

PROCESSING OF CUMIN POWDER



AATMANIRBHAR BHARAT

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

Industrial Overview:

- India is the largest producer of spices in the world.
- spices are cultivated in different climates in various parts of the world.
- Traditionally, spices in India have been grown in small land holdings, with organic farming gaining prominence in recent times.
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- Cumin is one of the first minor spices known to be used by humanity.



Product Description:



- Cumin Powder is made by powdering dry roasted cumin seeds in a grinder, or ground cumin (also known as Jeera Powder).
- This homemade powder may seem ordinary, but it has the magical power to alter the taste of a drink or a dish completely.
- Cumin is derived from a flowering plant that is mainly grown in India, North Africa, and the Middle East, known as *Cuminum Cyminum*.
- These cumin seeds are dried and powdered and then used in various cuisines.

Market Potential:

- Cumin is one of the seed spices used most widely and is used by people all over the world.
- Cumin seeds are used as a spice for their distinctive aroma.
- Cumin plays a very important role in the Indian system of medicine.
- it is widely cultivated in India, China, Indonesia, Iran, Japan, Morocco, Southern Russia, Syria, and Turkey.
- Gujarat is the second largest Indian producer of cumin seeds after Rajasthan.
- Together, Rajasthan and Gujarat contribute about 90 percent of the country's output.

INTRODUCTION



Market Potential:

- Rajasthan and Gujarat were the only major Indian states that produced cumin.
- Gujarat produced nearly 330 thousand metric tons in the fiscal year 2020.
- The total production of cumin in this amounted to 546 thousand metric tons, over an area of 841 thousand hectares.
- The U.A.E., with its 23 percent share, was the largest importer of cumin, followed by the U.S.A., Egypt, the U.K., and Bangladesh.

Raw Material Description (Plant)

Cumin is a flowering plant in the family *Apiaceae*.

The cumin plant grows to 30–50 cm tall and is harvested by hand.

cumin is native to a territory including the Middle East and stretching east to India.

Each one seed contained within a fruit, which is dried is used in the cuisines of many cultures in both whole and ground form.



INTRODUCTION

Raw Material Description:

- The flavoring property of cumin is due to the basic aromatic oil, which can be easily distilled with steam
- The major compounds were cuminaldehyde (32.6%), p-cymene (14.7%), p-mentha 1,4 diene (13.5%) and beta-pinene (12.7%).

Cumin seed contains:

- 8% moisture
- 7% crude fibre
- 9.5% total ash
- 0.5% acid insoluble ash
- 2.3% to 4.8% volatile oil
- 25% total ether extract.

Types of Raw Material:

- Cumin has a variety of good varieties suitable for the recovery of various agro-climates.
- In various areas, specifically Rajasthan and Gujarat, there are several varieties released for cultivation.
- Some important varieties of cumin are RZ-19, RZ-209, RZ-223, Gujarat Cumin- 1, Gujarat Cumin -2, Gujarat Cumin -3, Gujarat Cumin -4, etc.



Raw Material Aspects :

- It is a medicinal plant annually, with a slender, glabrous branching stem, 20-30 cm in height and 3-5 cm in diameter.
- There are two or three sub-branches of each branch.
- There is a standardized canopy in each of the branches at the same height.
- The leaves are 5-10 cm long, pinnate or bi-pinnate, and contain leaflets similar to thread.
- Tiny, white, or pink flowers are turned into umbels. The lateral fusiform or ovoid achene 4–5 mm long, holding two mericarps and one single seed.
- India is the largest producer and buyer of cumin seed in the world.



Source of Raw Material:

- India is the largest producer and buyer of cumin seed in the world.
- It is projected that India accounts for 70% of the world's Production of cumin crops.
- A mild subtropical climate is suitable for the cultivation of cumin.
- The temperatures are fairly mild and dry.
- Cumin is grown in India primarily in western Indian countries such as Rajasthan and Gujarat.

Technologies:

Traditional methods

- Cleaning of seed 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 laborers.
- Traditional Chakki has lower yield efficiency which leads to a loss in form of ground powder.



Technologies:



Modern method

- This method involves Pre-Cleaner, Gravity Separator.
- There are modern machines like color sorters available for grading the cumin seeds not only on the basis of shape and size but also shape.
- 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.

Processing Process:

- For exporting the seed spices, quality is the most important criterion.
- The right time of cumin harvesting is a very important activity in the prospect of quality of cumin powder production.
- Some of the processes involved in between harvesting and delivery to processing plants.



Manufacturing Process:

Sun Drying:

Sun drying is necessary to remove the moisture from plants and seeds under the sun.

Threshing of seed spices:

After proper drying, the cumin plant is taken to the threshing process.

Traditionally the threshing of seed spices is performed by treading the crop by stick beating.

Nowadays the thrasher is invented that reduces the physical losses of seeds.



Manufacturing Process:



Cleaning/Grading:

- Various machines are used for special functions.
- Magnet drum/pulley is used to separate iron particles.
- A Vibro separator is being used to separate identical weed seeds from the product.
- Electronic color sorters are used to separate discolored 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.

Manufacturing Process:

Drying

The seeds are then further dried to 10% moisture content, whether by placing on mats or trays in the sun or by using a drier if the conditions are too humid.



Manufacturing Process:



Grinding:




- The process is the final stage where the dried seeds of cumin are grounded and turned into a fine powder which is further sent for packaging.

Packaging:



- The finished product is next packaged and stored for supply.

