



Streamlining the Indian Spices Market

Issues and Way Forward

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AGENDA

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Food Safety and Standards: Issues, Impact and Recommendations to Streamline the Spices Market

The Global Spice Market and India

WHAT IS DRIVING DEMAND

-  Culinary traditions and rising preference for authentic flavours
-  Increasing demand from the food processing industry
-  Growing awareness of the health benefits of traditional spices
-  Rising disposable incomes and urbanisation boosting demand for convenient, packaged spice products

MULTIPLE END USES



India leads global spice production and is the world's largest consumer of spices. China, Vietnam, Indonesia, Nigeria and Ethiopia are other key producing countries.

USD 27–30.5 bn

Global spice market value in 2024

USD 54.75 bn

Projected global market size by 2033

6.71% CAGR

Projected global growth, 2025–2033

#1 India: largest producer and largest consumer of spices globally

The Indian Spice Market for Food: The Context

USD 5.15 bn

Estimated spices market for food, 2025

63%

Market share of whole & ground single spices, driven by household and institutional demand

271 g

Spices consumed by the average Indian in one month (Srivastava et al., 2024)

60–80%

Of the spices market is informal

FOOD: THE LARGEST END USE

- Food accounts for the largest end use of spices in India.
- Whole and ground single spices dominate due to their ease in cooking — demand comes from households and institutions (food processing industry, hotels, etc.).
- While the government has institutional mechanisms and policies, there are gaps in standards and implementation, often leading to food safety issues.



Why the informal sector keeps growing

- Informal players do not pay taxes, may sell loose, unbranded products, and may not follow food safety and standards requirements.
- Poor implementation of standards, no single agency monitoring the entire supply chain, and a fragmented supply chain have driven the rise of the informal sector.
- This increases the regulatory-compliance burden on the formal sector, which must adhere to the mandatory FSSAI standards.

Objective of the Policy Brief

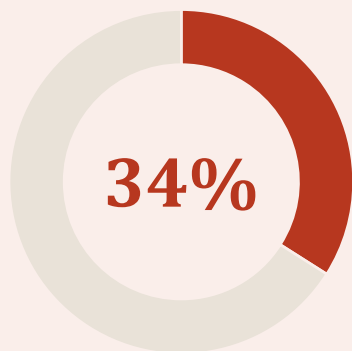
The objective of the policy brief is to:

- understand the challenges in food safety and standards across the spices value chain, and suggest measures to enhance food safety,
- help formalise the Indian spice market, help the packaged and branded product market to grow, and
- support MSMEs to scale up in developing their brands and packaged products.

This policy brief covers only the conventional spices supply chain. It examines in depth three of the most common whole and ground spices used in Indian households and the food industry — red chilli, turmeric and coriander. As of 2025, India is the leading producer of all three.



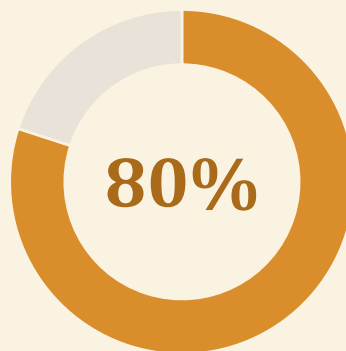
Red Chilli



of global production
is grown in India (2025)



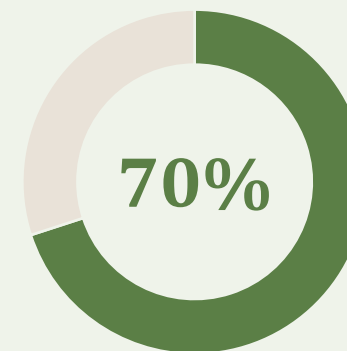
Turmeric



of global production
is grown in India (2025)



Coriander



of global production
is grown in India (2025)

