Ministry of Food Processing Industries
Government of India

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Reading Manual for Coriander Powder

Under PMFME Scheme

National Institute of Food Technology Entrepreneurship and Management

Ministry of Food Processing Industries

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ABBREVIATIONS & ACRONYMS

Sr: No.	Abbreviations &Acronyms	Full Forms
1.	APEDA	Agricultural and Processed Food Products Export Development Authority
2.	FAO	Food and Agriculture Organization
3.	FBO	Food Business Operator
4.	FLRS	Food Licensing and Registration System
5.	FPOs	Farmer Producer Organizations
6.	FSSAI	Food Safety and Standards Authority of India
7.	kcal	kilocalorie
8.	MoFPI	Ministry of Food Processing Industries
9.	PA	Polyamide
10.	PET	Polyesters
11.	PFA	Prevention of Food Adulteration
12.	SHGs	Self Help Groups
13.	UAE	United Arab Emirates
14.	UK	United Kingdom
15.	US	United States
16.	WVTR	water vapor transmission rate

CHAPTER 1
INTRODUCTION

1.1. Industrial Overview:

Indian Spices

India is the largest producer of spices in the world. India produces a variety of spices. spices are cultivated in different climates in various parts of the world. Others were imported from similar climates and have been locally grown for centuries since then. A refined grain has had the bran and germ removed, leaving just the endosperm. Some examples of Indian spices include pepper, turmeric, cardamom, and cumin. In various ways, spices are used: whole, chopped, ground, roasted, sautéed, fried, and as a topping.

To extract the nutrients, they mix food and attach them into a palatable form. Some spices are added as flavorings at the end, which are usually heated before being added to a dish in a pan with ghee or cooking oil. Lastly, lighter spices are added, and spices with a heavy flavor should first be added. Flavors come with seasoning, and daily foods become luscious in taste.

Each spice has a distinct texture, unique aroma and enhancing characteristics that bring out the best of the ingredients and make delicious food. India, regarded as the birthplace of spices, boasts a long tradition of trade with Rome and China's ancient civilizations. Today, given their exquisite fragrance, texture, taste and medicinal value, Indian spices are the most sought in the global standards. In the world, India has the largest domestic spice market.

Traditionally, spices in India have been grown in small land holdings, with organic farming gaining prominence in recent times. The most significant seed spice crop is coriander (Coriandrum sativum). Both the fresh herb and spice seeds, which are used mainly for culinary purposes, are provided by the coriander plant. Spices (seeds) are widely used as

condiments with or without roasting in the preparation of curry powders, sausages, and seasonings.

It is an important ingredient in baked products, meat products, soda & syrup, puddings, cookies, preserves, and liquors in the manufacture of food flavoring. It also uses the preparation of either steam-distilled essential oil or oleoresin derived from solvents. Both products are used in the flavoring and scent industries.

1.2. Product Description:

Coriander is an annual herb that grows with branching stems and small white, pinkish flowers to a height of about 90cm. It is a member of the same family (Umbelliferae) and is native to the Mediterranean and the Middle East as carrots and parsley.

Coriander is cultivated for its seeds and leaves, also known as Chinese cilantro and parsley, both of which are used in a variety of dishes.

Mature brown seeds should be used to ground the powder. Seed heads are cut along with some inches of the stalk or the plant can be taken out with roots and hung in bags upside down, when the seeds are completely dry they begin to detach from the stalk, collected, and stored in a cold, dry place or grind to obtain the fine powder. Its ground powder is used as a seasoning in mixtures. Coriander powder used to spice a range of items such as seafood, sodas, pickles, bakery, and curry recipes. Coriander powder and its essential oil are known as natural food preservatives, including antibacterial, antifungal, and antioxidant properties.

1.3. Market Potential:

The demand for vegetarian and non-vegetarian recipes to be packed with flavorful and medicinal qualities has not only increased in the Indian market for Indian spices but also internationally. Their use in the cosmetics industry has increased in record quantities in recent years. In 2019-20, exports of Indian spices and spice products increased to Rs 21,515.4 crore (USD 3033.44 million) and an amount of 11,83,000 tonnes, retaining their strong demand facing rigid competition in foreign markets. India exported a total of 11,00,250 MT of spices and spice items during the preceding year of 2018-19. This means that from 2018-19, in quantity words, 2019-20 saw a 7.52 percent raise. In rupee terms, exports of spices increased

10 percent from Rs 19,505.81 crore in 2019-20 and growth was 8 percent in dollar terms.(APEDA) . It is one of mankind's first recognized produce that has originated in the Mediterranean and eastern regions. The oldest spiced coriander was found in Israel's Nahal Hemar cave. It is considered that they are over 8,000 years old. Some Sanskrit (Sand script) texts speak of the cultivation of cilantro almost 7,000 years ago in ancient India, although there are only a few plant fossils to back up the literature.

