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# Canned Raspberries

## Agricultural Processing Brochure

South African farmers facing current economic realities are searching for new options to maintain and expand their businesses. One of the many opportunities to grow markets, turnover and profits is to add value to farm produce. Options need to be selected carefully based on sound information and knowledge of the opportunities presenting themselves.

### Introduction:

#### **Product group: Raspberries**

The raspberry plant, a member of the genus *Rubus*, family Rosaceae, is widely cultivated for its fruit. Together with the blackberry, it comprises the group of plants commonly called brambles. Synonyms include Raspbis, Hindberry, Bramble of Mount Ida, (Danish) Hindebar, (Dutch) Braamboss, and (German) Hindbur. Raspberries are considered as a high value crop. This can be attributed to its unique flavour, high production costs and ease of spoilage.

The crowns and roots of brambles are perennial. The thorny canes, or fruiting portions of the plants, however, are biennial, bearing in their second year and then dying. The berries grow on these 0.5 - 1 m thorny canes or "cane berries".

Raspberries are native to many parts of the world, since they are exceptionally hardy. Varieties include red, purple, and black raspberries. Commercial cultivation has been limited by the plant's vulnerability to virus diseases and by the high costs of manual harvesting. Production of berries of all types is, however, increasing in South Africa. This is largely due to the release of good commercial cultivars that have become accessible to South African growers and the expanding export market.

#### **Product description: Canned Raspberries**

Canned raspberries are prepared from fresh berries and must comply with the specifications as set out in the: Regulations relating to the grading, packing and marking of canned fruit intended for sale in the



“Canned Raspberries are prepared from fresh berries and must comply with the specifications”.



Republic of South Africa. The raspberries may either be packed in water or sugar syrup. The water packed product can be used as pie fillings and toppings. The sugar syrup packed berries can be used as dessert fruit. Red raspberry cultivars are preferred for canning.

### Process description:

#### Harvesting of raspberries

The raspberries are harvested in the firm ripe stage. The raspberries may be picked by hand and placed in flat trays for transport and/or further processing. However, with the improved cultivars that ripen more uniformly and advanced technology of harvesters, mechanical harvesting has become a more viable option for large producers and processors. To obtain maximum quality of the product, it is advisable to harvest these berries during cooler periods of the day, evening, night or early morning.

#### Cooling and cleaning of raspberries

The berries must be cooled to between 0 - 5 °C as soon as possible after harvesting and kept at this temperature range until processing commences.

Hydrocooling is the most effective method to achieve rapid cooling. Water has the advantage of acting as a cooling, cleaning and transportation medium.

The trays of berries are dumped gently into a tank containing cold, potable water (0 - 5°C). The water acts as a cushion against any possible mechanical damage, while cooling and cleaning the berries.

The berries are transported by the water via a trough or closed pipe from the tank to a vibrating, sloping riddle or screen on which it is sprayed with potable water to complete the cooling and cleaning process. From here the clean berries are delivered to the sorting tables/belts via perforated racks/conveyors that also allow draining of cleaning water. The cleaning water may be recirculated after filtration and treatment.

Although forced air-cooling can be used instead of hydrocooling, it requires additional cleaning (aspiration and screening) steps to remove foreign matter. The trays of berries are placed in a chamber where chilled air is drawn into the cold room through the trays. The temperature of the

fruit must decrease to between 2 - 4 °C within 1 hour of harvesting.

Berry fruits are not usually washed, unless they contain significant impurities, in which case washing is performed by passing the fruit on belts under low-pressure water sprayers.

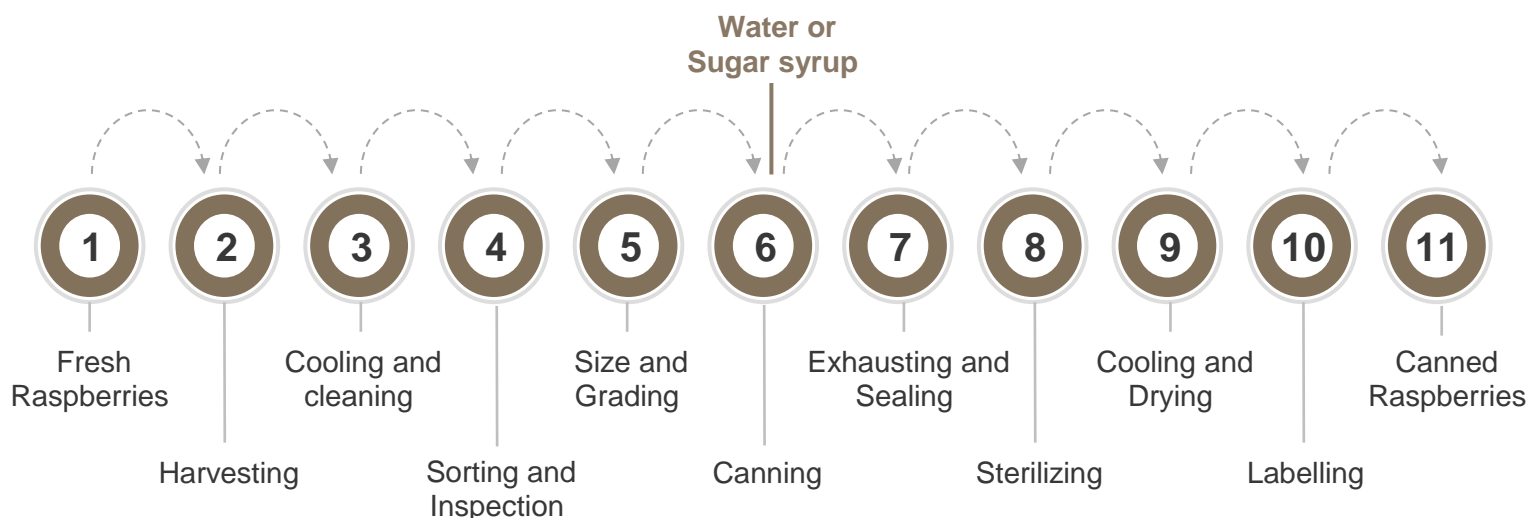
#### Sorting and inspection of raspberries

This is done to select the best suitable raw materials for manufacturing the value-added end product. The clean raspberries are spread out on sorting tables and inspected for defects. Any damaged, spoilt, immature or severely misshaped berries are removed manually. Berries that have not previously been destemmed, are diverted to destemming rollers.