An Overview of Spices Production in India

12.99 mn t

Total production of 23 spices in 2024-25

+4.1% / +1.4%

Growth in production / area, 2023-24 to 2024-25

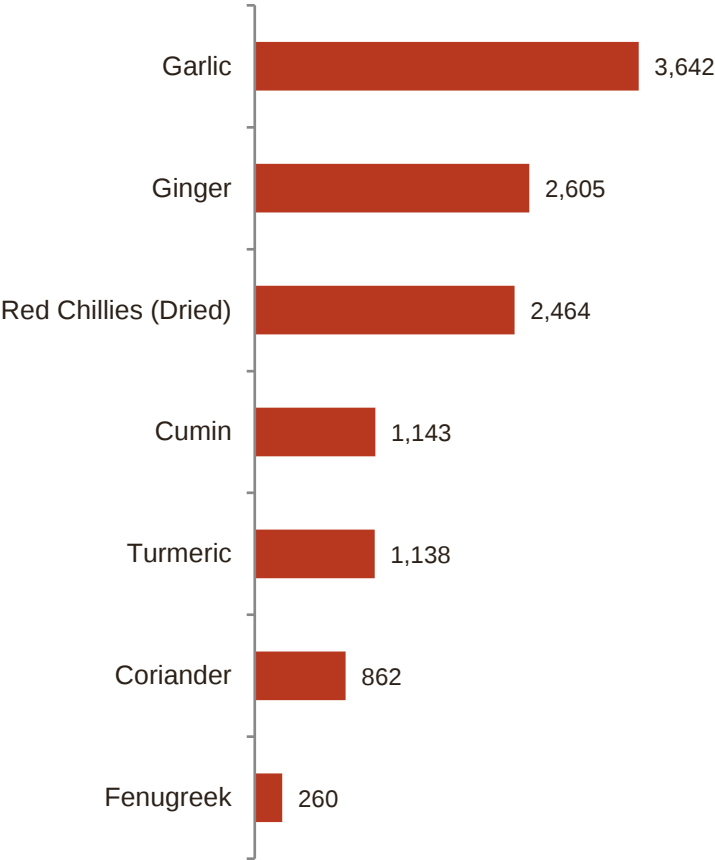
68%

Of 2025-26 production comes from just garlic, ginger and dried red chillies

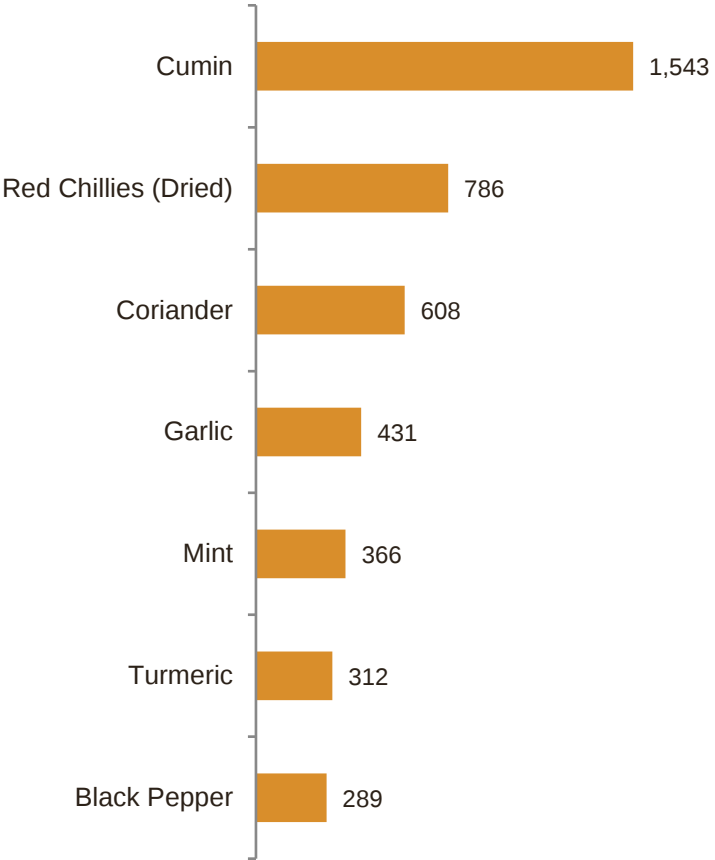
58%

Of the production area is under cumin, dried red chillies and coriander

Top spices by production, 2025-26 ('000 MT)



