



# GINGER PROCESSING

Ginger is obtained from the rhizomes of the plant *Zin giber officinale* Roso. It originated in South East Asia and is valued for the dried ginger spice and preserved crystallised ginger.

Before processing ginger, it is recommended that a market survey is carried out. This will include information on the availability of raw material, availability of processing materials and equipment, access to markets and demand for the different ginger products. This information should indicate whether your business is likely to succeed.

Ginger is usually available in three different forms;

- fresh (green) ginger
- preserved ginger in brine or syrup
- dried ginger spice

## **Fresh ginger**

Fresh is usually only eaten in the area where it is produced although it is possible to transport fresh roots internationally. Both mature and immature rhizomes are consumed as a fresh vegetable.

## **Preserved ginger**

Preserved ginger is only made from the immature rhizomes. Most preserved ginger is exported. Hong Kong, China and Australia are the major producers of preserved ginger and dominate the world market.

Making preserved ginger is not simple, it requires a lot of care and attention to quality, only the youngest, most tender stems of ginger should be used. It is difficult to compete with the well established Chinese and Australian producers. This technical brief will only describe the production of dried ginger.

## **Dried ginger**

Dried ginger spice is produced from the mature rhizome. As the rhizome matures the flavour and aroma become much stronger. Dried ginger is exported, usually in large pieces which are then ground into a spice in the country where it is used. Dried ginger can be ground and used directly as a spice and also for the extraction of ginger oil and ginger oleoresin.

## **Processing ginger**

There are two important factors to consider when selecting ginger rhizomes for processing;

- a. the stage of maturity at harvest
- b native properties of the type grown.

a. Ginger rhizomes may be harvested from about 5 months after planting. At this age, they are immature. They are tender with a mild flavour and are suitable for fresh consumption or for processing into preserved ginger. After 7 months the rhizomes will become less tender and the flavour will be too strong to use them fresh. They are then only useful for drying. Mature rhizomes for drying are harvested between 8 and 9 months of age when they have a high aroma and flavour. If they are harvested later than this, the fibre content will be too high.

b Gingers grown in different parts of the world can differ in their native properties such as taste, flavour, aroma and colour. This affects their suitability for processing. It is most important when preparing dried ginger which needs rhizomes with a strong flavour and aroma. When drying ginger, size is also important. Medium sized rhizomes are the most suitable for drying. The large rhizomes often have a high moisture content which causes problems with drying.

**Making dried ginger**

Dried ginger is available in many forms. The rhizomes may be left whole or they may be split or sliced into smaller pieces to accelerate drying. Sometimes the rhizomes are killed by peeling or boiling them for 10-15 minutes. This results in a black product which can be bleached using lime or a sulphurous acid. The only product which is acceptable for the UK market is cleanly peeled dried ginger.

Dried ginger is produced according to the following steps;

- The fresh rhizome is harvested at between 8 and 9 months of age.
- The roots and leaves are removed and the rhizomes are washed.
- The rhizome is killed. This is done by peeling, rough scraping or chopping the rhizome into slices (either lengthwise or across the rhizome). Whole, unpeeled rhizomes can be killed by boiling in water for about 10 minutes.
- The rhizome pieces are then dried. This is often by sun-drying. Information on drying foods is included in a separate technical brief.

**Quality of dried ginger**

The most important factors to control in the production of dried ginger are;

The appearance of the final product - especially for whole roots for export (not so important if the product is to be ground or used for oil extraction)

Content of volatile oil and fibre - especially for extraction of oils

Level of pungency - especially for the extraction of oils

Aroma and flavour - especially for the extraction of oils

**Quality of the final product is determined by both pre-harvest and post-harvest factors**

- The most important factor is the cultivar of ginger grown. This determines the flavour, aroma, pungency and levels of essential oil and fibre.
- The stage of maturity of the rhizome at harvest determines its end use. At 8-9 months of age rhizomes are most suitable for drying.
- When the rhizomes are harvested they should be handled with care to prevent injury. They should be washed immediately after harvest to obtain a pale colour. The wet rhizomes should not be allowed to lie too long in heaps as they are liable to ferment.
- Care should be taken when removing the outer cork skin. It is essential to remove the skin to reduce the fibre content, but if the peeling is too thick, it may reduce the content of volatile oil which is contained near the surface.
- During drying, the rhizomes lose about 60-70% of their weight and achieve a moisture content of 7-12%. Care should be taken to prevent the growth of mould.
- Dried ginger should be stored in a dry place to prevent the growth of mould. Storage for a long time results in the loss of flavour and pungency.

Processing dried ginger	Quality control
Harvest ginger at 8-9 months of age	Take care to prevent injury and bruising  <8-9 months flavour not developed >8-9 months becomes too fibrous
Remove the roots and leaves.  Wash the rhizomes	Wash immediately to get a pale colour. Do not leave wet rhizomas in heaps for long periods as they will ferment.
Kill the rhizome by one of the methods; <ul style="list-style-type: none"> <li>• peel (knife or peeling machine)</li> <li>• rough scrape (knife or abrasive rollers)</li> <li>• chop into pieces</li> <li>• boil whole rhizome (10 minutes)</li> </ul>	Take care to only remove the fibrous outer cork skin. If peeling is too thick, essential oil and flavour will be lost. Boiling results in a black colour which requires bleaching
Dry to moisture content of 7-12%  Store in a cool dry place.	Dry Rapidly to prevent growth. Do not store for long periods as flavour will be lost

### Ginger oil distillation

Ginger oil is the essential oil obtained by steam distillation of the dried spice. The essential oil possesses the aroma and flavour of the spice but lacks the characteristic pungency. It finds its main application in the flavouring of beverages but it is also used in confectionery and perfumery. Distillation of the oil is mainly carried out in the major market areas of North America and Western Europe using imported dried ginger. However, ginger oil is produced for export in some of the spice growing countries, notably China, India, Indonesia, Australia and Jamaica.

### References and further reading

*Ginger: Sri Lankan Aromatic Plants of Economic Value Booklet No 7*, Nirmala Pieris, Ceylon Institute of Scientific & Industrial Research (CISIR), 1982  
*A note on ginger oil distillation*, ITDG Report, 1979

### Useful addresses

CISIR is now called the Industrial Technology Institute (ITI)

ITI  
363 Baudhaloka Mawatha  
Colombia 7  
Tel: +94 (1)698 624 /697 994  
Fax: +94 (1) 698 624/697  
E-mail: [info@iti.lk](mailto:info@iti.lk)  
Website: <http://www.iti.lk>