



CINNAMON PROCESSING

Introduction

Cinnamon is a valuable spice that is obtained from the bark of an evergreen tree (*Cinnamomum zeylanicum*) that belongs to the Laurel family. Cinnamon is native to Sri Lanka, Myanmar (Burma) and the southern coastal strip of India. The crop now grows in South America and the West Indies, the Seychelles and Reunion. The best quality cinnamon is produced in Sri Lanka.

Cassia, which is the bark of the evergreen tree *Cinnamomum cassia*, is a similar spice to cinnamon but of an inferior quality. It is a native of Myanmar (Burma). Most of the world's cassia comes from China, Indochina, Indonesia, the East and West Indies and Central America. Cassia bark is coarser and less fragrant than cinnamon and is sometimes used as a substitute.

Cinnamon gets its distinctive smell and aroma from a volatile oil that is in the bark. The oil can be distilled from off-grade bark, leaves and roots.

Cinnamon must be dried before it is stored and sold for market. This brief outlines the important steps that should be taken pre-harvest and post-harvest to ensure that the dried cinnamon is of top quality for the market.

Cinnamon production

The cinnamon tree is a bushy evergreen tree that is cultivated as low bushes (about 2-3m tall) to make harvesting easier. The bushes grow well in shaded places with an average rainfall and without extremes of temperature. The optimum temperature for production is between 27 and 30°C. The soil should not be waterlogged as this produces a bitter-tasting bark. Eight or ten side branches grow on the bush and these are harvested after about three years to obtain the cinnamon bark.

Harvesting

Cinnamon bark is harvested twice a year immediately after each of the rainy seasons when the humidity makes the bark peel more easily. The trees are first harvested when they are three years old, one year after pruning. The side stems that are about three years old are removed and the bark is stripped off. Cinnamon bark is only obtained from stems that are between 1.2 and 5cm in diameter.



Figure 1: Cinnamon from Sri Lanka. Photo credit: Practical Action / Neil Noble

Processing

Processing accounts for about 60% of the cost of production of cinnamon. This is because the peeling of bark from the stems is labour intensive and is usually done by hand, by skilled peelers. The quality of cinnamon depends on how well the bark is removed from the stems. The larger pieces or quills can be sold for more than the smaller broken pieces. The Agricultural Engineering University of Ruhuna in Sri Lanka has developed a small mechanised machine for removing the bark from cinnamon stems.

Drying is also an important stage of the processing of cinnamon. It contributes to the quality of the final product.

Processing stages

- Remove the tender stems (with diameters less than 1.2cm) and use these for mulching.
- Stems with diameters of more than 5cm are not used to prepare cinnamon bark. Remove these and use for oil distillation.
- Remove the soft outer bark using a fine rounded rasp knife.
- Rub the stripped stem with a brass rod to loosen the inner bark. It is important to use a brass rod so that the bark does not become discoloured.
- Make cuts around the stem at 30cm intervals using a small pointed knife. The knife blade should be stainless steel or brass to prevent staining the bark.
- Make long cuts along the length of the stem, so that the bark can be carefully eased off the stem. Use the pointed knife and the rubbing rod to help ease off the bark.
- The pieces of removed bark are known as quills. Place these curled quills inside one another to make long compound quills (up to 1m long). Use the best whole quills on the outside and fill in the centre with broken pieces of bark.

Drying

The compound quills are placed on coir rope racks and dried in the shade to prevent warping. After four or five days of drying, the quills are rolled on a board to tighten the filling and then placed in subdued sunlight for further drying.

In humid climates or during the rainy season it will be necessary to use a mechanical dryer to complete the drying process. There are a range of dryers available to suit different situations (electrical, gas fired, biomass fuelled). See the Practical Action Technical Brief on drying for further information.

Grading

The quality of cinnamon is judged by the thickness of the bark, the appearance (broken or entire quills) and the aroma and flavour. The Sri Lankan grading system divides the cinnamon quills into four main groups according to diameter:

Classification	Description	Measurements
1. Quills	Alba	Less than 6mm diameter
	Continental	Less than 16mm diameter
	Mexican	Less than 19mm diameter
	Hamburg	Less than 32mm diameter
2. Quillings	Pieces of bark less than 106mm long	
3. Featherings	Inner bark of twigs and twisted shoots	
4. Chips	Trimblings of quills, outer and inner bark that cant be separated	
5. Powder		
6. Leaf oil		
7. Bark oil	Cinnamaldehyde 30-70%	

Grinding

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.

Cinnamon is sometimes ground to a powder prior to sale. The ground powder should be packaged in moisture proof packaging (polypropylene bags) to retain the flavour.