Top spices by area, 2025-26 ('000 Ha)



Top 5 spices = 85.7% of production and 73.6% of area; top 7 = 94.5% and 85.5%. Source: Compiled from 2025-26 (First Advance Estimates), Area and Production of Horticulture Crops, agriwelfare.gov.in (last accessed April 08, 2026).

Spice Production across the States

Spices production is concentrated in a few states:

>50%

Of total spice production (across 28 states) comes from Madhya Pradesh, Rajasthan and Andhra Pradesh

~58%

Of the total area under spices is in Rajasthan, Madhya Pradesh and Gujarat

>50%

Of India's coriander production in 2025-26 is estimated to come from Madhya Pradesh alone

47%

Of dried red chillies are estimated to be produced by Andhra Pradesh

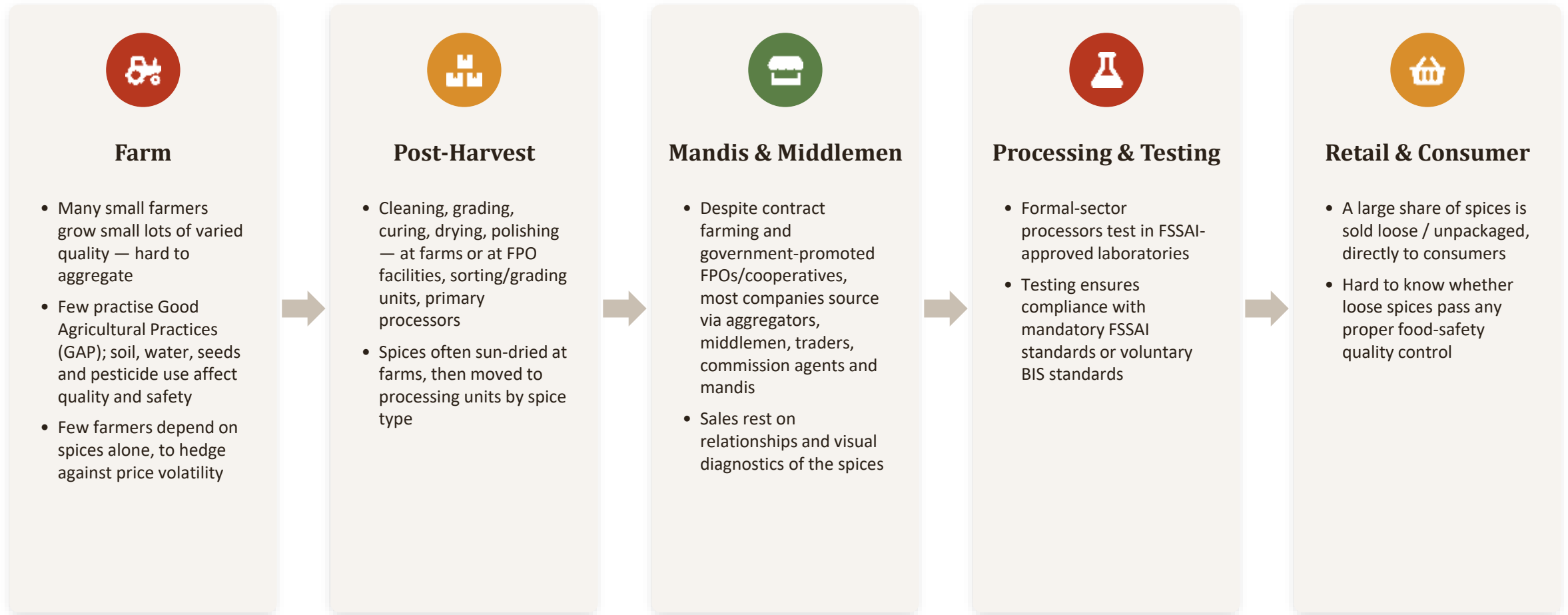


The top five states vary in quantity of production versus area under production — indicating a difference in yield across the spices and the states.