#### Size grading of raspberries for canning

The raspberries are graded according to size using slat riddles. This is important since different size groups have different heat processing requirements. Processing a mixture of different sizes would lead to a non-uniform product, with berries of varying degrees of softness.

## Process overview



## Fast facts

Time and temperature combinations:

# 100°C

The filled containers are exhausted with steam at **100 °C for 5 - 6 minutes** to reach a **centre temperature of 18 °C**.

# 18°C

**TAKE NOTE:** It is strongly recommended that each processor adapts the processing time and temperature to his own unique circumstances as prescribed by a heat processing specialist.

### **Filling and exhausting of cans with raspberries**

Exhausting involves the partial or complete removal of the remaining air or oxygen in the headspace of a can to prevent corrosion of the tinfoil and spoilage of the product. The raspberries are packed into suitable tin cans. Water or heavy sugar syrup (between 50 - 55 °Brix) is added as packaging medium. Water packed raspberries are suited for pies while sugar packed raspberries retain their flavour better and are used for dessert purposes.

Canned raspberries should be clinched prior to exhausting because the berries tend to float. Without clinching the top berries will become soft and break up during processing. The filled containers are exhausted with steam at 100 °C for 5 - 6 minutes to reach a centre temperature of 18 °C.

The steam reduces the oxygen in the headspace, which may cause some undesirable changes in the product (discoloration). The exhausted containers are sealed. Upon cooling, the steam forms a partial vacuum in the headspace

### **Heat sterilization of canned raspberries**

Sterilisation refers to the complete destruction of all micro-organisms in food. Most food products are, however, only commercially sterile. This means that the degree of sterilisation only destroys pathogenic and toxin-forming organisms as well as all other types of organisms which, if present, could grow on the product and produce spoilage under normal handling and storage conditions.

The canned raspberries require a heat sterilisation treatment to stabilise the product. Sterilisation is done in retorts. A great variety of retorts is available, ranging from still and agitated batch retorts to continuous retorts or hydrostatic cookers. The choice of retort influences the time of exposure needed to stabilise the product.

The still retorts are loaded, closed and steam is pumped into the closed vessel. The time/temperature combination depends on the type, the size and dimensions of the container. An approximate time/temperature combination of 10 - 20 minutes at 116 to 121 °C is necessary to reach an internal temperature of 85 °C in the centre of the can. Agitated batch and continuous retorts have more efficient heat transfer mechanisms and thus require much reduced processing times.

### **Cooling and drying of canned raspberries**

The cans must be removed from the batch retort and cooled as soon as the required internal temperature has been reached to prevent over-cooking of the product as this could spoil the texture of

the product. Cold potable water mist spray is used to cool the cans to below 50 °C. Casing and stacking of cans at temperatures above 50 °C may result in quality deterioration known as "stack-burning".

Continuous retorts have a cooling section that automatically cools the cans. The cooled cans are allowed to dry naturally or are dried by fans before being labelled.

### **Labelling of canned fruit products**

Care must be taken to ensure compliance with the regulations with regard to composition and correct description of the contents according to regulations relating to the grading, packing and marking of canned fruit intended for sale in the Republic of South Africa.

## Legislation involving fruit products

Labelling in South Africa is controlled by legislation. Anyone who wants to use the information provided in this document must familiarise him/herself with all the applicable laws that apply to the producing, processing, manufacturing and storage of the products referred to in this document.

### **Other processing options**

Listed below are other processing options not covered in this report:

**Frozen raspberries (IQF):** Raspberries are "individually quick frozen" to produce whole raspberries which maintain their individual identity and are just right for integration into muffins and other bakery products.

**Frozen raspberries** Straight pack: Straight pack raspberries are frozen in the container. This product is used to make fillings, toppings, syrups



and soups. Yoghurt manufacturers can also use it as a fruit flavour.

**Frozen raspberry puree:** Fresh raspberries are crushed and pulped to a puree. Some of the fibrous matter and seeds may be removed, depending on the final use of the puree. The frozen packs are used extensively by commercial pie bakers.

**Raspberry jam** is produced from fresh or frozen raspberries harvested at full maturity. Jam is a product that consists of whole fruit, pieces of fruit, fruit pulp or fruit puree of one or more types of fruit, with fruit juice or concentrated fruit juice as an optional ingredient, and may contain permitted food additives and sweeteners.

**Raspberry jelly** is produced through the concentration and gelling of unsweetened raspberry juice or raspberry syrup. Jelly consists of either the juice or aqueous extracts of one or more types of fruit or of the juice and aqueous extracts of one or more types of fruit which has been clarified by filtration or other means, and may contain permitted food additives and sweeteners.

**Raspberry juice** may be manufactured from fresh or frozen raspberries. A wide range of juice and related products can be manufactured. Both clarified and cloudy raspberry juice can be manufactured. This report will deal with the clarified product.

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For more info visit: <http://www.eskom.co.za/sites/idm/Business/Pages/Alternativefunding.aspx>



# Raspberries

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