Coriander powder is produced mainly in Argentina, India, Morocco, Romania, Russia, Spain, Yugoslavia, France, Italy, the Netherlands, Burma, Afghanistan, Pakistan, Turkey, Canada, Mexico, Bulgaria, and, to a certain extent, in England, Canada, and the USA. It is estimated that global coriander seed production is around 6 lakh tonnes. Furthermore, coriander is widely grown on a small scale in home gardens, which is never included in official statistics. India is the largest manufacturer and exporter of coriander Powder in the world, with annual production averaging about 3 lakh tonnes (Raw). The Indian share is 80%, Morocco 4.7%, Bulgaria and Canada 3.75%, Romania 3.12%, China 2.2%, and Syria 2.5% each. Production fluctuates dramatically between years, ranging from less than 2 lakh tonnes to more than 4 lakh tonnes this decade. The world's two biggest producing states are Madhya Pradesh and Rajasthan, adding more than two-thirds of the country's total production. The other growers are Gujarat, Assam, Andhra Pradesh, Karnataka, Orissa, and Tamil Nadu. Coriander is cultivated as a rabi crop for seed cultivation, with sowing from October to November and new crop deliveries seen from February to March. From the southern states of India, Delhi is the major domestic buyers of coriander powder. The spice processing agencies that consume about 50 percent of the products are mainly based on coriander powder. The demand from this industry peaks from April to June, which also coincides with the peak arrival season.

1.4. Raw Material Description:

Within 90 to 135 days, the coriander crop matures. When the central umbels are about to reach yellow colour, the stage of maturity of the spices is the stage of harvest. To prevent shedding losses, the correct harvesting time is in morning hours. The traditional culinary use of coriander seed is in curry powders, where a crunchy texture is given by the bulkiest constituent, often rough ground in India. The seeds can also be used in soups and stews. Coriander, used in cakes, breads and other baked goods, is

an ingredient in garam masala, pickling spices and pudding spices. A typical sweetmeat and breathing sweetener are sugared comfits made from the seeds. In the treatment of digestive disorders, medicinal coriander is a precious herb. In the treatment of indigestion, nausea, dysentery, hepatitis and ulcerative colitis, one or two teaspoons of coriander juice, added to fresh buttermilk, are highly beneficial. For treating Typhoid fever, it is also helpful. Dry coriander, being helpful in acidity, treats diarrhoea and chronic dysentery. A remedy for abdominal pain due to indigestion can be cured by having chutney made from dry cilantro, green chillies, grated coconut, ginger and black grapes without seeds. As it is a good diuretic and stimulates the kidneys, regular drinking of coriander water helps lower blood cholesterol. The seeds of Coriander monitor excessive menstrual flow. A decoction made from freshly dried cilantro is an excellent conjunctivitis eye-wash. This alleviates burning and decreases pain and swelling. As a food flavouring, seed oil is used in perfumery, soap making, etc. It has fungicidal and bactericidal properties as well. The growing plant repels aphids and the spray extract of coriander leaves is also very effective against red spider mites and woolly aphids.

1.5. Types of Raw Material:

As the coriander seed is the only raw material is the coriander powder processing it is important to selection of suitable variety. The different majorly cultivated varieties are given below table:

Sl. No.	Varieties	Description
1.	Sadhana (CS-4)	▪ Medium duration variety ▪ Suitable for grains as well as leaf purposes. ▪ Bushy nature grows up to a height of 70 cm. ▪ Resistant to aphids ▪ Performs well in moisture-retentive black soils. ▪ Yields 1000 - 1100 kg per hectare.
2.	Sindhu (CS-2)	▪ Short duration variety (80-85 days). ▪ Escapes powdery mildew ▪ yield 900 kg/ha
3.	Sudha (LCC-128)	▪ Medium duration variety (95-100 days) ▪ The grain is medium in size

		▪ The yield of 1050 kg/ha.
4.	Swathi (CS-6)	▪ Medium duration variety (80-98 days) ▪ Oblong shaped seed, ▪ Yield 750-1200 kg/ha. ▪ Essential oil content is between 0.36 to 0.40 percent
5.	APHU Dhania-1 (LCC-170)	▪ Medium duration variety (85-90 days). ▪ Oblong shaped seed. ▪ Yield 850-1200 kg/ha. ▪ The essential oil content is 0.40 percent.
6.	Suguna (LCC-236)	▪ Medium duration variety (90-95 days. ▪ The grain is slender, oval-shaped. ▪ Yield up to 750-1350 kg/ha. ▪ High in volatile oil content (0.52 %).
7.	Suruchi (LCC-234)	▪ High yielding leaf variety. ▪ Off-season variety ▪ Yield of 15 – 18 t/ha of grain(ravi) ▪ Volatile oil content is 0.15%.
8.	Susthira (LCC-219)	▪ High yielding variety ▪ Duration (85 – 90 days), ▪ Suitable for rain-fed areas. ▪ Yield 1200-1400 kg/h ▪ High volatile oil content (0.59%).