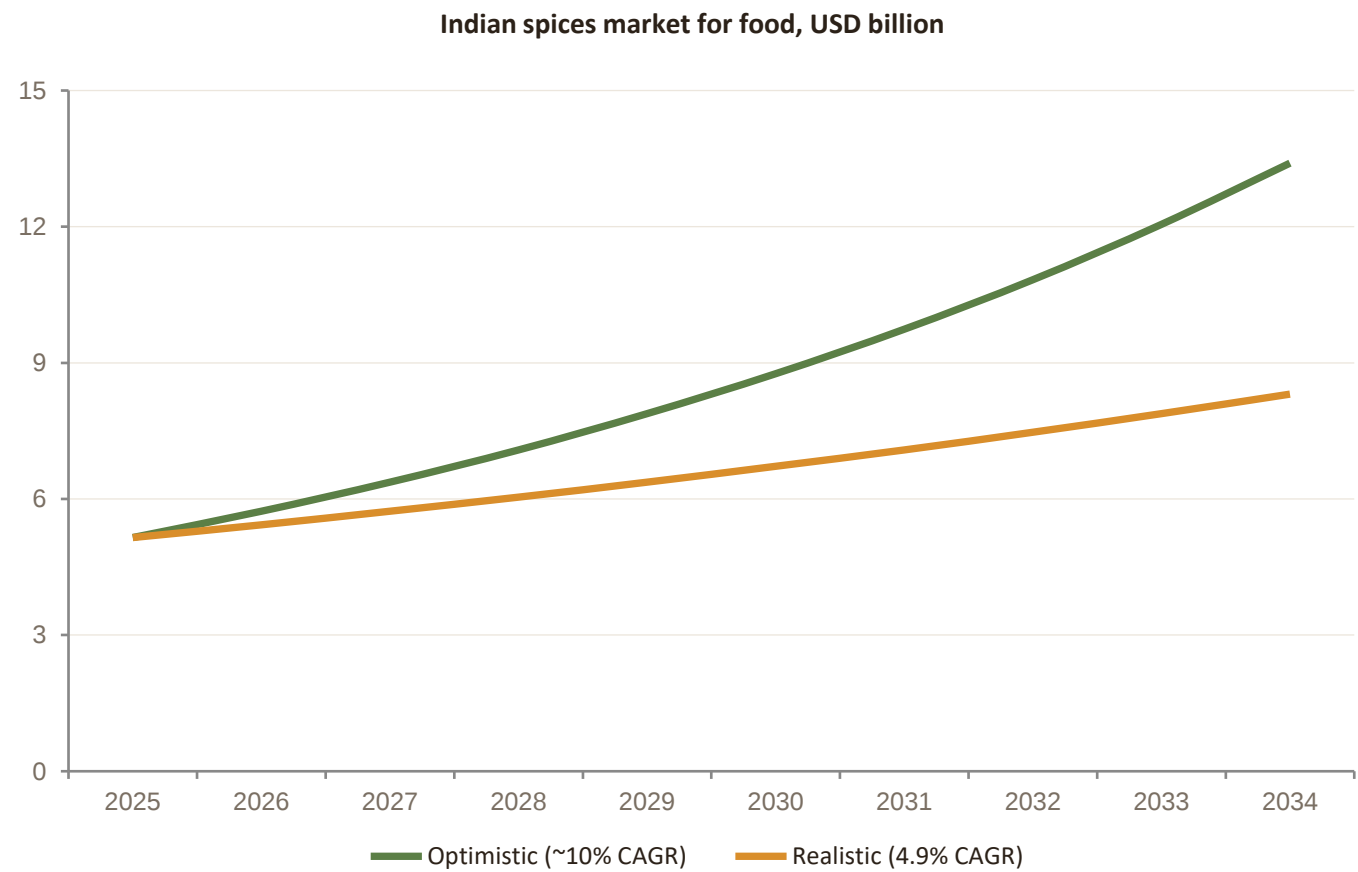
Way forward: diversify the production of spices like coriander and chillies across states to de-risk production and supply, and reduce overdependence on a single state.

