

# CHILLI PROCESSING

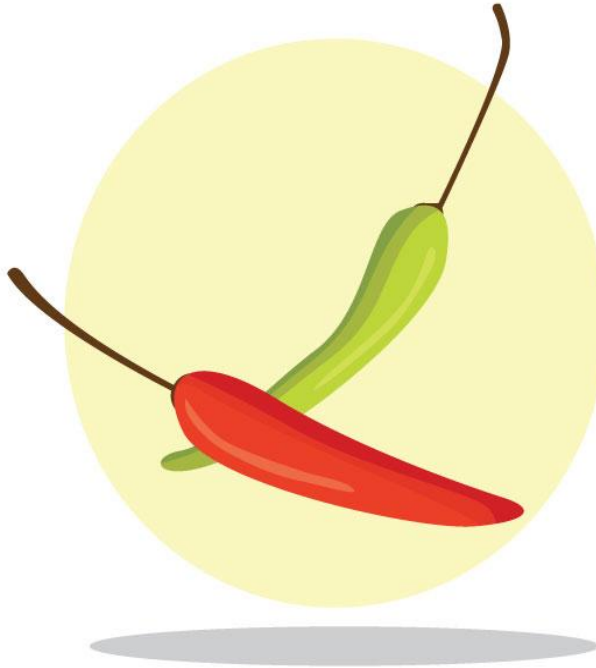


**AATMANIRBHAR BHARAT**

**PM Formalisation of Micro Food Processing  
Enterprises Scheme (PM FME Scheme)**

- ✓ Chilli (*Capsicum annuum L.*) is an indispensable, commercial spice crop native to the tropical America which belongs to the Solanaceae family.
- ✓ It is hot-tasting tropical berry, widely used as condiments or flavorings in every kitchen in the tropics and subtropics.
- ✓ India has emerged today as the foremost producer and exporter of chillies accounting for 42.81% of the world area.
- ✓ Chilli has many medicinal properties, especially as an anti-cancerous agent, increases metabolism by burning fats, instant pain reliever, helps in digestion.

