

# Entrepreneurship Development in Spice Processing

**DR. E. JAYASHREE, DR. T. JOHN ZACHARIAH**

Principal Scientists, Division of Crop Production & PHT,

ICAR - Indian Institute of Spices Research, Marikunnu P. O., Kozhikode 673012, Kerala

Ph:0495-2731410, Fax: 2731187, Mob:9446071410, Email: john@spices.res.in, zacjohntj@gmail.com

India is the home of spices. From the farmlands of India, comes a wide variety of spices like black pepper, cardamom (small and large), ginger, garlic, turmeric, chilli, etc. It is the largest producer, consumer and exporter of spices and spice products. Out of the 109 spices listed by the ISO, India produces as many as 75, thanks to its varied agro climatic regions. Almost all the States and Union Territories of the country grow one or the other spices.

In the World Spice Trade, India has a solid 48% of the global export volume and 44% of the export value to its credit. It exports more than 0.40 million tons of spices annually. Due to liberalization of Indian economy, the spices industry of India has grown very rapidly. It is a source of livelihood and employment for large number of people in the country, especially for rural population. All these underline the prominent position that India holds in the world spice production. Entrepreneurs from all over the world are exploring the opportunities in this area. The government has also undertaken several measures and initiatives for the development of the spices industry within the country.

## Establishment of Incubation

ICAR-Indian Institute of Spices Research has established the Spice Processing Facility at its Experimental Farm at Peruvannamuzhi, Kozhikode during 2013-14. It was setup with

the objectives of encouraging research and entrepreneurship development in spice processing for product and process development. This facility was established to attract entrepreneurs in spice sector by developing integrated processing facilities, hand-holding entrepreneurs, providing training and technical guidance on post-harvest operations and quality maintenance of major spices.

The processing unit is equipped with state-of-the-art facility for primary as well as secondary processing of spices. The facility has three units, each for cleaning and grading black pepper, curry powder production and white pepper production. The facility has also obtained the "Manufacturing license" from FSSAI (Food Safety and Standards Authority of India) for commercial production of cleaned and graded black pepper, white pepper and spice powders.

## i. Black Pepper

### Cleaning and Grading Unit

The pre cleaning equipment installed in the black pepper cleaning cum grading unit includes a black pepper cleaner cum grader, spiral separator and a metal detector. Fully matured green pepper is harvested when one or two berries in the spike turn orange red. The berries are separated from spike using a thresher and the separated berries are dried

in the drying yard for about five days. In this process, there are chances of contamination by dust, dry leaves, sticks and other foreign matters. It is therefore necessary to clean black pepper before it is packaged and used for consumption. The capacity of the cleaner cum grader, spiral separator and the metal detector is 200 kg/h. Once the black pepper is cleaned, it is graded according to size and then packaged in clean gunny bags. The machineries for black pepper cleaning and grading unit installed at ICAR-IISR listed in Table 1.

**Table 1 Machineries for a black pepper cleaning and grading unit**

| S. No        | Machineries            | Capacity    | Cost, Lakhs  |
|--------------|------------------------|-------------|--------------|
| 1.           | Cleaner cum grader     | 200 kg/h    | 5.50         |
| 2.           | Spiral separator       | 200 kg/h    | 2.50         |
| 3.           | Metal detector         | 200 kg/h    | 1.25         |
| 4.           | Filling machine        | 200 kg/h    | 4.50         |
| 5.           | Continuous band sealer | 150 packs/h | 0.30         |
| 6.           | Weighing machine       | 100 kg      | 0.50         |
| <b>Total</b> |                        |             | <b>14.55</b> |

**ii. White Pepper**

**Production Unit**

White pepper is produced from fully-matured freshly-harvested green pepper or from black pepper. The freshly harvested green pepper spikes are despiked/ threshed using a pepper thresher and the berries are graded in a rotary grader. Berries of size 4.0 mm and above are used for white pepper production.

The fresh berries are washed in the drum washer and introduced into the fermentation tank where the pepper is fermented, with daily change of water in the tank. After required days of fermentation, the fermented pepper is fed into the pulper-cum-washer for the removal of outer skin.



