

Value-Added Chili products

Innovations and Production Challenges

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Introduction

Chilli is known as the universal spice of India. It possesses therapeutic properties and stimulates both the heart and respiratory system. In India, various marketing channels, including agents, cooperatives, country buyers, and central marketing companies, play a significant role in its distribution. Value-added products

derived from chilli include chilli sauce, jam, pickles, chilli powder, confectionery, and chilli puree, with chilli powder being the most preferred among consumers. The varieties commonly used for chilli powder production include 341, 273, and Byadgi, known for their vibrant color and mild spice level.

Worldwide Statistics on chilli production and exports

Chilli is cultivated over an area of 2,020 thousand hectares, yielding approximately 3,762 thousand tonnes. Major chilli-growing countries include India, Myanmar, Bangladesh, Pakistan, Thailand, Vietnam, and Romania. India is the largest producer of chilli, accounting for an annual production of 13.76 million tonnes.

China is the major importer of chilli, followed by the USA, Thailand, Sri Lanka, Indonesia, Bangladesh, Malaysia, and the UAE. Between 1993 and 2000, chilli exports increased by 19% to 42%, significantly boosting total spice exports.

India statistics on chilli production and exports

Indian chilli is preferred for its thick oleoresin content, which is in high demand across pharmaceutical, food, and cosmetic industries. Chilli is cultivated in almost all states of India, with the top five producing states being Andhra Pradesh, Telangana, Madhya Pradesh, Karnataka, and Odisha. Currently, the export of chilli from India has fluctuated, ranging from 46% in 2010-2011 to 38% in 2013-2014 and

43% in 2018-2019. The demand for chilli is increasing, mainly due to effective pest management systems during export. Two significant factors contributing to increased exports from India are the challenges in domestic production in countries like Vietnam and the establishment of processing units by major Indian chilli importer, China.

Andhra Pradesh statistics on chilli production

Andhra Pradesh is considered the largest chilli-producing state in India. The state's horticulture department and ITC Limited signed a memorandum of understanding to establish an

Integrated Agri Extension Platform (IAEP) focusing on the chilli value chain in 2019-2020. From 2010-11 to 2021-22, the area under cultivation has increased, but production has

decreased due to lower yields caused by pest attacks. Among the 13 districts, six key districts for chilli production are Guntur, Prakasam,

Kurnool, Krishna, Ananthapur, and East Godavari.

Production aspects of chilli

The combination of organic and inorganic fertilizers has been shown to enhance nitrogen uptake compared to using organic fertilizers alone. The application of vermicompost, panchagavya, azospirillum, and phosphobacteria has effectively reduced flower drop in chilli plants. Optimal yields have been achieved with a nutrient mix of 50% nitrogen from vermicompost and 50% from urea, while a mix of 75% nitrogen from neem cake and 25% from urea resulted in high-quality chilli. Drip irrigation has been beneficial, saving 62% water and increasing yield by 44%. However, production costs have risen with increased farm size, and the average yield of chilli per hectare is approximately 75 quintals for small, marginal, and medium farmers.

Constraints in red chilli production and value chain

Chilli production faces various constraints, which can be categorized as technological, socio-economic, biotic, abiotic, institutional, marketing, and infrastructural. Key challenges include:

Technological: Dependence on hybrid seeds, non-availability of quality seeds, total reliance on private hybrids, lack of knowledge regarding micronutrient deficiencies, indiscriminate pesticide use, and insufficient knowledge of post-harvest technology.

Socio-Economic: Lack of credit facilities and labor scarcity.

Biotic: Pest infestations and disease management.

Abiotic: Weather-related impacts.

Institutional: Insufficient government support and absence of special schemes for cultivation.

Marketing: Price fluctuations and high transportation costs.

Processing: High capital requirements, electricity charges, quality variations, and labor scarcity.

Wholesalers face issues such as a lack of storage facilities, poor quality, late payments, and high transportation costs, complicating the supply chain..



Value chain analysis

Focusing on pre-harvest financing contracts for red chilli can yield higher profits compared to post-harvest options. Chilli is graded based on color, size, and other factors, and can be stored for up to two years in cold storage. Areas around Chennai prefer medium color and

pungency levels. The primary wholesaler incurs costs related to cleaning, loading, unloading, storage, and transport, while secondary wholesalers handle chilli for powder preparation.

Value added products of chilli

Chilli powder

- The moisture content of chilli powder should range from 8-10% to prevent mold growth.

- Ash content typically ranges from 4.53% to 7.39%.
- Acid-insoluble ash content should be around 1.3%.

- Volatile fat content is generally between 1.6% and 2%. Salmonella should be absent in chilli powder.

Chilli pickle

- Pickling is a traditional method for preserving fruits and vegetables, requiring a moisture content of approximately 80.29%.
- The mixture of spices or stuffing material is crucial for flavor.
- Freshly extracted mustard oil is used in the preparation of chilli pickle.
- The iodine value serves as a qualitative measure of oil quality.
- Freshly prepared pickles can be stored for up to 75 days, with a maximum of 90 days. pH is a key factor during storage.

Chilli sauce

- Six attributes are considered during chilli sauce preparation: flavor, size, price, packaging, herbal ingredients, and organic products.
- Price is a major factor affecting consumer preference, especially in the northeastern region.
- Hot and sweet varieties are predominantly preferred for the flavor of chilli sauce.
- This overview captures the complex landscape of chilli production and its value chain in India, highlighting the spice's significance in both domestic and global market.

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