

Litchi: A Nutrient-Rich Fruit for Better Health and Nutrition Security

Litchi (*Litchi chinensis* Sonn.), popularly known as the 'Queen of Fruits', is a nutrient-rich subtropical fruit with significant potential to enhance nutrition and health in India. It is normally consumed as fresh or processed and has become one of the most popular fruits because it has a delicious flavor, attractive color, and high nutritive value. Whole litchi fruits have been used not only as a food source but also for medicinal purposes. The health benefits of litchi have been attributed to its wide range of nutritional components, among which polysaccharides and polyphenols have been proven to possess various beneficial properties. Regular consumption of litchi supports immunity, cardiovascular health, digestion, and overall well-being. The fruit also plays an important role in addressing hidden hunger by improving dietary diversity and micronutrient intake. In addition, litchi by-products offer scope for nutraceutical and value-added applications. With its increasing availability and acceptance, litchi is emerging as a nutrition-smart fruit, contributing to improved public health and supporting nutrition-sensitive horticulture in India.

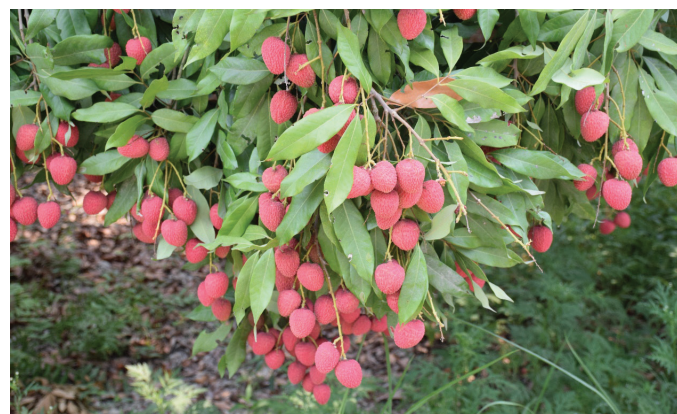
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HORTICULTURAL crops are now acknowledged as key drivers of nutritional security, particularly in developing countries like India where micronutrient deficiencies remain widespread. In this context, fruits serve not only as sources of income but also as essential components of a balanced and healthy diet. Litchi stands out as a promising fruit crop that combines taste with nutrition and health benefits. Its bright red skin, juicy translucent pulp, and distinct sweet flavour make it one of the most relished summer fruits in India. Beyond its sensory appeal, litchi is increasingly recognized as a nutrition-rich and health-promoting fruit, contributing significantly to improved dietary quality and well-being. India is the second-largest producer of litchi globally,

with major cultivation concentrated in Bihar, followed by Jharkhand, Uttar Pradesh, and West Bengal. In recent years, driven by its remunerative returns and increasing demand, litchi cultivation is expanding into non-traditional regions such as Rajasthan, Himachal Pradesh, Madhya Pradesh, Punjab, as well as southern states and North Eastern India. This expansion is improving the availability of this nutrient-rich fruit and strengthening its role in nutrition-sensitive agriculture.

Nutritional richness: A natural source of energy and vital nutrients

Litchi is a refreshing summer fruit with high moisture content (about 80–82%), making it highly effective in



Attractive bunches of litchi cultivars 'Shahi' and 'Chinda', highlighting their distinct colour

maintaining hydration during hot weather. The fruit pulp contains natural sugars such as glucose, fructose, and sucrose, which provide quick and easily digestible energy. One of the most important nutritional attributes of litchi is its high vitamin C content, which plays a crucial role in enhancing immunity and protecting the body against infections. The fruit also contains B-complex vitamins such as thiamine, riboflavin, and niacin, which are essential for metabolic functions. Litchi is a good source of minerals including potassium, magnesium, calcium, phosphorus, and iron. Additionally, the presence of dietary fiber contributes to improved digestion and gut health. Beyond basic nutrients, litchi is rich in bioactive compounds such as flavonoids, phenolic acids, and anthocyanins. A unique compound, oligonol, derived from litchi polyphenols, enhances its functional value.

Table 1. Nutritional composition of litchi per 100 g fresh fruit

Moisture	71.11-84 g	Niacin (Vitamin B ₃)	1.1 mg
Carbohydrate	15-89 g	Ascorbic acid (Vitamin C)	15 – 60 mg
Protein	0.7-4.12 g	Calcium (Ca)	4 – 4.90 mg
Fat	0.1-3.75 g	Phosphorus (P)	25 – 35 mg
Fiber	1.3 g	Potassium (K)	140 – 180 mg
Thiamine (Vitamin B ₁)	0.02 mg	Copper (Cu)	0.17 – 0.23 mg
Riboflavin (Vitamin B ₂)	0.07 mg	Zinc (Zn)	0.16 – 0.28 mg

Health benefits: A functional fruit for modern lifestyles

Litchi, often regarded as a functional fruit, offers a wide range of health benefits due to its rich composition of nutrients and bioactive compounds. The fruit is an excellent source of vitamin C, which plays a vital role in strengthening the immune system and protecting the body against infections. Regular consumption of litchi helps enhance the body’s natural defense mechanisms, making it particularly beneficial in maintaining overall health. In addition, litchi is rich in polyphenols and other antioxidants that help neutralize harmful free radicals in the body. This antioxidant activity reduces oxidative stress and protects cells from damage, thereby lowering the risk of chronic diseases. The presence of potassium and flavonoids further contributes to heart health by helping regulate blood pressure and improving overall cardiovascular function.