A Fragmented Spices Supply Chain



Source: Mukherjee et al. (2025)

Growth Projection of the Indian Spice Market: Realistic vs Optimistic



Base: market size of USD 5.15 billion in 2025. Source: Estimated by the Authors.

Realistic — business as usual

Current industry and government efforts continue.

USD 8.31 bn by 2034

Average CAGR of 4.9%, 2025–2034

Optimistic — streamlined supply chain

Government and industry streamline the chain with a focus on food safety and quality.

USD 13.4 bn by 2034

~10% CAGR — double the realistic growth rate

What holds growth back: a large informal market, food safety concerns and a fragmented supply chain.

Government Agencies Regulating Food Safety and Quality Standards

India's governance structure is quasi-federal — subjects like agriculture and retail fall under state jurisdiction.



At the Centre

- Multiple government bodies regulate different parts of the spices value chain.
- No single nodal agency oversees the entire value chain, from farm to retail.
- The Centre can give broad guidelines and is responsible for food safety standards.



At the States

- Dedicated departments — e.g. the State Horticulture Department or State Horticulture Mission — implement centrally sponsored schemes like the National Horticulture Mission.
- States play the key role in implementing food safety standards at the farm level, in the Agricultural Produce Marketing Committees (APMCs), etc.



A lack of coordination between the Centre and the states can adversely impact policy implementation.

Different Agencies at the Centre — Roles and Responsibilities

Ministry / Department	Agency	Role and responsibilities
Ministry of Health and Family Welfare (MoHFW)	FSSAI — Food Safety and Standards Authority of India	Nodal authority for food safety and health standards for the domestic market and imports. Mandatory quality standards for 45 spices. Regulatory authority from post-harvest to retail — but not over farmers. 169 Primary Food Laboratories notified for spices testing.
Ministry of Consumer Affairs, Food & Public Distribution	BIS — Bureau of Indian Standards	Voluntary standards for 16 spices, covering food safety plus physical characteristics such as colour, odour and flavour. Has designated testing laboratories — but not all are FSSAI-approved.
Ministry of Agriculture and Farmers Welfare (MoAFW)	DASD — Directorate of Arecanut and Spices Development	Coordinates and monitors spices development through schemes like the Mission for Integrated Development of Horticulture (MIDH) and programmes such as Production and Distribution of Planting Materials of Spices and Accreditation of Spices Nurseries. Collects and collates data on spices production (area and quantity).
Ministry of Agriculture and Farmers Welfare (MoAFW)	NHB — National Horticulture Board	Supports spice quality and standards through nursery recognition and promotion of high-quality planting materials.
Ministry of Food Processing Industries (MoFPI)	—	Supports spice processors/manufacturers with infrastructure, capacity building and financial assistance. PMKSY (Pradhan Mantri Kisan SAMPADA Yojana): the Food Safety and Quality Assurance Infrastructure sub-scheme funds Food Testing Laboratories with NABL accreditation. PMFME: credit-linked subsidy to micro food processing enterprises, FPOs, SHGs and cooperatives for processing facilities, marketing and branding.

Standards and Testing for Spices: Codex Alimentarius, FSSAI and BIS

232

FSSAI-notified laboratories in total

169 (72%)

Of them can test herbs, spices & condiments, per their scope of accreditation

65%

Of those 169 labs (109) sit in just 7 states/regions — unevenly spread across India

418

BIS-recognised labs — but no information on how many can test spices



Partial alignment

Standards set by FSSAI and BIS are only partially aligned with each other and with Codex — creating confusion among stakeholders.



