planning, coconut chips can contribute significantly to sustainable livelihood improvement, value addition, and the economic development of coconut-growing regions in India.

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TECHNICAL ASPECTS

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