Litchi also exhibits anti-inflammatory properties, as its bioactive compounds help reduce inflammation associated with various lifestyle disorders. Compounds like oligonol have been reported to support metabolic health by aiding in the regulation of blood sugar levels and reducing fat accumulation. Moreover, the dietary fiber present in litchi promotes healthy digestion, supports gut function, and helps prevent constipation. The protective effects of litchi extend to vital organs as well. Its antioxidant constituents are known to support liver health and may

play a role in reducing the risk of neurodegenerative disorders. Overall, these health-promoting properties highlight the importance of litchi in managing lifestyle-related conditions such as hypertension, diabetes, and cardiovascular diseases, making it a valuable addition to modern diets.

Role in combating hidden hunger

Micronutrient malnutrition, commonly termed 'hidden hunger', continues to pose a serious public health challenge in India, particularly among children, women, and other vulnerable groups. Despite adequate calorie intake, deficiencies of essential vitamins and minerals often lead to impaired immunity, poor growth, and increased susceptibility to diseases. In this context, litchi emerges as a valuable fruit with the potential to contribute meaningfully toward improving nutritional security. Litchi is a rich source of vitamin C, along with important minerals and bioactive compounds that support better nutrient absorption and overall metabolic functions. Regular inclusion of litchi in the diet can enhance dietary diversity, which is a key strategy in addressing micronutrient deficiencies. Its refreshing taste, appealing appearance, and ease of consumption make it especially suitable for promoting fruit intake among children.

Furthermore, incorporating litchi into daily diets—either as fresh fruit or in processed forms—can help bridge nutritional gaps in resource-limited settings. For women, particularly during pregnancy and lactation, improved intake of micronutrients through fruits like litchi can support better health outcomes. At the community level, promoting litchi cultivation and consumption can complement ongoing nutrition-sensitive horticulture initiatives aimed at combating malnutrition. Thus, litchi holds significant promise as a nutrition-smart fruit that not only enriches diets but also plays an important role in reducing hidden hunger and improving overall public health in India.

Functional and nutraceutical potential: Recent research has highlighted that not only the edible portion (aril) but also the by-products of litchi possess significant functional and nutraceutical value. The peel (pericarp) and seeds, which are often discarded as waste, are rich sources of bioactive compounds, particularly antioxidants such as polyphenols. These compounds have strong health-promoting properties and offer considerable scope for utilization in value-added applications. The antioxidant-rich litchi peel can be effectively utilized in the development of functional foods and nutraceutical products aimed at promoting health and preventing diseases. In addition, these bioactive constituents have potential use as natural preservatives, helping to improve the shelf life and safety of food products in an eco-friendly manner.

Processing and value addition further enhance the utility of litchi. Products such as juices, squashes, and dried litchi not only increase the availability of the fruit beyond its short harvesting season but also facilitate better nutritional utilization. Thus, litchi and its by-products present promising opportunities for developing health-oriented products while also contributing to waste reduction and sustainable horticulture.



Value-added litchi products developed by ICAR-National Research Centre on Litchi, demonstrating potential for enhanced nutrition, shelf life, and income generation

Enhancing nutritional quality through post-harvest management

Maintaining the nutritional quality of litchi after harvest is crucial, as the fruit is highly perishable and prone to rapid deterioration under ambient conditions. Improper handling can lead to significant losses in vitamin C, antioxidants, and overall fruit quality. Therefore, adoption of scientific post-harvest management practices is essential to preserve its nutritional integrity and market value. In this regard, ICAR-National Research Centre on Litchi has been playing a pivotal role in developing and disseminating improved post-harvest technologies for litchi. Improved storage and packaging practices, including the use of perforated packaging materials and modified atmosphere techniques, have also been promoted to reduce physiological losses and maintain fruit freshness. Such interventions are particularly important for distant marketing and export, where quality retention is a major concern.

Processing technologies further contribute to enhancing the availability and utilization of litchi. Techniques such as juice extraction, pulp preservation, dehydration, and preparation of products like squash and nectar not only extend shelf life but also ensure year-round accessibility of nutrients. The development of value-added products from litchi, has opened new avenues for reducing post-harvest losses and improving farmers' income. Overall, scientific post-harvest management, coupled with processing and value addition, plays a vital role in preserving the nutritional richness of litchi and



Manual and mechanical peeling of litchi fruits for preparation of litchi-based rasgulla and value-added products, involving systematic separation of aril (pulp), with pericarp (peel) and seeds generated as processing by-products, indicating their potential for value-added utilization

strengthening its contribution to nutrition security and horticultural development in India.

Litchi honey: Where flavor meets health: Litchi honey is a premium, monofloral honey produced by bees that forage predominantly on the blossoms of litchi orchards during the flowering season. It is known for its light amber colour, delicate floral aroma, and pleasantly mild sweetness, making it highly preferred by consumers. Nutritionally, litchi honey is rich in natural sugars, enzymes, amino acids, vitamins, and antioxidants, which contribute to its health-promoting properties. Regular consumption is associated with improved digestion, enhanced immunity, and quick energy supply. It also exhibits antimicrobial and anti-inflammatory properties, making it useful in traditional remedies. From an economic perspective, litchi honey offers an excellent opportunity for integrating beekeeping with litchi cultivation, thereby enhancing pollination, improving fruit yield, and providing additional income to farmers.

SUMMARY

Litchi is a unique fruit that combines excellent taste with high nutritional and health value, making it highly relevant for modern diets. Rich in vitamins, minerals, and bioactive compounds, it supports immunity and helps address hidden hunger and nutritional security in India. Beyond nutrition, its potential in functional foods, nutraceuticals, and value-added products enhances utilization and reduces wastage. Scientific interventions by ICAR-National Research Centre on Litchi in post-harvest management and processing have further strengthened its importance as a high-value crop. With expanding cultivation and awareness, litchi is emerging as a nutrition-smart fruit contributing to both public health and farmers' livelihoods.

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