

LIME JUICE CLEAR CORDIAL

Production

This describes a manufacturing system capable of producing up to 250 bottles (26oz each) of lime juice cordial per day using simple, comparatively low-cost equipment.

Lime juice cordial is a crystal clear product, normally sweetened with sugar, which is diluted to taste on serving. The product is preserved with sulphur dioxide (SO²) which also protects it against colour changes with time. The essential manufacturing steps involved are as follows:

Wash limes	Crush juice	Rack	Racked juice
Bottle & Cap	Pasteurisation	Mix with sugar & syrup	Clarification
Cool	Label		

The fresh limes should be thoroughly washed in clean water to remove surface dust and other soils.

On a small-scale, simple hand-squeezers are used to extract juice and the yields obtained will be a little lower than those obtained from the heavy stone roller-crushers or screw-presses used in large plants (see below).

The raw juice squeezed from the limes needs to be 'racked' - or allowed to stand thus allowing the crude solid pulp to settle. In order to preserve the juice during this settling time, sodium metabisulphite must be added at the rate of 3g/litre to provide an SO² level of 1000ppm. Racking can be carried out in a large wood or food grade plastic tank with a lid and a drain-valve at the bottom, through which first the sediment and then racked juice can be drawn. Racking time will vary, but three to five weeks is normal. It should be noted that provided SO² levels are maintained, the juice can be stored in racking tanks for some considerable time, thus allowing a production unit to concentrate on juice extraction during the height of the lime season.

Next the racked juice is clarified by the addition of a small quantity; 2.5g/litre; of calcium carbonate (chalk powder) which precipitates the pectin cloud. After the addition of calcium carbonate, the juice should be allowed to stand for 48 hours, to settle. The main problem at this point is to judge the boundary between the clear juice and the sediment. Some suggested systems are shown in Figure 1.

Batch preparation and pasteurisation

The batch is prepared by mixing together clarified lime juice and a previously prepared sugar syrup, the whole being pasteurised by heating to 80°C for 5 minutes. At the end of this stage it will be found that the original sulphur dioxide level will be reduced so as to conform with the generally acceptable legal maximum of 350ppm. The subtle flavour of lime is sensitive to heat and it has been found that the following system, which minimises the heating time, gives a very acceptable product.

A 50°Brix sugar syrup is made by dissolving 6.15kg of granulated white sugar in 10 litres of clean tap water. When fully dissolved, the syrup should be strained through several layers of muslin as even refined sugar contains tiny black specks. The syrup is then raised to boiling point in a convenient pan which can be made from aluminium.

Clarified lime juice and boiling hot syrup are then mixed together in the ratio of 72 parts lime

juice to 100 parts sugar syrup. As the product is acid, ONLY a stainless steel pan should be used. The actual quantities taken will naturally depend upon the size of pan available. The product is then heated to 80°C and a few drops of food grade green colouring are added at this point.

The hot lime cordial should be filled into clean steam sterilised screw cap bottles. The use of good quality lacquered caps is essential due to the high acidity of the product, cheap caps will be found to corrode within a relatively short time. A small capping machine can be manufactured locally.

The hot, capped bottles should be allowed to cool. Forced cooling is preferable to simple air cooling as it reduces flavour changes.

The final product may now be labelled.

Equipment required

Heavy duty scales

Small balance (sensitive to 1g)

Juice racking system

Large pan

Stainless steel pan

Gas ring

Muslin

Stainless or wood stirrer

Thermometer (in protective jacket)

Refractometer (optional but useful if production increases) Green colouring

Calcium carbonate

Sodium metabisulphite

technical brief