

Value addition in goat milk: Exploring cheese-making as a rural livelihood strategy

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Goats play a vital role in India's livestock economy, particularly for small and marginal farmers in arid and semi-arid regions. While goat meat remains the primary product, goat milk presents significant untapped potential for value addition, especially in cheese-making. It is known for high nutritional value, easy digestibility, and suitability for individuals with lactose intolerance or special dietary needs, goat milk offers a unique opportunity to diversify rural incomes. Transforming goat milk into cheese can unlock new income streams, bolster rural employment, and cater to the rising demand for functional and premium dairy products. Promoting goat cheese production can significantly improve livelihoods, empower rural communities, and advance India's dairy sector by optimising resources and nurturing rural entrepreneurship.

Keywords: Dairy entrepreneurship, Goat cheese, Pastoralism, Rural enterprise

GOATS play a crucial role in livestock sector of India, particularly for small and marginal farmers in arid and semi-arid regions. While cattle and buffaloes have traditionally dominated, goats have exhibited significantly higher growth because of their nutritional value and consumer preference. Between 2012 and 2019, the goat population in India increased by 10.14%, rising from 135.17 million to 148.88 million, whereas cattle and buffalo populations registered only marginal growth of 1.34% and 1.06%, respectively. Long-term trends from 1951–2019 further indicated that goats showed the highest population growth rate (9.49%) among major livestock species, highlighting their greater adaptability, resilience under diverse agro-climatic conditions, and increasing market demand for goat meat and milk. In India, goats are primarily reared for meat (mutton or chevon), with milk as a secondary product. Although cattle and buffalo milk dominate the dairy sector, contributing over 94% of total milk production, alternative milk

sources such as goat milk are gaining attention due to their nutritional and functional properties.

India is currently the world's largest producer of goat milk, with Rajasthan, Uttar Pradesh, Madhya Pradesh, Gujarat, and Maharashtra contributing nearly 79.5% of total production. Goat milk production in India increased from 6.09 million tonnes (mt) in 2018–19 to 8.22 mt in 2024–25, registering an overall growth of 34.98% during the period. Goat milk accounted for 3.23% of the country's total milk production in 2024–25, reflecting the growing importance of the goat sector in India's dairy economy (BAHS 2025). Traditionally, goat milk is largely consumed at the household level by small-scale rearers and pastoralist communities such as the *Raika* in Rajasthan and the *Rabari* and *Bharwad* in Gujarat, who maintain sizeable herds. A significant portion of the milk is channelled through informal systems, where it is collected by private dairies or cooperative primary milk collection centres, often mixed with cow or

buffalo milk, and processed for commercial use.

Goat milk has slight nutritional and functional advantages over cow milk, with higher fat (3.8%), protein (3.4%), and mineral content, contributing to better nutritional value. Its lower lactose content (4.1%) and distinct protein profile with lower α_{s1} -casein improve digestibility and reduce allergenic potential compared to cow milk. Although both have similar energy values, goat milk's higher non-protein nitrogen content and better gastrointestinal tolerance make it a promising functional dairy alternative for specialised nutrition and value-added dairy products.

Women constitute a vital component of goat-based production systems, undertaking key responsibilities such as animal care, fodder collection, manure management, and the management of young and pregnant animals. Their substantial involvement in these labour-intensive and often non-remunerative activities underscores their critical contribution to

Table 1. Average composition of basic nutrients in goat milk and cow milk

Particulars	Goat milk	Cow milk
Fat (%)	3.8	3.6
Solid Not Fat (SNF) (%)	8.9	9.0
Lactose (%)	4.1	4.7
Protein (%)	3.4	3.2
Casein (%)	2.4	2.6
Non-protein nitrogen (%)	0.4	0.2
Ash (%)	0.8	0.7
Calories/100 mL	70	69

Source: Park *et al.* (2007)

rural livelihoods and livestock management. In recent years, goat milk has gained recognition as a functional food owing to its rich nutritional composition, including lactose-based oligosaccharides, short- and medium-chain fatty acids, essential minerals and bioactive compounds such as conjugated and branched-chain fatty acids. This has driven the emergence of niche markets for goat milk and its value-added products across health-oriented sectors, including Ayurveda, pharmaceuticals, and functional foods.

Products such as flavoured milk, probiotic yoghurt, artisan cheese, and ice cream are gaining traction, offering significant opportunities for value addition and income diversification. The growing demand for goat milk and its derivatives, coupled with increasing



Panchal Dairy at Shark Tank 2025

export potential, is encouraging the development of commercial dairy goat farming in India. Promoting entrepreneurship, strengthening value chains, and establishing market linkages will be essential to fully harness this potential, thereby enhancing rural livelihoods, generating employment, and supporting sustainable agricultural development.

Goat cheese

Goat cheese is increasingly recognised as a nutritionally valuable and functionally distinct alternative to cheese derived from cow milk. Its relatively lower lactose content and smaller fat globule size contribute to improved digestibility, making it suitable for individuals with mild lactose intolerance or sensitivity to

conventional dairy products. From a nutritional perspective, goat cheese provides high-quality protein, essential minerals such as calcium and phosphorus that support bone health, and trace elements including selenium and zinc, which play important roles in immune function and oxidative stress regulation. In addition, its lipid profile, characterised by short- and medium-chain fatty acids, enhances metabolic efficiency and contributes to its growing acceptance among health-conscious consumers.