CHILI



## Nutrition Facts

Serving Size 45g

**Amount Per Serving**

**Calories** 18 Calories from Fat 2

**% Daily Value\***

**Total Fat** 0g 0%

Saturated Fat 0g 0%

Trans Fat 0g

**Cholesterol** 0mg 0%

**Sodium** 4mg 0%

**Total Carbohydrate** 4g 1%

Dietary Fiber 1g 3%

Sugars 2g

**Protein** 1g

Vitamin A 9% • Vitamin C 108%

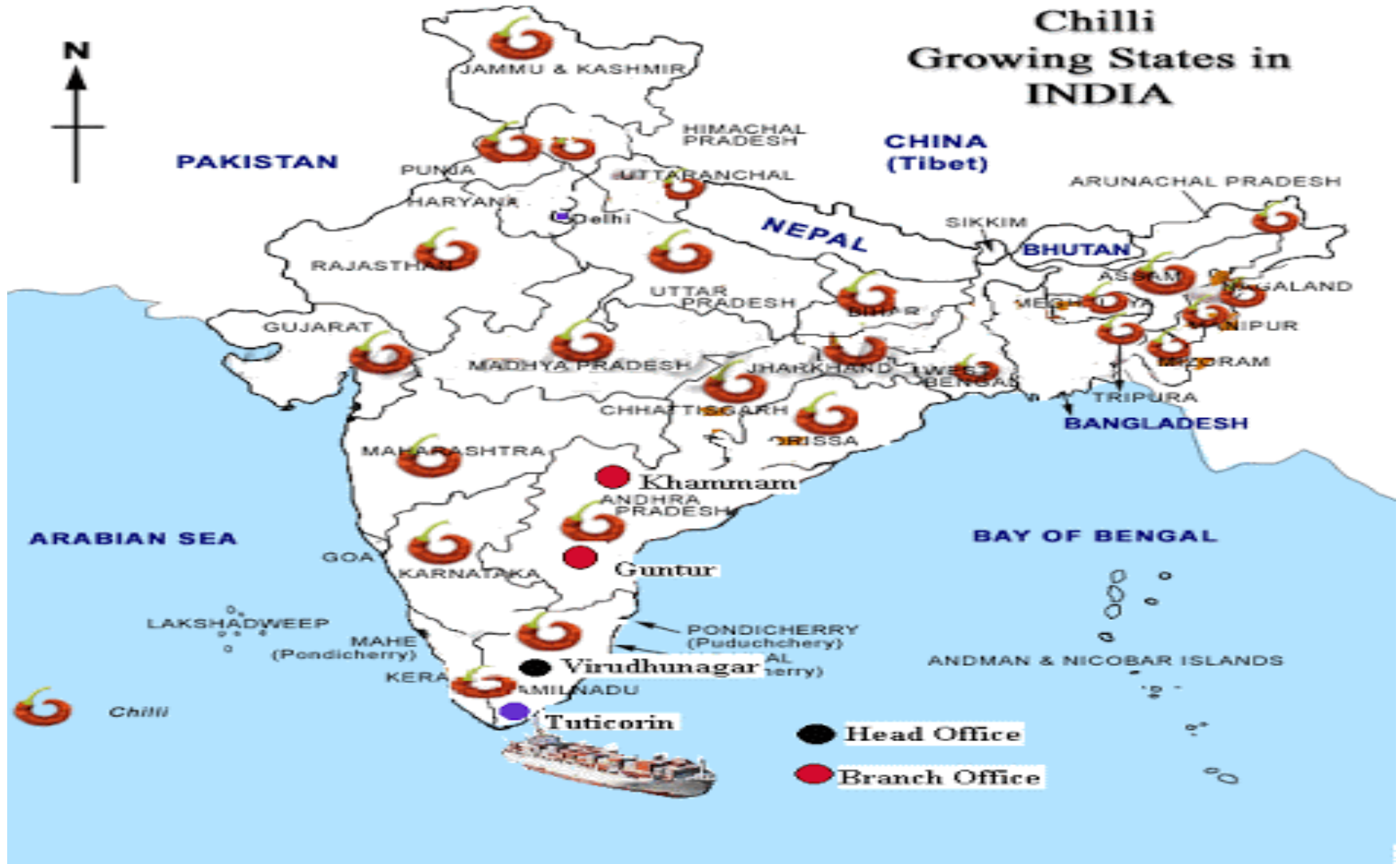
Calcium 1% • Iron 3%

\*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

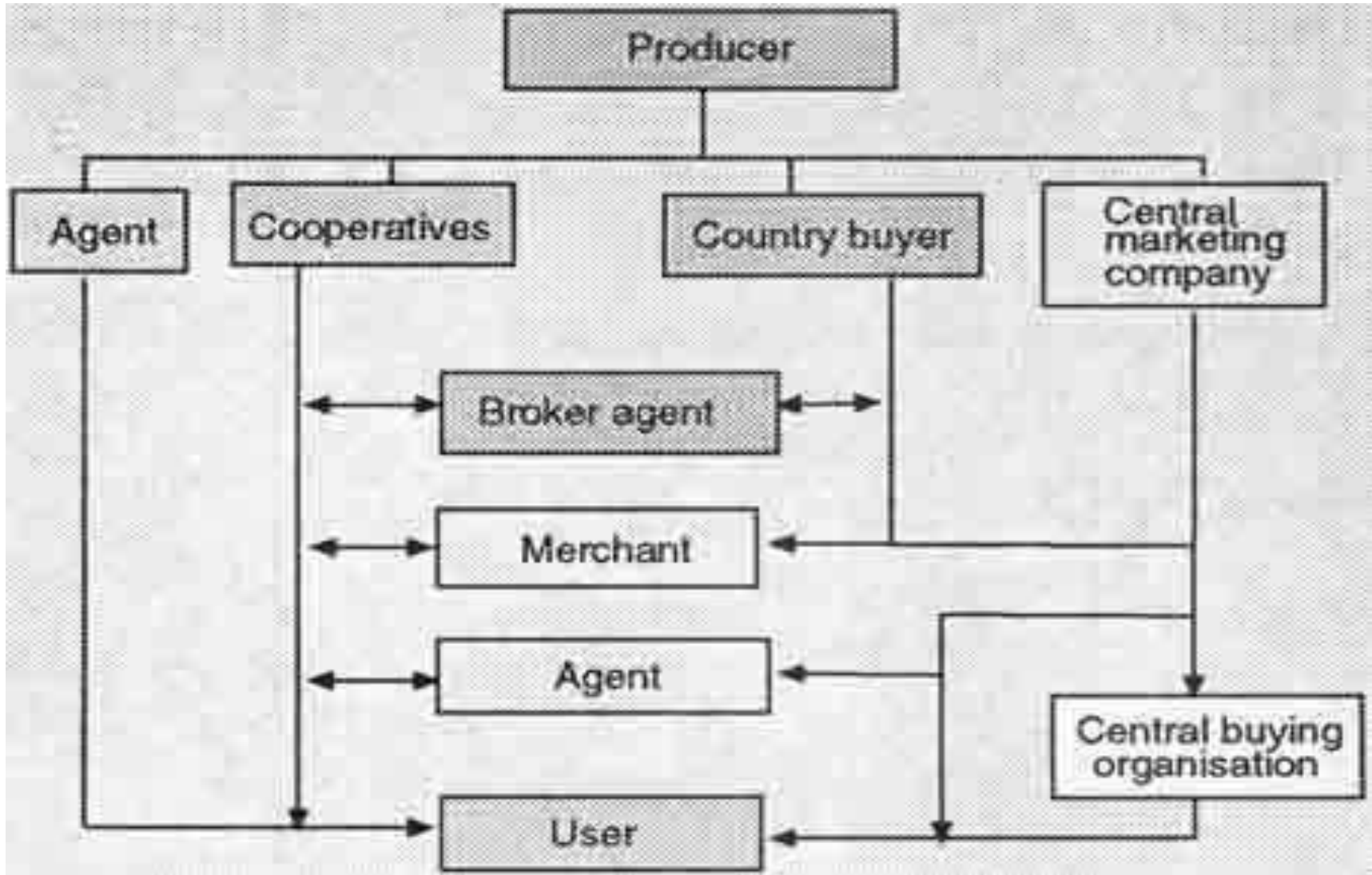
## CHILLI INDUSTRY IN INDIA

- ✓ India is the world's largest producer, consumer, and exporter of chilli.
- ✓ Andhra Pradesh is the largest producer of Chilli in India and contributes about 26% to the total area under Chilli, followed by Maharashtra (15%), Karnataka (11%), Orissa (11%), Madhya Pradesh (7%) and other states contributing nearly 22% to the total area under Chilli.
- ✓ Official statistics show that red chillies are grown across India on 792,000 hectares of land in Andhra Pradesh, Karnataka, Madhya Pradesh and Maharashtra.

# CHILLI GROWING STATES IN INDIA



# CHILLI MARKETING CHANNELS IN INDIA



## **NEED FOR PROCESSING CHILLI**

- Chilli is considered as an indispensable condiment consumed in Indian diet because of its nutritional and nutraceutical properties. It has to be processed to:-
