

2. CARDAMOM PROCESSING

Types of cardamom

There are two main types of cardamom:

- Small green cardamom (*Elettaria cardamomum*)
- Large red/black cardamom (*Amomum subulatum* Roxb)

The most common type is the small green cardamom while large cardamom is mainly grown in India, with some in Nepal and Bhutan. They both come from the Zingiberaceae family of plants.

Harvesting

Harvesting at the correct stage of maturity is essential to produce high quality cardamom capsules. The fruits should only be harvested once they are fully ripe and mature. In some places, farmers harvest the crop before it is fully ripe because they worry that it will be taken by thieves. If the crop is picked when it is mature, the higher yields and higher value of the final product may offset the losses due to theft. A ripe capsule has black seeds inside. An immature capsule has white seeds.



When a cardamom capsule is ripe it can be easily removed from the stem of the plant without too much force. The harvester should start harvesting at the base of each stem and move up the stem, taking off any capsules that easily fall off without pulling. The capsules that do not fall off easily should be left on the plant to ripen.

Cleaning

The crop should be cleaned before processing. The first stage is to remove dust and dirt using a winnowing basket. This can be made locally from bamboo, palm or other leaves. A worker who is used to doing this can clean up to 100kg of cardamom in an eight hour day. Small machines are available for cleaning, but they are often not cost effective.

After winnowing the capsules are washed in clean water. Two or three large plastic buckets (15 litre capacity) are sufficient for small amounts but for large quantities, it may be better to use a sink with a drainage hole. Only water that is safe to drink should be used. It should be changed regularly to prevent contamination.



Pre-treatment

After washing, the stalks are removed from the cardamom capsules by hand. The capsules can be soaked in a solution of sodium bicarbonate (2-5%) for ten minutes to help retain the green colour. This is an optional step. A 2% solution of sodium bicarbonate is prepared by dissolving 20g (about 4 tea spoons) of sodium bicarbonate in 1 litre of water

Drying

This is the most important part of the process as it affects the quality of the final product. It is important to dry the cardamom capsules as soon after harvest as possible to prevent the loss of flavour. It is also important that the drying process is as short as possible so that mould does not grow on the capsules and

the bright green colour is retained. The drying temperature should not be above 50°C as this affects the colour and delicate flavour of the final product. In most places, cardamom capsules with a good green colour can be sold for a premium price. The moisture content of a fresh



cardamom capsule is about 85%. This needs to be reduced to 10% in the dried product so the cardamom capsules can be stored. If the drying period is too long mould can start to grow on the cardamom. There are several options available to the smallscale processor, depending upon the size of the business and the local weather conditions at the time of processing. Each method has different advantages and disadvantages.

- Sun drying.
- Solar drying.
- Wood-fired dryer.
- Electric or gas dryer.
- Humidity-controlled drying.

Grading

Cardamom is graded by colour and size. The deeper the green colour and the larger the capsule size, the higher the grade. All grading is done by hand. The Indian grading system for cardamom capsules separates them into different types:

- Alleppey Green Cardamom
- Coorg Green Cardamom
- Bleached or Half-bleached Cardamom
- Bleached White Cardamom
- Mixed Cardamom



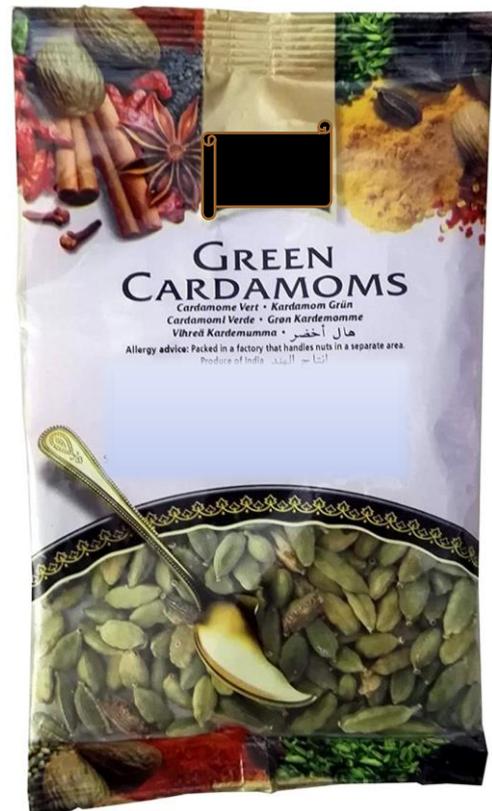
Grinding

Cardamom capsules are usually sold whole. Grinding can be a method of adding value to a product. However, it is not advisable to grind spices. After grinding, spices are more vulnerable to spoilage. The flavour and aroma compounds are not stable and will quickly disappear from ground products. The storage life of ground spices is much less than for the whole spices. It is very difficult for the consumer to judge the quality of a ground spice. It is also very easy for unscrupulous processors to contaminate the ground spice by adding other material. Therefore most consumers, from wholesalers to individual customers, prefer to buy whole spices.



Packaging

Cardamom capsules can be packaged in polythene bags of various sizes according to the market demand. The bags should be sealed to prevent moisture entering. Sealing machines can be used to seal the bags. Attractive labels should be applied to the products. The label needs to contain all relevant product and legal information – the name of the product, brand name (if appropriate), details of the manufacturer (name and address), date of manufacture, expiry date, weight of the contents, added ingredients (if relevant) plus any other information that the country of origin and of import may require (a barcode, producer code and packer code are all extra information that is required in some countries to help trace the product back to its origin). See the Practical Action Technical Brief on labelling for further information on labelling requirements.



Storage

Dried cardamom capsules must be stored in moisture-proof containers away from direct sunlight. For long term bulk storage, polythene-lined gunny bags (strong sacks made from jute fibres) inside wooden boxes are used. The

polythene bags help to preserve the green colour of the pods. It is essential that the capsules are fully dry before they are placed in the gunny bags for storage. Any moisture within the bags will cause the capsules to rot. The stored cardamoms should be inspected regularly for signs of spoilage or moisture. If they have absorbed moisture, they should be re-dried to a moisture content of 10%. The storage room should be clean, dry, cool and free from pests. Mosquito netting should be fitted on the windows to prevent pests and insects from entering the room. Strong smelling foods, detergents and paints should not be stored in the same room as they will spoil the delicate aroma and flavour of the cardamom.