Packaging

Cinnamon quills are cut into pieces up to 10cm in length and packed into moisture-proof polypropylene bags for sale. 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 cinnamon quills must be stored in moisture-proof containers away from direct sunlight. The stored cinnamon quills 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 cinnamon.

Equipment suppliers

This is a selective list of suppliers of equipment and does not imply endorsement by Practical Action.

This website includes lists of companies in India who supply food processing equipment.

http://www.niir.org/directory/tag/z.,1b_0_32/fruit+processing/index.html

Dryers

Acufil Machines

S. F. No. 120/2, Kalapatty Post Office
Coimbatore - 641 035

Tamil Nadu

India

Tel: +91 422 2666108/2669909

Fax: +91 422 2666255

Email: acufilmachines@yahoo.co.in

acufilmachines@hotmail.com

<http://www.indiamart.com/acufilmachines/#products>

Industrias Technologicas Dinamicas SA

Av. Los Platinos 228

URB industrial Infantas

Los Olivios

Lima

Peru

Tel: +51 14 528 9731

Fax: +51 14 528 1579

Bombay Engineering Works

1 Navyug Industrial Estate
185 Tokersey Jivraj Road
Opposite Swan Mill, Sewree (W)
Mumbai 400015
India
Tel: +91 22 24137094/24135959
Fax: +91 22 24135828

bomeng@vsnl.com

<http://www.bombayengg.com/contact.html>

Bry-Air (Asia) Pvt Ltd

21C Sector 18
Gurgaon – 122015
India
Tel: +91 124 4091111
Fax: +91 124 4091100

enquire@pahwa.com

<http://www.bryair.com/index.htm>

Premium Engineers Pvt Ltd

Plot No 2009, Phase IV, GIDC
Vatva, Ahmedabad 382445
India
Tel: +91 79 25830836
Fax: +91 79 25830965

Rank and Company

A-p6/3, Wazirpur Industrial Estate
Delhi – 110 052
India
Tel: +91 11 7456101/ 27456102
Fax: +91 11 7234126/7433905

Rank@poboxes.com

Packaging and labelling machines**Acufil Machines**

India (See above)

Gardners Corporation

158 Golf Links
New Delhi 110003
India
Tel: +91 11 3344287/3363640
Fax: +91 11 3717179

Ashoka Industries

Kirama
Walgammulla
Sri Lanka
+94 71 764725

Kundasala Engineers

Digana Road
Kundasala
Kandy
Sri Lanka
Tel: +94 8 420482

Alvan Blanch

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Wiltshire
SN16 9SG
UK
Tel: +44 1666 577333
Fax: +44 1666 577339
enquiries@alvanblanch.co.uk
www.alvanblanch.co.uk

Mitchell Dryers Ltd

Denton Holme, Carlisle
Cumbria
CA2 5DU
UK
Tel: +44 1228 534433
Fax: +44 1228 633555
webinfo@mitchell-dryers.co.uk
<http://www.mitchell-dryers.co.uk/>

Rank and Company

India (see above)

Banyong Engineering

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Industrial Estate Bangchan
Bankapi
Thailand
Tel: +66 2 5179215-9

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Gurdeep Packaging Machines

Harichand Mill compound
LBS Marg, Vikhroli
Mumbai 400 079
India
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Fax: +91 22 2577 2846

MMM Buxabhoj & Co

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Mumbai
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yusufs@vsnl.com; mmmb@vsnl.com;
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Narangs Corporation

India
P-25 Connaught Place
New Delhi 110 001
India
Tel: +91 11 2336 3547
Fax: +91 11 2374 6705

Orbit Equipments Pvt Ltd

175 - B, Plassy Lane
Bowenpally
Secunderabad - 500011, Andhra Pradesh
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Tel: +91 40 32504222
Fax: +91 40 27742638
<http://www.orbitequipments.com>

Technology and Equipment Development Centre (LIDUTA)

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John Kojo Arthur

University of Science and Technology
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Pharmaco Machines

Unit No. 4, S.No.25 A
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Indian Institute of Spices Research (IISR)

Marikunnu PO, Calicut
Kerala
India 673012
Tel: +91 495 2731346
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parthasarathy@iisr.org; rdinesh@iisr.org
<http://www.iisr.org/package/index.php?spice=Cinnamon&body=Overview>

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<http://www.ircc.iitb.ac.in/webnew/>**Further reading***Drying* - Practical Action Technical Brief*Spice processing* - Practical Action Technical Brief*Labeling food products* - Practical Action Technical Brief

This document was produced by Dr. S Azam Ali for Practical Action March 2007. Dr. S Azam-Ali is a consultant in food processing and nutrition with over 15 years experience of working with small-scale processors in developing countries.

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