  - ✓ Increase the storage life, because it is highly putrescible.
  - ✓ Value added products composed of chilli like dehydrated chilli, powder, paste; pickle, sauce etc. obtain higher returns. Real return in chilli comes only from processed products.
  - ✓ Provide consumers with an incentive to make purchase.

# PRODUCTS MADE FROM CHILLI



**Chilli Sauce >**



**Chilli Jams & Pickles >**



**Chilli Powders >**



**Chilli Confectionery >**



**Chilli Puree & Mash >**



**Meal, Cooking Sauce >**



## **PFA SPECIFICATION OF CHILLIES (WHOLE AND POWDER)**

- A. 05.05 - chillies (Lai Marché) whole: The dried ripe fruits or pods of *C. annum*. The proportion of extraneous matter including calyx pieces, loose tops, dirt, lumps of earth, stones shall not exceed 5.0% by weight.
- The pods shall be free from extraneous colouring matter, coating of mineral oil and other harmful substances. The amount of insect-damaged matter shall not exceed 5.0% by weight.
- B. 05.05.01 - chilli (Lai Mirchi) powder: The powder is obtained by grinding clean dried chilli pods of *C. frutescens* L./*C. annum*. The chilli powder shall be dry, free from dirt, mould growth, insect infestation, extraneous matter, added colouring matter (and flavouring matter).
- The chilli powder may contain any edible oil to a maximum limit of 2% by weight under a label