**Fig. 2 White pepper production Unit**

The white pepper so obtained is washed and dried for a period of 2-3 days in the solar tunnel drier. The dried white pepper is cleaned, graded and packaged for commercial use. The machineries installed in the white pepper production unit at ICAR-IISR are listed in Table 2.

**Table 2 Machineries for a white pepper production unit**

| S. No.       | Machinery           | Capacity     | Cost, Lakhs  |
|--------------|---------------------|--------------|--------------|
| 1.           | Drum washer         | 200 kg/h     | 2.50         |
| 2.           | Fresh pepper grader | 200 kg/h     | 2.00         |
| 3.           | Fermentation tank   | 250 kg/batch | 3.25         |
| 4.           | Pulper cum washer   | 200kg/h      | 2.50         |
| 5.           | Weighing machine    | 100 kg       | 0.50         |
| <b>Total</b> |                     |              | <b>10.75</b> |

### iii. Curry Powder

#### Production Unit

The curry powder production unit is equipped with facilities for powdering and packaging spices or spice blends. The spices brought to the unit are first checked for its moisture content and if the moisture content was found above 10 per cent, the spices are dried in the solar tunnel drier. The rotary drier can also be used for drying spices. The spices are then crushed in the plate crusher or finely powdered in the micro pulverizer as per the material size of the powder required.



Fig. 3. Curry powder production unit

The powdered spices are sieved in the vibro sifter and is filled in pouches and sealed. In case of curry powder production which requires blending of spices, the dried spices are roasted to a definite temperature in the drum roaster before powdering for flavour enhancement and then powdered in the micro pulveriser.

The powder is sieved in the sieve shaker and then transferred to the blender for the homogeneous production of spice mix. The curry powder is then weighed automatically and filled in pouches and sealed. The machineries required for a curry powder production unit and which are installed at ICAR-IISR is listed in Table 3.

Table 3. Machineries in curry powder production unit

| S. No. | Machinery                       | Capacity      | Cost, in lakhs |
|--------|---------------------------------|---------------|----------------|
| 1.     | Solar tunnel drier              | 100 kg/batch  | 5.00           |
| 2.     | Roaster                         | 10-25kg/batch | 1.50           |
| 3.     | Micro- pulverizer (Hammer Mill) | 100 kg/h      | 4.50           |
| 4.     | Sifter                          | 25 kg/batch   | 1.50           |
| 5.     | Ribbon Blender                  | 50 kg/batch   | 1.35           |
| 6.     | Filling machine                 | 200 kg/h      | 4.50           |
| 7.     | Continuous band sealer          | 150 packs/h   | 0.30           |
| 8.     | Weighing machine                | 100 kg        | 0.50           |
|        | <b>Total</b>                    |               | <b>19.15</b>   |

### iv. Cardamom

#### Processing Unit

This is a new facility being installed at ICAR-IISR, Regional Station at Appangala, Kodagu District of Karnataka. The unit has facilities for washing freshly harvested cardamom capsules to remove dust and soil particles. The capsules are then treated with 2% sodium carbonate solution for 10 minutes and spread on perforated sieve of the cardamom drier. The drier consists of a fire chamber in which fire wood is burnt to produce hot air which is passed through pipes into plenum chamber provided at the bottom of the perforated sieve of the drying unit. The heated air in the plenum chamber is blown in to the drying chamber,

loaded with cardamom, with a blower and the cardamom is dried in a fluidized condition.

Cardamom is initially dried at 50°C for the first four hours and the temperature is then reduced to 45°C by opening ventilators and operating exhaust fans till the capsules are properly dried. Finally, the temperature is raised to 60°C for an hour. The process of drying takes about 18-24 hours for reducing the moisture content from 80% to 10%. The dried capsules are rubbed in the stainless steel polisher drum provided with rotating nylon bristles and blades which facilitates the removal of stalk and other flower matter from the produce. The polished cardamom is graded in a rectangular grader provided with stainless steel sieves with perforation of sizes of 7.0, 6.5, 6.0 mm for grading the processed cardamom. The graded produce is stored in polythene lined gunny bags to retain the green colour during storage. The machineries installed at the cardamom processing unit at ICAR-IISR, Regional Station at Appangala are listed in Table 4.