CHAPTER 2
PROCESS & MACHINERY REQUIREMENT

2.1. Raw Material Aspects:

Coriander is a flowering plant that belongs to the Parsley family, Coriander, which goes by the botanical name *Coriandrum sativum*, is native to Southern Europe, North Africa, and West Asia. Coriander is an aromatic spice, popularly referred to as Dhania. Coriander powder is obtained from these coriander plant seeds. The fruit is globular, 3 to 4 mm in diameter, and splits into two locules of one seed each when pressed. To sweet and savory food recipes, it gives a slight flavor and fragrance. Seeds are completely dried and crushed to form a powder.

2.2. Source of Raw Material:

In India, approximately 80% of the world's total coriander seed is produced. India is the largest producer, consumer, and exporter of spices in the world among these, one of the most important spices is coriander seed.

In the year 2020, Madhya Pradesh produced the largest amount of coriander seeds, Rajasthan is the second-largest, and Gujarat is India's third-largest producer of coriander seeds. In 2020, the annual production of coriander seeds for that year was over 755,000 metric tonnes. The coriander is also cultivated in Assam, Haryana, Maharashtra, Uttar Pradesh, Bihar, Telangana, and Chhattisgarh in large areas. The Raw material can be procured directly from the producer, local vendor. Contract farming can become the second option for raw material availability.

2.3. Technologies:

Traditional method

Harvested plants are dried in the sunlight for 1-2 days to bring the moisture levels down to 18%. This dried plant is then thrashed to remove the seeds. Storage of raw Coriander is subject to infestation by rodents and pests. Fumigation systems are used to reduce insect pest infection. Cleaning is done through a wind-based separator.

Seeds are further dried in the shade to bring the moisture levels down to 9%. The second drying stage should be in the shade to prevent over-heating of the seeds. Traditionally, grading has been done through sieves by labourers. Traditional Chakki has lower yield efficiency which leads to a loss in form of ground powder. Packaging of coriander was in polybags.

Disadvantage of the traditional method

- Neither the buds/ immature grains effectively separated nor are the infected grains removed all adversely affecting the quality of the end product.
- The manually grinding process leads to dis-uniform grades that differ in color and shape.
- They even create pollution in form of dust and a lot of sounds.
- That were neither hygienic nor with sufficient shelf life of processed powder.

Modern method

Modern technology involves raw material storage in silos made of galvanized steel re-enforced exteriors. The Silos offer a hygienic environment that prevents quality and hygiene deterioration. This enables units to target premium markets from quality-seeking consumers through direct retailing and export. This method involves Pre-Cleaner, Gravity Separator Currently; there are modern machines like color sorters available for grading the coriander seeds not only on the basis of shape and size but also shape. In the post-harvest processing of spices, grinding is one of the most important unit operations that need careful consideration, since it includes the additional problems of volatility and aroma loss. Many spices have a distinctive aroma, and so their real worth as a spice is due to the etheric oils that make up the main spice component. This oil contained in oil cells or matrix and can only be made usable after grinding. The latest type of pulverizer includes classified material is conveyed into the

cyclone for collection and bagging. The packaging is involved this pouch is developed using quality materials. These pouches are developed by ensuring high durability and better design.

2.4. Manufacturing Process:

For exporting the seed spices, quality is the most important criterion. The quality of seed spices is assessed by mean of its intrinsic (Moisture, volatile oil, oleoresins content, major chemical constituents) as well as extrinsic (size, appearance, colour) quality. The right time of coriander harvesting is very important activities in the prospect of quality of coriander powder production. Some of the processes involved in between harvesting and delivery to processing plant.

Stage of the harvest:

The crop of coriander matures in 90 to 135 days. The stage of maturity of the fruit at harvest is when central umbels are about to attain yellow color. The right time harvesting is usually in the morning hours to avoid shedding losses.

- **Sun Drying:**

Sun drying is a conventional drying process used to decrease the moisture content of coriander by spreading plants under the sun. Solar radiation heats up the plant as well as the surrounding air and thereby increases the amount of evaporation of water from coriander seed.

- **Threshing of seed spices:**

After proper drying, the coriander plant is taken to threshing process. traditionally the threshing of seed spices is performed by treading the crop under the tire of a tractor or by stick beating and then the threshed stocks are cleaned by winnowing in the natural air stream or in the artificial air streaming the processed products. Nowadays the thrasher is invented that reduced the physical losses of seeds.

[All the steps until this point are pre-processing plant stages, thus are usually performed by farmers or vendors themselves]

- **Cleaning/Grading:**

Various machines are used for special functions. Magnet drum/pulley is used to separate iron particles. Vibro separator is being used to separate identical weed seed from the product. Electronic color sorters are used to separate discoloured seeds to enhance the color value of the final product. A gravity separator can also be used to separate undesirable material on the basis of weight.