Multiple testing requirements

Multiple agencies mean multiple testing requirements, with each agency maintaining its own list of laboratories.



An open question

It is unclear why BIS has not adopted all FSSAI-approved laboratories for spices testing.

Whole Chillies Standards: Codex vs FSSAI vs BIS (1 of 2)

Characteristic	Codex Alimentarius	FSSAI	BIS
Mandatory or voluntary	Voluntary	Mandatory	Voluntary
Common name	Chilli Pepper	Chillies and Capsicum (Lal Mirchi)	Chillies and Capsicum (Lal Mirch)
Scientific name	<i>Capsicum annuum</i> L., <i>C. frutescens</i> L., <i>C. baccatum</i> var. <i>pendulum</i> (Willd.) Eshbaugh, <i>C. chinense</i> Jacq., <i>C. pubescens</i> Ruiz & Pav	<i>Capsicum annuum</i> L., <i>Capsicum frutescens</i> L.	<i>Capsicum frutescens</i> Linnaeus and <i>Capsicum annuum</i> Linnaeus
Extraneous matter	≤ 1% (w/w)	≤ 1% by weight	≤ 1% (m/m)
Unripe and marked fruits	—	≤ 2% by weight	≤ 2% by weight
Broken fruits, seeds and fragments	≤ 10% (w/w)	≤ 5% by weight	≤ 5% by weight
Moisture	≤ 11% by mass	≤ 11% by weight	≤ 11% by mass
Total ash on dry basis	≤ 10% by mass	≤ 8% by weight	≤ 8% by mass
Ash insoluble in dilute HCl, dry basis	≤ 1.6% by mass	≤ 1.3% by weight	≤ 1.3% by mass (acid-insoluble ash, dry basis)
Insect damaged matter	≤ 3% (w/w), combined with mould damage	≤ 1% by weight	≤ 1% (m/m)
Total aflatoxin	≤ 20 µg/kg**	≤ 30 µg/kg*	≤ 30 µg/kg
Aflatoxin B1	—	—	≤ 15 µg/kg
Pungency (Scoville Heat Units)	≥ 900	—	≥ 24,000****

Notes and full sources in the slide notes. Source: Compiled from Codex CXS 353-2022; FSSAI Food Additives Regulations; BIS IS 2322:2023 — Chillies and Capsicum (Lal Mirch), Whole and Ground.

Whole Chillies Standards: Codex vs FSSAI vs BIS (2 of 2)

Characteristic	Codex Alimentarius	FSSAI	BIS
Off size	≤ 5% (w/w)	—	—
Other similar varieties	≤ 10% (w/w)	—	—
<i>Salmonella</i>	Products should comply with any microbiological criteria established in accordance with the principles and guidelines for the establishment and application of microbiological criteria related to foods (CXG 21-1997).	Absent in 25 g***	Absent in 25 g
<i>Bacillus cereus</i>		10 ³ to 10 ⁴ ***	10 ³ to 10 ⁴
Sulphite Reducing Clostridia		10 ² to 10 ³ ***	10 ² to 10 ³
Aerobic Colony Count		10 ⁶ to 10 ⁷ ***	—
Yeast and Mould Count		10 ⁴ to 10 ⁵ ***	—
<i>Enterobacteriaceae</i>		10 ² to 10 ³ ***	—
<i>Staphylococcus aureus</i>		10 ² to 10 ³ ***	—
Excreta, foreign matter, live insects	Mammalian/other excreta ≤ 1 mg/kg; foreign matter ≤ 0.5% w/w; live insects 0 count/100 g	Pods shall be free from mould, living and dead insects, insect fragments, rodent contamination.	Free from living insects; practically free from mould growth, dead insects, insect fragments and rodent contamination visible to the naked eye or with required magnification.
Odour, colour and added colour	Characteristic odour, flavour and colour (may vary with geoclimatic conditions); free from foreign odour/flavour/colour, especially rancidity and mustiness; free from adulteration.	Free from extraneous colouring matter, coating of mineral oil and other harmful substances.	Ground chillies and capsicum shall be free from extraneous colouring and flavouring matter.
Food additives	Anticaking agents listed in Table 3 of the General Standard for Food Additives (CXS 192-1995) acceptable for ground/powdered form.	—	—