## DEPARTMENTS IN A UNIQUE CHILLI PROCESSING PLANT

- ✓ **Production and Operation:** Production planning, Scheduling, managing seasonal production.
- ✓ **Quality Assurance and Regulatory:** Assure quality of the product, Establish food safety, organizing internal audits, Certifications (FSSAI, FSSC 22000, Agmark, BRC etc.) and updating of food safety manual.
- ✓ **Research and Development:** New Product development
- ✓ **Engineering**
- ✓ **Procurement:** Engaged in procurement of raw material, packing material, engineering items, vendor development etc.
- ✓ **Store:** Maintaining the inventory and alarm procurement, maintaining First in, first out (FIFO), Last in, first out (LIFO) etc.
- ✓ **Logistic and Supply Chain:** Deliver products to the consumer at right time

## DIFFERENT OPERATIONS IN CHILLI PROCESSING UNIT



**Sun drying of chillies**

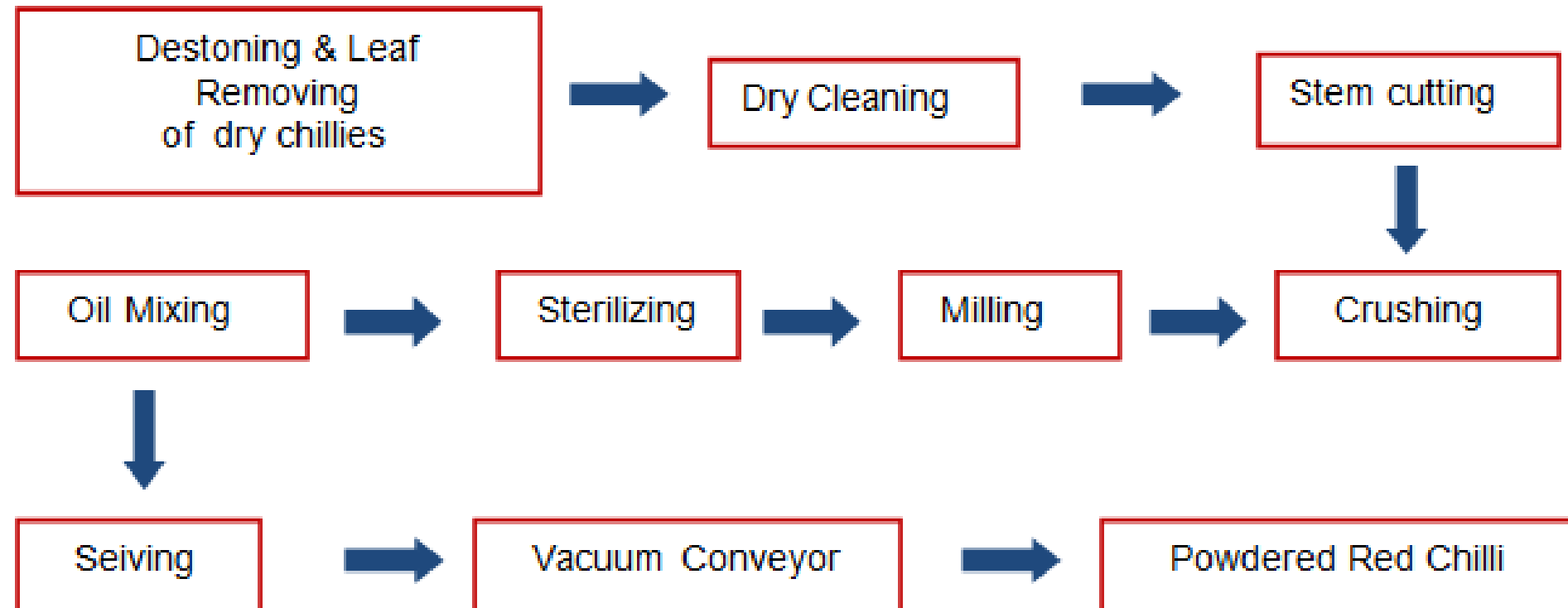
- ✓ Traditionally, matured gathered chillies are dried in the open yards for 15 to 20 days.
- ✓ The cycle includes dunking the red chillies in an uncommonly arranged "Dipsol" arrangement followed by sun drying.
- ✓ Dipsol is a water-based emulsion containing potassium carbonate, refined groundnut oil, gum acacia and butylated hydroxyanisole.
- ✓ This cycle holds the sharpness and normal tone bringing about better yields. The method guarantees a steady finished result.