- **Seed Roasting/Drying:**

The typical aroma and flavor of coriander seed are not fully developed until it is completely dry. Seed roasting machines are used to dry seeds. It is necessary to ensure that the drying temperature does not reach 100 ° C, as this decreases the amount of volatile oils

Grinding:

The process is the final stage where the dried seeds of coriander are grounded and turned into a fine powder which is further processed by Pulverizing.

Pulverizing:

It's a type of grinding process which grinds the given product to very fine sized powder. A dust collector is provided in the system for ensuring dust less operation and for no loss of ground powder.

Packaging:

The finished product is then packaged and stored for supply.

2.4. Flow Chart:

Steps	Machine and Equipments	Description	Machine Image
Storage	Silos	These Equipments are class of storage Equipments which are specifically designed for dry grain raw material of small granule composition. It is used to store grains.	
De-Stoning	De-Stoner	This machine is applied for the efficient separation of stones and metal, glass, and other high- density impurities from a stream of grain.	
Weed cleaning	.Vibro separator	Vibro separator is being used to separate identical weed seed from the product.	
Drying/ Roasting	Coriander seed roasting machine	This machine is used for Coriander seed roasting, machine uses an advanced drum plus copy board structure.	
Grinding	Powder grinding machine	The powder grinding machine is primarily used For food, herbs, coriander powder, resin powder, powder, chemicals, pharmaceuticals, and other weak electrical substances	

Pulverizing	Pulverizer	A pulverizer is a mechanical device used for pulverizing, crushing, and grinding a wide variety of materials to varying finesses.	
Packaging	Automatic Pouch Filling & Packaging Machine	This Machine is used for filling of coriander powder in different volumes pouches as per setting followed by sealing them.	

2.5. Additional Machine & Equipment:

Machine and Equipments	Used	Machine Image
Drum Sieve	A quality drum sieve machine is used for removing large impurities from coriander seeds at high capacities. Careful preliminary cleaning reduces the wear and tear on the downstream equipment in the production process.	
Food Grade Conveyor	These are conveyors with food grade belt to maintain food safety standards set by monitoring authorities.	

2.6. General Failures & Remedies:

S. No.	General Failures	Remedies
1.	Ball bearing failure of various machine	1. Proper periodic lubrication of all bearings in various machines. 2. Regular replacement of all bearing to prevent critical failures.
2.	Power Drive Overload	1. Ensure proper weighing & metering specially in case of semi-automatic plant. 2. Install warning sensor in buffer region of loading capacity to ensure efficient operation.
3.	Mechanical Key Failure	1. Ensure that mechanical keys are replaced as per there pre-defined operational life. 2. Prevent Overloading.
4.	Loss of Interface	1. This problem is dominant in newly established automatic plant, one must learn to maintain rules in plant & ensure no employee goes near transmission lines, unless authorised. 2. Provide proper physical shielding for the connections.
5.	Improper Sieving (Optical Sorters)	1. This problem fundamentally occurs due problem with optical sensors. 2. The solution involves cleaning the optical surface & if problem persists replacing the sensor.

2.7. Nutritional Information:

Health benefits of Coriander powder

- Help lower blood sugar.
- Rich in immune-boosting antioxidants.
- Beneficial for heart health
- Protect brain health.
- Promote digestion and gut health.
- Fight infections.
- Protect skin.
- Easy to add to the diet.

Some side effect of coriander powder

- Coriander can cause allergic reactions.
- Symptoms of such reactions can include asthma, nasal swelling, hives, or swelling inside the mouth.
- These reactions appear to be most common in people who work with spices in the food industry.

The following data on coriander seeds nutrition is accurate for a serving size of 100g

Calories	**Net Weight**
Total Fat	0.5g
Sodium	46mg
Total Carbohydrate	3.7g
Dietary Fibre	2.8g
Sugar	0.9g
Protein	2.1g
Calcium	67.00mg
Iron	1.77mg
Potassium	521mg[i]