Coriander Whole Standards: FSSAI vs BIS

Characteristic	FSSAI	BIS — Grade 1 Special	BIS — Grade 2 Standard
Mandatory or voluntary	Mandatory	Voluntary	
Common / scientific name	Coriander (Dhania) whole — Coriandrum sativum L.	Coriander Whole — Coriandrum sativum L.	
Extraneous matter	≤ 1.0% by weight	≤ 2% by mass	≤ 4% by mass
Split fruits	≤ 10.0% by weight	≤ 4% by mass	≤ 10% by mass
Damaged / discoloured fruits	≤ 2.0% by weight (insect damaged ≤ 1.0% by weight)	≤ 1% by mass	≤ 2% by mass
Shriveled and immature fruits	—	≤ 1% by mass	≤ 2% by mass
Fruits of other varieties	—	≤ 2% by mass	≤ 4% by mass
Moisture	≤ 9.0% by weight	≤ 9% by mass	
Volatile oil content, dry basis	≥ 0.1% (v/w)	≥ 0.1% by mass	
Total ash, dry basis	≤ 7.0% by weight	≤ 7.0% by mass	
Acid-insoluble ash, dry basis	≤ 1.5% by weight	≤ 1.5% by mass	
Moulds, insects, etc.	Free from mould, living and dead insects, insect fragments, rodent contamination.	Free from visible moulds and insects.	
Odour, taste and flavour	Typical aroma; free from mustiness.	Characteristic pleasant taste and aroma; free from musty odour.	
Added colour	Free from added colouring matter.	Free from added colours.	
Salmonella	Absent in 25 g*	Absent in 25 g	
Microbiological counts (cfu/g)	Aerobic colony 10^6 – 10^7 ; yeast & mould 10^4 – 10^5 ; Enterobacteriaceae 10^2 – 10^3 ; S. aureus 10^2 – 10^3 *	—	

Streamlining the Indian Spices Market (1 of 4)

ISSUE

1

Regulatory gaps

- FSSAI has no regulatory authority over farmers
- Gaps in Centre–state coordination
- Limited coverage of spices and their varieties by standard-setting bodies; domestic standards not fully aligned with Codex
- Multiple standard-setting bodies with overlapping regulations and varying standards; poor monitoring and implementation of FSSAI standards

IMPACT

- Difficult for industry to establish traceability to the farm
- Poor Centre–state coordination adversely impacts policy implementation
- Lack of standards leads to variable quality and can enable adulteration; higher chances of export rejection due to contamination
- Multiple standards raise compliance costs and hinder business — feeding a large informal sector and burdening the formal sector

RECOMMENDATION

Strengthen food safety and quality standards

- A single nodal agency to monitor the entire spices supply chain
- Improve coordination between the Centre and states
- Position India as a global leader for spices standards; reduce overlap between regulatory bodies and set standards for all spices
- Strengthen monitoring and implementation of FSSAI standards; extend food safety measures to the farm level

2

Issues with laboratory testing

- Lack of uniformity across spice testing laboratories
- Delayed test results — each test takes roughly 4–10 days
- Not all labs can test on all parameters, for lack of equipment or skilled manpower

- Variation in standards produces varying test results across laboratories
- Companies must visit multiple labs to obtain all required approvals for a spice
- Increased testing time; compliance cost up by INR 25,000–30,000

Streamline spice laboratory testing

- Uniform testing parameters across all spice testing laboratories, to reduce variation in results and cut compliance costs
- All FSSAI-notified laboratories should have BIS approval for spices testing

Streamlining the Indian Spices Market (2 of 4)

ISSUE

3

Gaps in data on production and consumption

- No production data for commercially important spices like kokum; no spice-specific consumption data
- No data on spice farmers, FPOs and cooperatives; no consolidated list of FSSAI/BIS spice-testing labs
- Data gap at mandis — aggregators, middlemen, traders and commission agents keep no purchase records