Globally, goat cheese occupies a well-established niche within the dairy sector, particularly in countries such as France, Spain, and Greece, where a wide range of artisanal and commercial varieties are produced. In recent years, demand has expanded in regions including North America, Australia and parts of Asia, driven by increasing consumer preference for specialty dairy products, dietary diversification, and the rising popularity of alternative and functional foods. This trend is reflected in market projections with the global goat cheese market valued at USD 12.45 billion in 2024 and expected to reach USD 17.34 billion by 2034, growing at a compound annual growth rate of 3.4%. In India, goat cheese remains an emerging segment within the broader dairy industry. Small-scale dairies and artisanal producers, particularly in states such as Maharashtra, Gujarat, and Tamil Nadu have begun exploring



Fresh goat cheese preparation



Various types of goat cheese



Packing of 150 g Feta goat cheese

the production of varieties including chevre, feta, halloumi, and tomme. However, the sector continues to face several structural constraints, including low and seasonal milk availability, limited consumer awareness, and inadequate cold-chain and processing infrastructure. Despite these challenges, a gradual increase in demand is observed among urban consumers, gourmet food segments, and health-focused markets. The development of goat cheese production presents significant opportunities for value addition and income diversification, particularly for smallholder farmers and pastoralist communities who traditionally rely on goat rearing. A large proportion of goat milk in India is currently consumed at the household level or marketed through informal channels at relatively low prices. Converting this milk into higher-value products such as cheese can enhance economic returns, generate rural employment, and support inclusive growth, especially for women

engaged in livestock management. Strengthening market linkages, promoting entrepreneurship, and facilitating investments in processing, storage, and distribution infrastructure will be critical to realising the full potential of this sector.

Success story of Panchal Dairy enterprise

Arpan Kalotra and Bhimsinh Ghanghal, from Rabari Maldhari (pastoralist) families in Gujarat, grew up witnessing a gradual decline in traditional livestock-based livelihoods as many youths migrated to urban areas. Motivated to create local opportunities and sustain their cultural heritage, they began their entrepreneurial journey in 2019 through an initiative by Sahjeevan (NGO) that encouraged Maldhari youth to explore small enterprises. Starting with a modest investment of ₹500, they experimented with small-scale trading activities, which helped them understand local markets and build entrepreneurial confidence.

Their interest shifted towards dairy during a learning visit to Anand, where they identified cheese as a high-potential product due to its longer shelf life and premium market value. With technical guidance from a cheese-making expert associated with Kase cheese, they began experimenting with artisanal goat cheese using locally available milk. Through continuous learning and small-batch trials, they developed skills in cheese-making, including flavour infusion and ageing techniques. In 2021, they formally established 'Panchal Dairy' with an initial investment of approximately ₹8 lakhs, converting a room in their home into a small processing unit. Milk was sourced from local *Rabari* and *Bharwad* pastoralists, creating a community-based supply chain. Despite initial skepticism and slow market response, they gradually built consumer acceptance through product demonstrations, improved packaging, and participation in local markets. Over time, Panchal Dairy diversified its product portfolio to include a range of goat and sheep milk cheeses such as chevre, feta, halloumi, tomme, and ricotta. The enterprise currently processes around 100 L of milk daily, primarily sourced from local pastoral communities and generates annual revenue of ₹7 lakhs. Their focus on artisanal production, hygiene, and branding has enabled them to establish a niche presence in urban and premium markets, including business-to-business linkages with



Foreigners visit to Panchal Dairy



Presentation by Panchal Dairy at cultural festivals

specialty cheese distributors.

Table 2. Economic indicators of Panchal Dairy

Parameter	Value
Initial investment	₹8 lakhs
Daily milk processing	~100 L
Goat milk share	~70%
Cheese production (Total Sold)	~1,200 kg
Annual revenue	~₹7 lakhs
Cost of production (per kg)	₹950
Selling price (per kg)	₹1,250
Benefit-cost ratio	1.32

The enterprise has gained national and international recognition through participation in events such as Dastkari Haat, Living Lightly, and the Jaipur Literature Festival, as well as at the World Cheese Awards. Their appearance on Shark Tank India (2025) further expanded their visibility and market reach. In addition to product sales, they have introduced cheese tours and workshops in Sayla, attracting tourists and culinary learners. Panchal Dairy demonstrates the potential of value addition in

livestock-based systems by linking traditional pastoral practices with modern entrepreneurship. The initiative has contributed to income diversification, local employment generation, and increased economic returns for pastoral households supplying milk. It also highlights the importance of community participation, skill development, and market-oriented innovation in revitalising rural livelihoods. Looking ahead, the founders aim to scale their operations through expanded production capacity, product innovation, and the establishment of an experience centre to promote pastoral culture and artisanal dairy practices. Their journey reflects how localised, community-driven enterprises can create sustainable livelihood opportunities while preserving traditional knowledge systems.

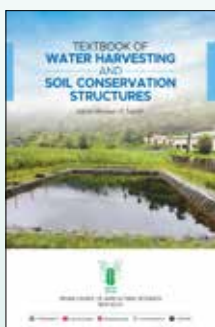
SUMMARY

Goat cheese production in India presents a valuable opportunity to enhance rural livelihoods, particularly among pastoralist and smallholder communities. Despite being the world's largest

producer of goat milk, India has yet to fully utilise this resource for high-value dairy products. Goat cheese, known for its health benefits and growing global demand, can offer a sustainable income source, especially in regions like Rajasthan and Gujarat, where goat rearing with large flock size is widespread. By shifting from basic milk sales to value-added processing, rural families can access better markets, generate employment, and reduce income insecurity. Additionally, goat cheese aligns with the rising consumer interest in health-conscious, lactose-free, and gourmet food options. With proper support in terms of awareness, infrastructure, training, and market access, India can develop a strong domestic and export-oriented goat cheese sector. This transformation can contribute not only to economic upliftment but also to the preservation of traditional pastoral practices and local food systems.

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TECHNICAL ASPECTS

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