2.8. Export Potential & Sales Aspect:

Not only has the need for Indian spices used worldwide, expanded the market for vegetarian and non-vegetarian recipes to be packed with flavourful and medicinal qualities, but this year their use in the cosmetics industry has risen in record quantities. Total exports of spices from India totalled 1.08 billion kilograms, valued at US$ 3.11 billion in 2017-18. The US, China, Vietnam, Hong Kong, Bangladesh, Thailand, UK, UAE, Malaysia, and Sri Lanka were the top 10 importers of Indian spices from Apr-Oct 2018. The production of global coriander seeds is estimated at about 6 lakh tonnes. In addition, in-home gardens, coriander is widely grown on a small scale and is rarely listed in official figures. The primary foreign vendors are India, Morocco, Canada, Romania, Russia, and Ukraine. The other dealers include Iran, Turkey, Israel, Egypt, China, the USA, Argentina, and Mexico. With an average annual production of about 3 lakh tonnes, India is the largest producer, consumer, and exporter of coriander powder in the world. The Indian share of coriander powder is 80 percent, Morocco 4.7 percent, Bulgaria and Canada 3.75 percent, Romania 3.12 percent, China 2.2 percent, and Syria 2.5 percent. In India, coriander was grown in an area of 540700 hectares with a total output of 511760 tonnes during 2011-12, of which 28100 tonnes were exported. The major domestic buyers of coriander seed in India are spice processing agencies, which consume around 50% of the production are mostly located in the southern states of India and Delhi. The demand from this sector peaks from April to June, which also coincides with the peak arrival period.

CHAPTER 3
PACKAGING OF CORIIANDER POWDER

3.1. Shelf Life of coriander Powder:

Dried coriander gives a lot of flavour to our dishes and is so easy to use and readily available. The preservation of coriander powder's consistency, freshness, and flavour will provide fantastic tasting dishes and help eradicate boring meals.

The spices do not spoil, but they lose their strength with time. Spices maintain their potency longer than you would expect if properly stored. Whole peppercorns, nutmegs, garlic, sticks of cinnamon, and whole seeds, including cilantro, cumin, and cardamom, all last longer than their ground counterparts.

Proper Storage

There are two critical keys to maintaining the optimum flavor and getting the greatest value out of your herbs and spices. Store your spices and seasoning blends in airtight containers and keep them in a cool dark place. Keeping containers tightly closed will protect them from moisture and oxidation. Keeping them away from direct light will keep their color from fading. We've also found that when spices are stored in glass jars they tend to retain more of their essential oil content.

Appropriate Storage

To preserve the optimal taste and get the best benefit of herbs and spices, there are two essential keys. Store spices in airtight containers and keep them in a cool dark place. They would be safe from moisture and decay by holding containers that will protect them from oxidation and spoilage. It'll protect their color from fading by keeping them hidden from the overt sun.it is observed that spices appear to maintain essential oil content when spices are kept in glass jars. Never store spices in a warm or humid place, as the extra heat can contribute to their quality deterioration more easily. Higher humidity will also shorten their shelf life as well. In temperatures below 70° and in conditions with lower humidity, stored spices perform well as shelf-life. The whole seeds keep the longest because they have not been cracked or ground which would expose their volatile oils to the air which speeds up the

breakdown of their flavor. This is why ground powder has a shorter shelf life than whole spices or seeds.

If the coriander is kept in proper storage the shelf life of Seeds is 2 - 3 years and Ground powder and herb leaves can keep 1 year.

3.2. Coriander Powder Packaging:

The packaging material to be used must be carefully chosen, taking into account both practical and marketing specifications, in order to ensure the consistency of the spices during handling, transport, storage, and delivery. In general, the packaging specifications for spices are listed below:

- To protect the product from spillage and spoilage.
- To provide protection against atmospheric factors such as light, heat, humidity, and oxygen.
- The selected packaging materials should have high water vapor and oxygen barriers.
- The packaging material should have a high barrier property to prevent aroma/flavor losses and ingress of external odor.
- The volatile oil contained in the spice substance has a tendency to react with the packaging material's inner/contact layer, often leading to a greasy and sticky packet with the printed matter being smudged.
- Therefore, the wrapping material should be resistant to grease and oil and be compliant with the commodity.
- The packaging content should, in addition to the above practical specifications, have good machinability, printability and be readily available and disposable.

3.3. Type of Packaging:

Bulk Packaging: The conventional approach is to use gunny/jute bags with a size varying from 10kg to 70kg for the packing of whole spices. Jute bags can be supplied with a polyethylene loose liner container, or maybe without a liner. Often double gunny bags, particularly for whole seeds are also used. An inner polyethylene lining is provided with the double gunny sack. The consistency of the jute fabric used varies from one trader to the other with respect to the gram mage and the weave (ends/picks).

There is no standardization about the type of fabric used and its consistency. A number of jute fabrics are used, including hessian, lightweight DW, A-twill, hard Cee, etc. Some spice traders/packers have recently used alternative bulk packing media, such as woven plastic bags that can be laminated or supplied with a loose liner bag, and plastic liner bag multiwall paper sacks. To overcome the toxicity issues associated with jute, plastic-based alternative wrapping materials are used. In comparison, the plastic bags/liners often help to maintain for a longer time the consistency of the spices packed inside.