IMPACT

- Hard for industry to estimate demand and build business plans
- Manufacturers, sourcing agents and buyers do not know whom to approach
- Difficult to identify laboratories to work with — and to trace contaminated products back to farms

RECOMMENDATION

Mitigate data gaps: collect & collate data

- A detailed database of all spices, varieties and region/state-wise production areas
- Industry and associations to collect spice-wise consumption data — for demand forecasting, production planning and lower post-harvest losses
- An online, detailed FPO database so companies can find supply-chain partners

4

Poor inputs, excess agro-chemicals, weak storage and post-harvest care

- Contaminated irrigation water and industrial emissions pollute air and soil
- Excessive pesticide/fertiliser use degrades soil and makes crops more vulnerable to pests and disease
- Wilful offenders intentionally adulterate spices for profit

- Adulterated products erode 20–25% of branded products' market share
- Adulterants beyond threshold limits pose health risks
- Contamination damages company reputations and has caused global-market rejections, hurting India's standing

Cut chemical usage; improve farm practices

- Training and capacity building on storage and post-harvest processing
- Target lower contamination, GAP adoption, soil and water testing, and other environmental and sustainable practices

Streamlining the Indian Spices Market (3 of 4)

5

ISSUE

Gaps in technology adoption

- Low farm-level technology adoption; poor records of pesticide/insecticide use
- Slow uptake of low-carbon processing and alternatives to sun drying

IMPACT

- Limited traceability makes contamination sources hard to identify
- Open sun drying is slow and yields inconsistent quality
- Poor storage causes contamination and wastage of spices

RECOMMENDATION

Adopt technology across the supply chain

- All aggregators, middlemen, traders and commission agents should keep records tracing spice supply to farmers and farms
- Industry associations may work with state governments to establish farm-level traceability

6

Issues with the FPOs

- Companies doubt FPOs' supply consistency
- FPOs charge 10–15% more than aggregators
- Buyers cannot verify FPO quality claims or farming practices without costly third-party audits

- Companies keep sourcing from traders and middlemen
- FPOs fail to enter companies' supply chains

Scale up FPOs; close the information gap

- Strict monitoring of food safety standards at FPOs to ease consistency concerns
- A comprehensive, product-specific FPO database so companies can find and engage the right FPOs
- More support to onboard FPOs onto e-commerce and government platforms, and educate farmers in using them

Streamlining the Indian Spices Market (4 of 4)

7

ISSUE

Storage infrastructure gaps

- Cold storage capacity is only 50% of what is needed
- No record of the location or capacity of storage facilities
- No spice testing laboratories in some states; severe shortage of pack houses in certain districts

IMPACT

- Hard to map existing infrastructure against availability and target where to build
- Poor storage conditions directly cause aflatoxin contamination, spoilage and fungus

RECOMMENDATION

Build adequate storage and laboratories

- Centre and states to map available spice storage and testing infrastructure — and its service quality
- Adequate cold storage to prevent spoilage and reduce aflatoxin contamination
- Sufficient, properly equipped laboratories in states facing shortages

8

Capacity and human-resource issues

- Farmers unaware of soil/water testing needs and how to apply GAP at every stage; low awareness of appropriate pesticides
- Farmers lack post-harvest storage knowledge
- Labs may lack staff trained across all parameters; training quality varies with limited post-training monitoring

- Almost 53% of tested spice samples had residues of non-approved pesticides in 2017-18
- Low-quality or non-approved inputs yield lower-quality or contaminated spices
- Poor storage leads to spoilage and wasted spices

Address skilled manpower shortages

- Farm-level training on regular soil and water testing and crop-appropriate quality inputs
- Train food-processing personnel on food safety and contamination risks; train lab technicians to run all required spice tests
- Multi-stakeholder partnerships for capacity building and targeted training



Thank You

For any queries, please contact



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