**Table 4 Machineries in the cardamom processing unit**

| S. No.       | Machinery              | Capacity     | Cost, in lakhs |
|--------------|------------------------|--------------|----------------|
| 1.           | Cardamom washer        | 75 kg/batch  | 1.50           |
| 2.           | Cardamom drier         | 150 kg/batch | 2.25           |
| 3.           | Cardamom grader        | 150 kg/h     | 1.40           |
| 4.           | Cardamom polisher      | 150 kg/h     | 1.85           |
| 5.           | Continuous band sealer | 150 packs/h  | 0.30           |
| 6.           | Weighing machine       | 100kg        | 0.50           |
| <b>Total</b> |                        |              | <b>7.80</b>    |

### Successful Incubatees of Spice Processing Unit at ICAR - IISR

During 2015-16, the facility was licensed to four clients for commercial production of spice/curry powders by entering into a memorandum of understanding between with the entrepreneurs.

M/s. SUBICSHA, the Coconut Producer's Company comprising of 532 women forming a self-help group, was the first incubatee to launch their products on January 1, 2016. M/s. Abiruchi Food Products, a unit of Kudumbasree, again, a women self-help group, launched their spice products on February 18, 2016. M/s. Maloos Pure Food mix was launched on June 26, 2016.

M/s Mannil Spices, Kozhikode entered into a Memorandum Of Understanding (MOU) on October 15, 2016 and INNOFARM, an Agricultural Producer Company, from Koodaranhji village, Kozhikode entered in to a MOU on July 10, 2017 and Chakkittapara Service Cooperative Bank Limited signed the MoU on December 11, 2017.

The black pepper cleaning-cum-grading unit is also licensed to two entrepreneurs. M/s Mannil Spices, Kozhikode and M/s. CAMCO, Mangalore entered into MOUs on October 15, 2016 and February 23, 2017 respectively. The firms have already began their commercial production.



Fig. 4 Incubatees operating the pulveriser

Apart from this, some entrepreneurs utilize the facilities of white pepper production and black pepper cleaning cum grading units by paying the rental charges. In addition to hand-holding the entrepreneurs, the facility is also utilized for conducting trainings for potential entrepreneurs, farmers and students regularly.

Products from ICAR-IISR Spice Processing Facility M/s. SUBICSHA, a Coconut Producer Company with 523 women forming a self-help group actively engaged in marketing various food products.

They joined as an incubatee of the Spice Processing Unit of ICAR-IISR during 2015 and started production from December 8, 2015 onwards. They are involved in the production of three spice products – chilli, turmeric and coriander powders. The products launch ceremony of 'SUBICSHA Spice Powders' was



Fig. 5 Sieving unit

organized on January 1, 2016 at ICAR-IISR.

M/s. Abiruchi Food Products, a unit of Kudumbasree, Kozhikode and an incubatee of ICAR-IISR, launched six different spices products, processed at the Spice Processing Facility of ICAR- IISR, Peruvannamuzhi during the launching ceremony organized at Chakkittappara Grama Panchayat Hall on February 16, 2016.

M/s. Maloos Pure Foods, a Kozhikode based new start-up company and an incubatee of ICAR-Indian Institute of Spices Research (ICAR-IISR), Kozhikode entered the fast-growing curry masala market by launching a slew of products under the brand name 'Maloos' on June 26, 2016.

The market launch and first sale was done by Dr. N. K. Krishna Kumar, DDG (HS), ICAR, New Delhi in the presence of Dr. K Nirmal Babu, Director, ICAR-IISR, Kozhikode, Dr. V. K Pandey, Principal Scientist, ICAR, New Delhi, Shri. Pradeep Kumar, Managing Director, Malukart and other staff members of ICAR-IISR. The products marketed by them include spice powders of chilly, coriander, turmeric and black pepper.

#### Production from the Incubation Centre

The commercial production from the incubation centre started during December 2015. Today, from the facility at Peruvannamuzhi, more than 15 tonnes of curry powder and 3 tonnes of cleaned black pepper are processed and produced by various entrepreneurs. The firms have also expressed their satisfaction in utilizing the facility.

It is understood that spices and its derivatives offer great scope under food related agriculture industries. Post-harvest processing of spices has a great scope considering the present international trade scenario.

A huge jump in the export of curry powders and other value added products of spices is expected in the coming decade, which will yield more sustainability for spice based entrepreneurs.