Jumbo bags (Flexible Intermediate Bulk Containers) (FIBCs) for the export of spices are the new theme. These bags have a size of up to 1 tonne and have different benefits, such as:

- Bags are flexible, collapsible and durable
- It can be used to store granules, powder, flakes, and other free-flowing substance
- It is possible to prevent commodity waste/spillage and tampering.
- Since handling is mechanized, less labor is required.
- Time saved for loading and unloading
- Bags are low in weight and freight rates are also minimized.
- Creates an eco-friendly working environment free of emissions

Institutional packaging: Spice traders also make use of institutional power packs ranging from 2 kg to 10 kg. The range of packets used includes lightweight laminated pouches and woven plastic sacks that replace conventional materials such as tinplate containers and jute bags.

Consumer Packages: The possibilities open to spice traders/exporters when selecting a consumer pack for the domestic and export market are very large. The choice of the packaging material, however, depends on a number of factors, which are listed broadly below:

- ✓ Shelf-life duration, i.e. the degree of protection required by the commodity against pick-up of moisture, preservation of aroma retention, decoloration, etc (this is more critical in the case of powdered spices)
- ✓ During packaging, transportation, and delivery, environmental conditions
- ✓ Business type/sector
- ✓ Preferences for users
- ✓ Printability and appeal of aesthetics

The package types generally used as consumer packs are:

- ✓ Glass bottles of various sizes and shapes with labels and provided with metal or plastic caps. The plastic caps have added inbuilt features of tamper evidence, dispensing, grinding, etc.
- ✓ Printed tinplate container with/without dispensing systems
- ✓ Printed tinplate container with/without dispensing systems
- ✓ Plastic containers with plugs and caps with dispensing and tamper evidence features
- ✓ Printed flexible pouches – pillow pouch, gusseted pouch, stand-up pouch.
- ✓ Lined cartons

3.4. Material of Packaging:

Due to their simple availability, excellent printability, lightweight, machinability, and cost-effectiveness printed flexible pouches have recently become quite popular. The laminate/film may also be customized to serve a particular purpose, depending on the practical and marketing criteria. The printed flexible pouches are generally laminates of various compositions. Some of the commonly used laminates are:

- ✓ Polyester/metallised polyester/LDPE
- ✓ BOPP/LDPE
- ✓ BOPP/metallised polyester/LDPE
- ✓ Polyester/Al foil/LDPE

Polyester and BOPP-based laminates are usually more common in the packaging of coriander powder and other spices due to its potential and characteristics of both of these two films. In general, the polyester used for lamination is 10 to 12μm thick. The film is good clarity with outstanding transparency, excellence, and printability thereby improving the sales appeal. The film has very low moisture and gas permeability and thus guarantees a long shelf life of the contents of aroma, flavor, and flavor retention.

It may be Heat sealable or non-heat sealable. The film has high yields, is stable under climate change, and has an outstanding moisture barrier. The film is glossy, crystal clear, and smooth and has high mechanical strength and non-contamination properties for food contact applications. The sealant coating of LD – HD or LDPE may be replaced by LLDPE. Co-extruded films can also be used. Flexible materials based on PVDC, EVOH and EVAL still need to be tested, since they are now on the market and have high barrier properties.

CHAPTER 4
FOOD SAFETY REGULATIONS AND STANDARDS OF CORIANDER POWDER

4.1. Introduction to FSSAI:

The Food Safety and Standards Authority of India (FSSAI) has been established under Food Safety and Standards, 2006 which consolidates various acts & orders that have hitherto handled food-related issues in various Departments. The FSSAI is responsible for setting standards for food so that there is one body to deal with and no confusion in the minds of consumers, traders, manufacturers, and investors. The Act aims to establish a single reference point for all matters relating to food safety and standards, by moving from multi-level, multi-departmental control to a single line of command.

Highlights of the Food Safety and Standard Act, 2006-

Various central Acts like Prevention of Food Adulteration Act, 1954 , Fruit Products Order , 1955, Meat Food Products Order , 1973, Vegetable Oil Products (Control) Order, 1947,Edible Oils Packaging (Regulation)Order 1988, Solvent Extracted Oil, De- Oiled Meal and Edible Flour (Control) Order, 1967, Milk and Milk Products Order, 1992 etc will be repealed after commencement of FSS Act, 2006.

The Act also aims to establish a single reference point for all matters relating to food safety and standards, by moving from multi- level, multi- departmental control to a single line of command. To this effect, the Act establishes an independent statutory Authority – the Food Safety and Standards Authority of India with head office at Delhi. Food Safety and Standards Authority of India (FSSAI) and the State Food Safety Authorities shall enforce various provisions of the Act.

Establishment of the Authority-

Ministry of Health & Family Welfare, Government of India is the Administrative Ministry for the implementation of FSSAI. The Chairperson and Chief Executive Officer of Food Safety and Standards Authority of India (FSSAI) have already been appointed by Government of India. The Chairperson is in the rank of Secretary to Government of India.

4.2. FSSAI Registration & Licensing Process:

According to Section 31(1) of Food Safety and Standards (FSS) Act, 2006,Every Food Business Operator (FBO) in the country is required to be licensed under the Food Safety & Standards Authority of India (FSSAI).