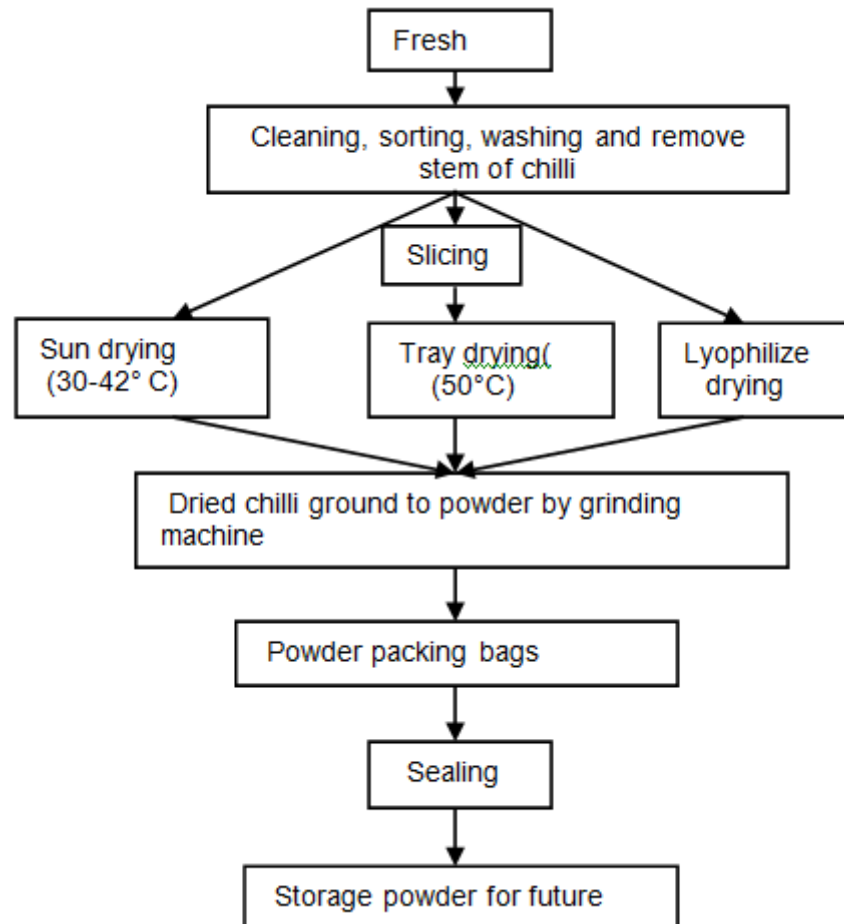
Hot air oven drying

- ✓ Depending upon the type and size of chilli, drying time varies.
- ✓ Wash chillies thoroughly under running tap water.
- ✓ Wipe off the water droplets and arrange chillies lengthwise on the baking tray.
- ✓ Turn on the oven the put it on a low temperature around 100°C. Keep turning the pods every hour for uniform drying.
- ✓ Ideal temperature for drying is 80°C for 8 hours for most of chilli varieties.
- ✓ After drying store them in an airtight container in cool and dark place.