PROCESS & MACHINERY REQUIREMENT

Flow Chart:



Machine and Equipments	Description	Machine Image
Silos	<p>These Equipments are class of storage Equipments which are specifically designed for dry grain raw material of small granule composition.</p> <p>It is used to store grains.</p>	
De-Stoner	<p>This machine is applied for the efficient separation of stones and metal, glass, and other high- density impurities from a stream of grain.</p>	
Vibrating Pre- Cleaner	<p>Pre-cleaner to scalp oversize impurities from seeds.</p>	

PROCESS & MACHINERY REQUIREMENT

Machine and Equipments	Description	I
Powder grinding machine	The powder grinding machine is primarily used For food, herbs, cumin powder, resin powder, powder, chemicals, pharmaceuticals, and other weak electrical substances	
Automatic Pouch Filling & Packaging Machine	This Machine is used for filling of Cumin powder in different volumes pouches as per setting followed by sealing them.	

PROCESS & MACHINERY REQUIREMENT

Additional Machine & Equipment:

Machine and Equipments	Used	Machine Image
Drum Sieve	A quality drum sieve machine is used for removing large impurities from Cumin 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.	

General Failures & Remedies:

S. No.	General Failures	Remedies
1.	Ball bearing failure of various machine	<ul style="list-style-type: none"> Proper periodic lubrication of all bearings in various machines. Regular replacement of all bearing to prevent critical failures.
2.	Power Drive Overload	<ul style="list-style-type: none"> Ensure proper weighing & metering specially in case of semi-automatic plant. Install warning sensor in buffer region of loading capacity to ensure efficient operation.
3.	Mechanical Key Failure	<ul style="list-style-type: none"> Ensure that mechanical keys are replaced as per there pre-defined operational life. Prevent Overloading.

General Failures & Remedies:

S. No.	General Failures	Remedies
4.	Loss of Interface	<ul style="list-style-type: none"> ▪ 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. ▪ Provide proper physical shielding for the connections.
5	Improper Sieving (Optical Sorters)	<ul style="list-style-type: none"> ▪ This problem fundamentally occurs due problem with optical sensors. ▪ The solution involves cleaning the optical surface & if problem persists replacing the sensor.

Nutritional Information:

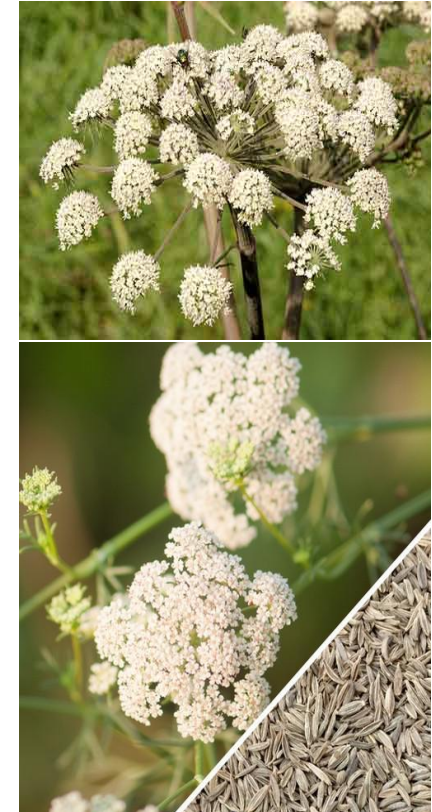
S .No.	The nutritional value of cumin seeds per 100 g contains:	
1.	Energy	370 kcal
2.	Carbohydrates	44.24 g
3.	Dietary Fiber	10.5 g
4.	Fat	22.27 g
5.	Protein	17.81 g
6.	Thiamin (Vit. B1)	0.628 mg
7.	Riboflavin (Vit. B2)	0.327 mg
8.	Niacin (Vit. B3)	4.579 mg
9.	Vitamin B6	0.435 mg
10.	Vitamin C	7.7 mg



PROCESS & MACHINERY REQUIREMENT

Nutritional Information:

S .No.	The nutritional value of cumin seeds per 100 g contains:	
11.	Vitamin E	3.33 mg,
12.	Calcium	931 mg,
13.	Iron	66.36 mg,
14.	Magnesium	366 mg,
15.	Phosphorus	499 mg,
16.	Potassium	1788 mg,
17.	Sodium	168 mg,
18.	Zinc	4.8 mg,



Export Potential & Sales Aspect:



- Cumin is produced mostly in countries such as India, Syria, Iran, and Turkey, and is the world's major producers of cumin.
- In those countries, there are a majority of cumin producers and cumin exporters.
- India grows up to 70% of the world's cumin seeds.
- India is the largest source of spice for cumin seeds.
- The United Arab Emirates are the world's leading importers of cumin powder from various areas of the world.
- Vietnam (\$105 million), the US (\$44.3 million), Bangladesh (\$37.1 million), Egypt (\$24.3 million) and Egypt (\$23.4 million) are the major importer of cumin powder and seed.

The objectives of the scheme are:

- Support for capital investment for up-gradation and formalization with registration for GST, FSSAI hygiene standards and Udyog Aadhar;
- Capacity building through skill training, imparting technical knowledge on food safety, standards & hygiene and quality improvement;
- Hand holding support for preparation of DPR, availing bank loan and up-gradation;
- Support to Farmer Producer Organizations (FPOs), Self Help Groups (SHGs), producers cooperatives for capital investment, common infrastructure and support branding and marketing.
- <https://mofpi.nic.in/pmfme/docs/SchemeBrochure1.pdf>

CONTACT DETAILS



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