As per FSS (Licensing & Registration) Regulations, 2011, Licenses and Registrations are granted to FBOs in a 3 tier system

- Registration - for petty FBOs with annual turnover less than Rs 12 lakhs
- State license - for medium-scale food manufacturers, processor and transporters
- Central License - for large-scale food manufacturers, processor and transporters

FSSAI registration is done online on the FSSAI website through Food Safety Compliance System (FoSCoS)

- FoSCoS has replaced the Food Licensing and Registration System (FLRS).
- Petty food business operators are required to obtain FSSAI Registration Certificate
- "Petty Food Manufacturer" means any food manufacturer, whomanufactures or sells any article of food himself or a petty retailer, hawker, itinerant vendor or temporary stall holder (or) distributes foods including in any religious or social gathering except a caterer;

or

- Other food businesses including small scale or cottage or such other industries relating to food business or tiny food businesses with an annual turnover not exceeding Rs. 12lakhs and/or whose production capacity of food (other than milk and milk products and meat and meat products) does not exceed 100 kg/ltr per day

Any person or entity that does not classify as a petty food business operator is required to obtain an FSSAI license for operating a food business in India.

FSSAI License - two types - State FSSAI License and central FSSAI License

Based on the size and nature of the business, the licensing authority would change.

- Large food manufacturer/processors/transporters and importers of food products require central FSSAI license

- Medium-sized food manufacturers, processor and transporters requires state FSSAI license.
- License period: 1 to 5 years as requested by the FBO.
- A higher fee for obtaining FSSAI license for more years.
- If a FBO has obtained the license for one or two years, renewal may be done, no later than 30 days prior to the expiry date of the license.

4.3. Food Safety & FSSAI Standards & Regulations:

Food Standards

"2.9.7: Coriander (Dhania) 2.9.7.2 Coriander (Dhania) powder" Coriander (Dhania) powder means the powder obtained by grinding clean, sound, dried mature fruits of *Coriandrum sativum L*. It shall be in the form of rough or fine powder. It shall have typical aroma and shall be free from mustiness. It shall be free from mould, living and dead insects, insect fragments, rodent contamination; the powder shall be free from added colour, starch, and bleach or preservative.

It shall conform to the following standards:—

(i) Moisture - Not more than 9.0 percent by weight.

(ii) Volatile oil content on dry basis- Not less than 0.09 percent by v/w (weight per volume)

(iii) Total ash on dry basis - Not more than 7.0 percent by weight.

(iv) Ash insoluble in dilute HCl on dry basis- Not more than 1.5 percent by weight.

Microbiological parameters

(v) Salmonell - Absent in 25gm.[ii]

Food Safety

Part I - General Hygienic and Sanitary practices to be followed by Petty Food Business Operators applying for Registration

SANITARY AND HYGIENIC REQUIREMENTS FOR FOOD MANUFACTURER/ PROCESSOR/HANDLER

The place where food is manufactured, processed or handled shall comply with the following requirements:

1. The premises shall be located in a sanitary place and free from filthy surroundings and shall maintain overall hygienic environment. All new units shall set up away from environmentally polluted areas.

2. The premises to conduct food business for manufacturing should have adequate space for manufacturing and storage to maintain overall hygienic environment.

3. The premises shall be clean, adequately lighted and ventilated and sufficient free space for movement.

4. Floors, Ceilings and walls must be maintained in a sound condition. They should be smooth and easy to clean with no flaking paint or plaster.

5. The floor and skirted walls shall be washed as per requirement with an effective disinfectant the premises shall be kept free from all insects. No spraying shall be done during the conduct of business, but instead fly swats/ flaps should be used to kill spray flies getting into the premises. Windows, doors and other openings shall be fitted with net or screen, as appropriate to make the premise insect free The water used in the manufacturing shall be potable and if required chemical and bacteriological examination of the water shall be done at regular intervals at any recognized laboratory.

6. Continuous supply of potable water shall be ensured in the premises. In case of intermittent water supply, adequate storage arrangement for water used in food or washing shall be made.

7. Equipment and machinery when employed shall be of such design which will permit easy cleaning. Arrangements for cleaning of containers, tables, working parts of machinery, etc. shall be provided.

8. No vessel, container or other equipment, the use of which is likely to cause metallic contamination injurious to health shall be employed in the preparation, packing or storage of food. (Copper or brass vessels shall have proper lining).

9. All equipments shall be kept clean, washed, dried and stacked at the close of business to ensure freedom from growth of mould/ fungi and infestation.

10. All equipments shall be placed well away from the walls to allow proper inspection.

11. There should be efficient drainage system and there shall be adequate provisions for disposal of refuse.

12. The workers working in processing and preparation shall use clean aprons, hand gloves, and head wears.

13. Persons suffering from infectious diseases shall not be permitted to work. Any cuts or wounds shall remain covered at all time and the person should not be allowed to come in direct contact with food.