## FLOW CHART OF CHILLI PROCESSING LINE

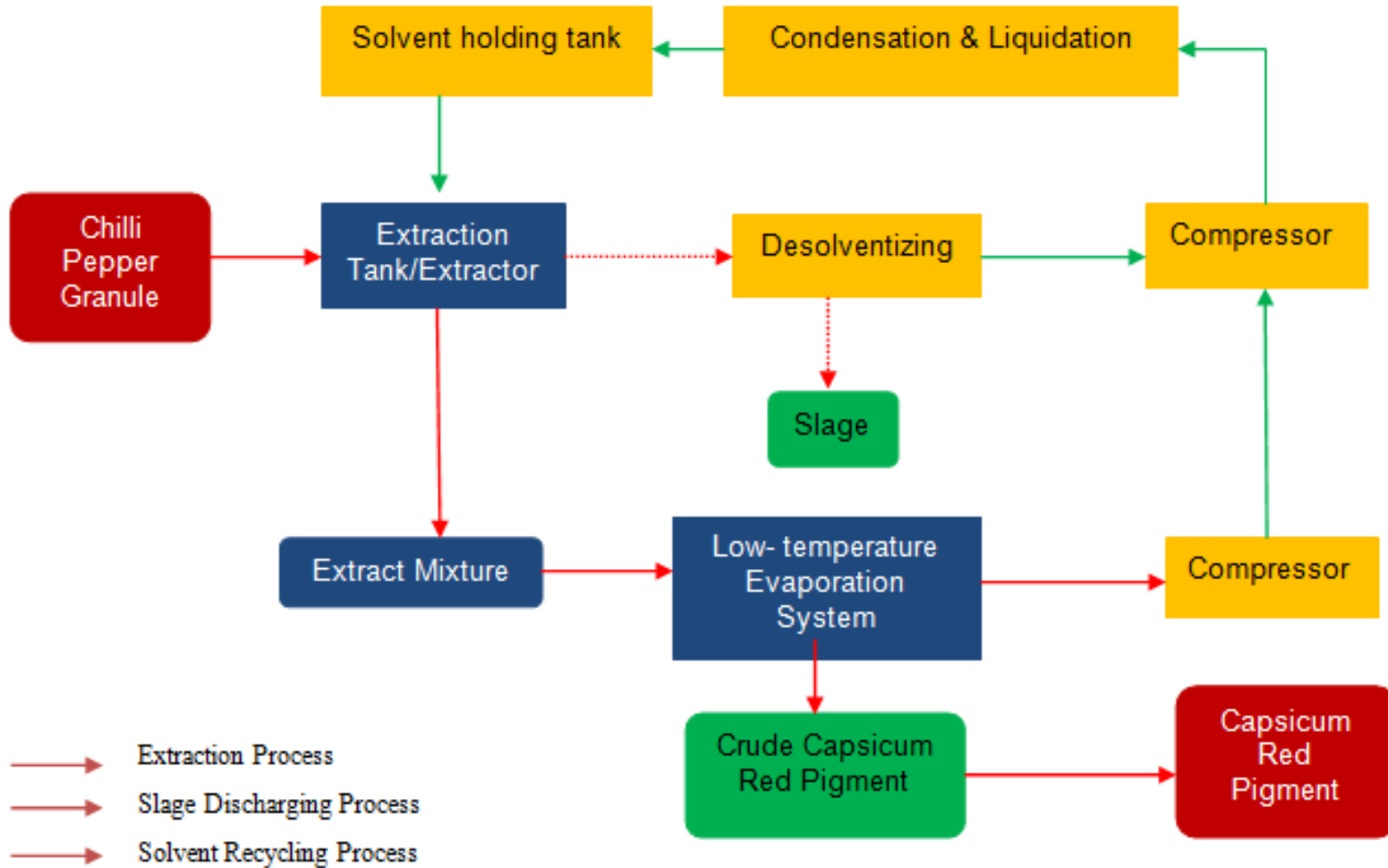


# DIAGRAMMATIC REPRESENTATION FOR PROCESSING OF CHILLI POWDER





# CAPSICUM RED PIGMENT EXTRACTION FROM RED CHILLI



# **CAPSICUM RED PIGMENT EXTRACTION MACHINERY**



# CHILLI DRY CLEANING MACHINE



- ✓ Modern dryers are used to diminish the drying time, give uniform and clean handling conditions to improve the nature of dried chilli.
- ✓ Drying of chilli at high temperature lead to the deficiency of supplements, unstable compound and shading.
- ✓ Chillies have a moderately low unstable substance, which is needy upon species and phase of development.
- ✓ Chillies are dried to make chilli powder and to store it for both short and long haul stockpiling.

# CHILI DESEEDING MACHINE



- ✓ It cut the chilli into sections and then separate the seeds from the chilli with strong winds.
- ✓ It's basically used to isolate chili seed from whole chilli. It is suitable for all kind of chilies.
- ✓ Operator can put total chilli straightforwardly, isolating effectiveness is high, completed chilli is clear off seeds. The seeds can be stuffed straightforwardly.
- ✓ Yield shifts from 400kg-1000kg/hr. It is a significant machine for chilli further handling work.

