



# PASSION FRUIT JUICE SMALL-SCALE MANUFACTURE

Passion fruit is found in many tropical and sub-tropical countries, it is an ovoid shaped fruit that produces juice with a very strong exotic flavour, and a bright orange colour.

The juice has a pH 2.6-3.0 and an unusually high starch content. There are approximately 25-35 fruits to the kilo. The bigger fruits (more than 30g) are more suitable for processing as they have more juice and less rind. There are two important commercial varieties, purple passion fruit (*Passiflora edulis*), and yellow passion fruit, (*Passiflora edulis* forma *flavicarpa*), the latter has larger fruits, a more acidic juice, and a less preferred flavour. The fruits are most suitable for processing when all greenness has disappeared and the outer skin has a smooth or slightly crinkled surface.

The fresh whole fruit can only be stored for a few days at ambient temperature before it deteriorates. At 6.5°C they can be stored for 3-4 weeks before any major deterioration. The pulp can be stored for long periods in bulk with 1000-1500ppm of sulphur dioxide or benzoic acid or a mixture of both, but there is a reduction in the quality of the flavour. During heat preservation the main problem to overcome is the loss of the extremely heat sensitive flavour, which is susceptible to quick oxidation.

The seeds are not suitable for stock feeding due to their very high crude fibre content. However, they are of use in the manufacture of soap, paint, varnish and cooking oils after refining.

The skin of passion fruit is a good source of pectin and makes good manure. It can also be used to make an artificial pears-in-sugar product.

## Recipe

Juice	9%	(to make 400 x 190ml bottles
Sugar	13%	requires approximately 26kg
Water	73%	of passion fruit, and 11kg of
Salt	0.7%	sugar).
Skin pulp	5%	
Sodium benzoate	0.0188%	(188ppm) (preservative)

160ppm of Benzoic acid.

Preservatives are controlled by legal limits, these limits vary from country to country and should be checked at your Bureau of Standards.

## Method

Wash whole fruits in clean water and discard any bad part of the fruit.

Cut fruits in half with a stainless steel knife and scoop out pulp with stainless steel spoon.

Extract the juice from the pulp by liquidising the pulp at a very low speed (this stops the chipping of the seeds, which turn out as black specks in the juice, they are very hard to remove and look like dirt) for about one minute. Tip the contents into a muslin cloth and squeeze out the juice leaving the seeds behind. Liquidise the juice only, at high speed, this reduces the particle size and so helps to reduce settling in the final product. This will give a yield of juice from the whole fruit of between 30-35%.

To make skin pulp take the same quantity of skins, as skin pulp required; boil the skins for approximately 30 minutes, until the flesh of the skin is soft and translucent. Then remove the skins from the water and scoop out the flesh from the outer cuticle. Liquidise this softened flesh with water, (2 parts softened flesh, to 1 part water) to a smooth cream, then squeeze the mixture through a muslin cloth to remove hard pieces of pith. The skin pulp is added to improve the appearance of the juice, to reduce settling it contains pectin and gives the juice more fruit particles.

Dissolve the sugar in the water and filter through a muslin cloth (sugar often contains dirt and foreign bodies). Heat the sugar and water to 90°C and then add the rest of the ingredients to the hot mixture (heating the sugar and water first, means that the fruit juice is heated very quickly up to temperature and so reduces the loss of the sensitive flavour). Heat all the ingredients until the temperature reaches 85°C as quickly as possible.

The fruit juice should be filled into bottles that have been cleaned and then steamed to sterilise them, and are still hot so that the bottles do not crack. The bottles should be filled as quickly as possible so that the juice is not heated for longer than necessary, or recontaminated because it has cooled down before being sealed in the bottle. The lip of the bottle should be clean and dry (wipe with clean tissue paper) before placing the cap on it. Lay the bottles on their side for 15 minutes to cool. Cooling on their side is a most important step to avoid contamination while the cap fits firmly down onto the glass as the vacuum forms.

### **Equipment list**

Bottles, crown corks, and labels  
Crown corking machine  
Cooking facilities, gas ring, electric ring, etc  
Stainless steel saucepan  
Thermometer in protective jacket  
Stainless steel cutting knife and spoon  
Wooden spoon for stirring  
Steam generator  
Cutting board  
Scales  
Measuring cylinder  
Funnel  
Liquidiser  
Muslin cloth

### **Reference and further reading**

*Fruit juice processing* Practical Action Technical Brief  
*Liquid filling and packaging* Practical Action Technical Brief  
*Passion Fruit Jam* Practical Action Technical Brief