14. All food handlers shall keep their finger nails trimmed, clean and wash their hands with soap, or detergent and water before commencing work and every time after using toilet. Scratching of body parts, hair shall be avoided during food handling processes.

15. All food handlers should avoid wearing, false nails or other items or loose jewellery that might fall into food and also avoid touching their face or hair.

16. Eating, chewing, smoking, spitting and nose blowing shall be prohibited within the premises especially while handling food.

17. All articles that are stored or are intended for sale shall be fit for consumption and have proper cover to avoid contamination.

18. The vehicles used to transport foods must be maintained in good repair and kept clean.

19. Foods while in transport in packaged form or in containers shall maintain the required temperature.

20. Insecticides / disinfectants shall be kept and stored separately and `away from food manufacturing / storing/ handling areas.

4.4. Labelling Standards (Regulation 2.5 of FSS)

Labelling requirements for packaged food products as laid down in the Part 2.4 of the Prevention of Food Adulteration (PFA) Rules, 1955, and the Standards of Weights and Measures (Packaged Commodities) Rules of 1977, require that the labels contain the following information:

1. Name, trade name or description
2. Name of ingredients used in the product in descending order of their composition by weight or volume

3. Name and complete address of manufacturer/packer, importer, country of origin of the imported food (if the food article is manufactured outside India, but packed in India)
4. Nutritional Information
5. Information Relating to Food Additives, Colors and Flavors
6. Instructions for Use
7. Veg or Non-Veg Symbol
8. Net weight, number or volume of contents
9. Distinctive batch, lot or code number
10. Month and year of manufacture and packaging
11. Month and year by which the product is best consumed
12. Maximum retail price

Provided that — (i) the nutritional information may not be necessary, in case of foods such as raw agricultural commodities, like, wheat, rice, cereals, flour, spice mixes, herbs, condiments, table salt, sugar, jaggery, or non –nutritive products, like, soluble tea, coffee, soluble coffee, coffee-chicory mixture, packaged drinking water, packaged mineral water, alcoholic beverages or flour and vegetables, processed and pre- packaged assorted vegetables, flours, vegetables and products that comprise of single ingredient, pickles, papad, or foods served for immediate consumption such as served in hospitals, hotels or by food services vendors or halwais, or food shipped in bulk which is not for sale in that form to consumers.

Wherever applicable, the product label also must contains the following

The purpose of irradiation and license number in case of irradiated food. Extraneous addition of coloring material.

Non-vegetarian food – any food which contains whole or part of any animal including birds, fresh water or marine animals, eggs or product of any animal origin as an ingredient, not including milk or milk products – must have a symbol of a brown color-filled circle inside a brown square outline prominently displayed on the package, contrasting against the background on the display label in close proximity to the name or brand name of the food.

Vegetarian food must have a similar symbol of green color-filled circle inside a square with a green outline prominently displayed.

All declarations may be: Printed in English or Hindi on a label securely affixed to the package, or Made on an additional wrapper containing the imported package, or Printed on

the package itself, or May be made on a card or tape affixed firmly to the package and bearing the required information prior to customs clearance.

Exporters should review the Chapter 2 of the “FSS (Packaging and Labeling) Regulation 2011” and the Compendium of Food Safety and Standards (Packaging and Labeling) Regulation before designing labels for products to be exported to India. FSSAI revised the labelling Regulation and a draft notification to that effect was published on April 11, 2018, inviting comments from WTO member countries and the comments received are under review and the publication date remains unknown.

According to the FSS Packaging and Labeling Regulation 2011, “prepackaged” or “pre packed food” including multi-piece packages, should carry mandatory information on the label.

CHAPTER 5

OPPORTUNITIES FOR MICRO/UNORGANIZED ENTERPRISES

5.1. PM-FME Scheme:

Ministry of Food Processing Industries (MoFPI), in partnership with the States, has launched an all India centrally sponsored "PM Formalisation of Micro Food Processing Enterprises Scheme (PM FME Scheme)" for providing financial, technical and business support for up-gradation of existing micro food processing enterprises. The objectives of the scheme are :

I. Support for capital investment for up-gradation and formalization with registration for GST, FSSAI hygiene standards and UdyogAadhar;
II. Capacity building through skill training, imparting technical knowledge on food safety, standards & hygiene and quality improvement;
III. Hand holding support for preparation of DPR, availing bank loan and up-gradation;
IV. Support to Farmer Producer Organizations (FPOs), Self Help Groups (SHGs), producers cooperatives for capital investment, common infrastructure and support branding and marketing.

References

[i] https://www.nutritionvalue.org/Coriander_%28cilantro%29_leaves%2C_raw_nutritional_value.html

[ii] Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011 (FSSAI)