## CHILLI MILLING AND SIFTING SYSTEM

- ✓ This system is comprised of processing, filtering and dust gather part. It has high programmed degree, simple activity, low work force, low power utilization, high limit and so on.
- a. **Processing part** - It can be isolated into coarse processing and fine processing part.
- b. **Filtering part** - It receives Quantitative screw transport to take care of, taking care of speed can be changed.
- c. **Residue gatherer**- This plant receives yearning transmission, fixing impact is superb, dust is sifted by high pressing factor beat deduster, this generally brought down the sharp smell and residue, working climate is grown significantly.

# CHILLI POWDER SIFTING MACHINE



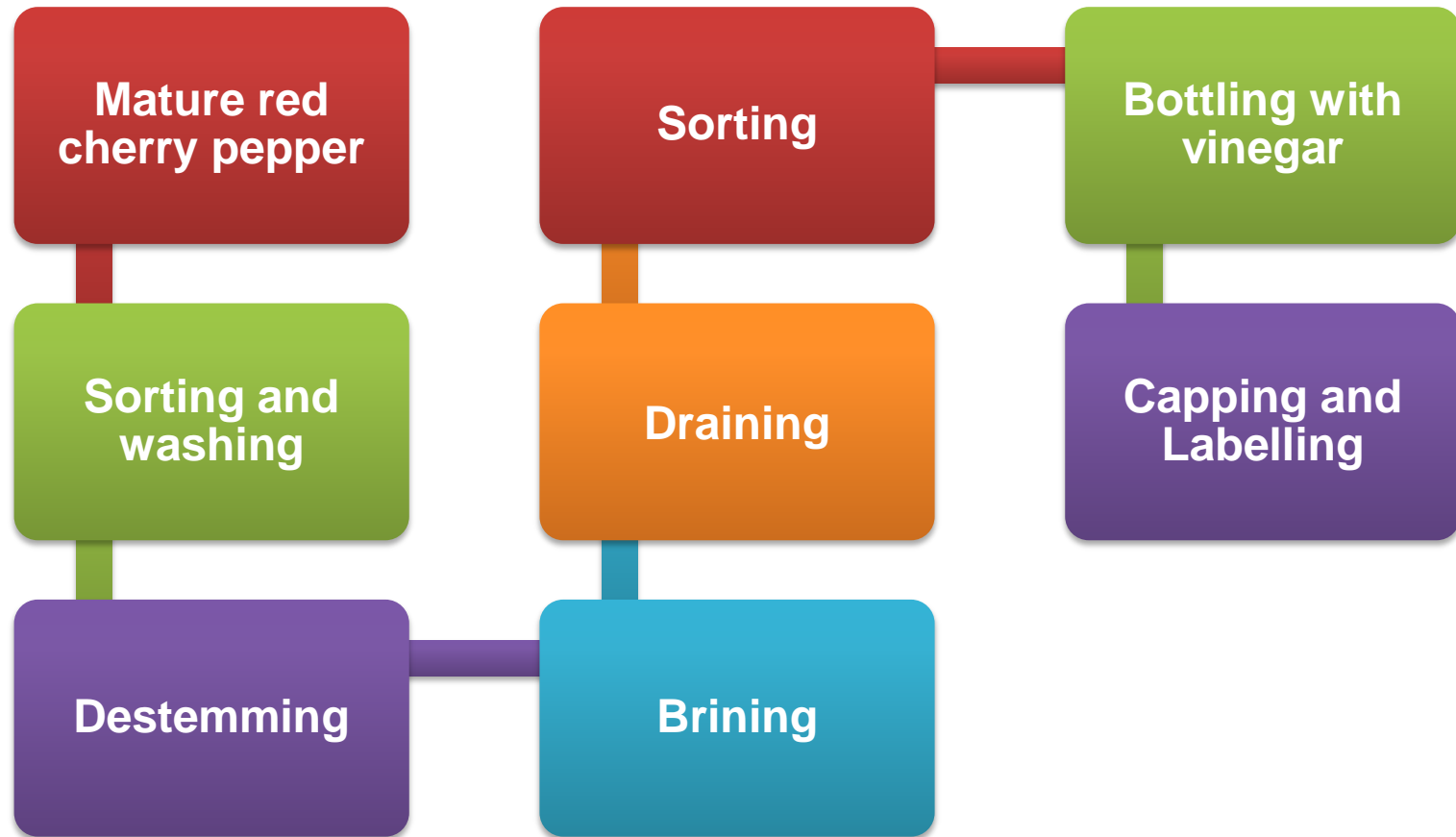


- ✓ **a. Processing part** - It can be isolated into coarse processing and fine processing part. Crude material is processed by relative-move rollers, chilli color won't be changed by high working temperature.
- ✓ **b. Filtering part** - It receives Quantitative screw transport to take care of, taking care of speed can be changed. In coarse plant machine, chilli will be broken by turning hammer, at that point material will be lifted to filtering machine to filter and grade.
- ✓ **c. Residue gatherer** - This plant receives yearning transmission, fixing impact is superb, dust is sifted by high pressing factor beat deduster, this generally brought down the sharp smell and residue, working climate is grown significantly.

## PICKLES

- Pickling is one of the oldest and most successful methods of food preservation
- Pickle quality depends on many factors:
  - Maintenance of proper acidity
  - Salt concentration
  - Temperature
  - Sanitary conditions
- They are eaten as a savoury, spicy accompaniment to a meal
- Pickles generally has a pungent, sweet-sour flavor
- Pickles serve as appetizers and help in digestion by aiding flow of gastric juices
- Pickles are preserved by a combination of increased acidity (reduced pH), added salt, reduced moisture and added spices.

# PROCESS FLOW CHART FOR RED CHERRY PEPPER VINEGAR PICKLE



## BRINING AND DRAINING

- It refers to soaking of cleaned cherry peppers in brine/salt solution
- Salt removes water from the chillies by osmosis
- Non-iodized common salt is suitable.
- The iodine in table salt darkens pickles.
- Salt that contains chemicals to reduce caking should be avoided as the chemicals will make the brine cloudy.
- Destemmed chillies are dipped in 5% brine solution for 2-3 days
- After 2-3 days, only plump and whole *dalley* are taken out from the brine.

# PROCESS FLOW CHART FOR RED CHERRY PEPPER OIL PICKLE



## MIXING

- Brined peppers are drained and mixed with spices.
- **Commonly used spices are:**
  - Turmeric powder
  - Mustard seeds
  - Fennel seeds or *saunf*
  - Carom seeds or *ajwain*)
  - Oil
- Spices used should be good quality, clean and free of mould and insects.
- They can be roasted or fried before adding to the pickle mixture.
- Vegetable oil is added to the pickle.
- It is often mixed with the spices to make a paste.
- Top quality vegetable oil (mustard oil) is used.

## COMPOSITION OF CHERRY PEPPER VINEGAR PICKLE

Ingredients	Quantity
Cherry pepper	100 kg
Salt	1.7 kg
Water	50 litre
Vinegar	1 litre

## COMPOSITION OF CHERRY PEPPER OIL PICKLE

Ingredients	Quantity
Cherry pepper	100 kg
Salt	10 kg
Mustard Oil	4 litre
Mustard seeds	3 kg
Carom seeds/ ajwain	300 g
Turmeric powder	300 g
Fennel seeds/saunf	700 g
Vinegar	800 ml

## QUALITY OF RED CHERRY PEPPER PICKLE

Type of pickle	Parameters	Limits
Oil pickle	Drained Weight	Not less than 60.0 percent
	Fruit and Vegetable pieces shall be practically remaining submerged in oil	
Vinegar pickle	Drained Weight	Not less than 60.0 percent
	Acidity of vinegar as acetic acid	Not less than 2.0 percent



**Cherry pepper vinegar pickle**



**Cherry pepper oil pickle**





सत्यमेव जयते

## **EXPORT POTENTIAL FINISHED PRODUCTS**

- High demand for organic products due to increased health concerns and awareness
- Chilli powders have their niche market both in India and globally.
- Pickles are most suitable for small-scale manufacturers.
- Pickles can be made using relatively simple equipment that is readily available in most places.



## **CONTACT DETAILS**

**National Institute of Food Technology Entrepreneurship and Management  
Ministry of Food Processing Industries  
Plot No.97, Sector-56, HSIIDC, Industrial Estate, Kundli, Sonipat, Haryana-  
131028**

**Website: <http://www.niftem.ac.in>**

**Email: [pmfmecell@niftem.ac.in](mailto:pmfmecell@niftem.ac.in)**

**Call: 0130-2281089**