

# TECHNICAL GUIDELINES TO ENHANCE SHELF LIFE OF TENDER KING COCONUT FOR THE EXPORT

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King coconut, commonly known as 'thembili' is believed to be indigenous to Sri Lanka. Tender king coconut water is popular in Sri Lanka not only as a thirst aid but medicinal properties as well. It is now gaining international recognition as a natural beverage.

The pleasant taste of nut water is attributed mainly to the sugars and mineral components that are present. Changes in these parameters occur with the stage of maturity and duration after harvesting. The ideal stage for harvesting king coconut for drinking is



at 7-8 months from pollination. At this stage the nut water has the maximum concentration of invert sugars (glucose and fructose), low concentration of sucrose, optimum levels of minerals and vitamins and a neutral pH.

## Nutritive value:

In a 7-8 month-old nut water has a total sugar content of 5-6 g / 100 ml

and of which 95 - 97% are invert sugars.

## Type and content of sugars in tender king coconut water

Sugar type	Amount (g per 100 ml)
Glucose	2.0 - 3.0
Fructose	2.0 - 3.0
Sucrose	0.1 - 0.3

## Mineral components in tender king coconut water

Potassium, the most abundant mineral accounts for more than 50% of the mineral matter in tender king coconut water.

Mineral	Amount (ppm)
Potassium	1900 - 2500
Chloride	1200 - 1600
Calcium	100 - 200
Magnesium	45 - 55

Vitamins (C and B) as well as amino acids (mainly arginine and glutamine) are also present in small quantities in the tender king coconut water.

### **Enhancing shelf-life for sea-freight:**

As our main objective is to cater king coconuts to the export market, the external appearance of the nut before harvesting is of utmost importance. Therefore, it is important to ensure that tender king coconuts are free of insect and mechanical damages before being sent to the market. Furthermore, king coconut palms grown adjacent to the water bodies, produce nuts with a higher volume of water with lower concentration of sugars. Therefore, it is also advisable to test the palatability of nut water before being collected for export.

In order to satisfy export market requirements, the taste of nut water and external appearance of the fresh nut have to be maintained for duration of 3-4 weeks. The Coconut Research Institute, Sri Lanka has developed the following protocol, to improve shelf life of tender king coconuts and keep for a period of 28 days. This protocol is recommended for both growers and exporters.

1. Select 7-8 months old tender king coconuts. If the leaf canopy of a king coconut palm is numbered according to the stage of maturity, and if the flag leaf is considered for counting as number 1, the 7-8 months old bunch is attached to the axis of frond number 14.

2. Pick and transport bunches to the packing site on the same day with extreme care to minimize fresh mechanical damages.

The following process (steps 3 - 10) should be done within 24-36 hours after picking (on the following day).

3. Separate the nuts from bunch as close as possible to the pedicel end

(blunt end) of the nut using a sharp knife disinfected with technical grade alcohol. Bruising or crushing of the stalk should be avoided. Lesser care at this stage may cause early spoilage.

4. Using a piece of cotton cloth, cotton wool or paper tissue, disinfect the remaining part of the stalk including the cut surface and connecting position, perianth area (floral part or 'theriya') and the outer skin of nut with a diluted fungicide solution (0.6g Benlate/ 1L water).

5. Allow the nuts to dry in air for few minutes.

6. Wrap the whole nut with polypropylene cling film (food wrapping film, GLAD WRAP). It is advisable to wrap in such a way that the film adheres well to the skin of the nut. A piece of cellotape may be used to paste the edges of the film. This should be done very carefully to avoid air spaces in between cling film and the nut, which would lead to discoloration and shrinking of the skin.

7. Cover each nut with a net packing



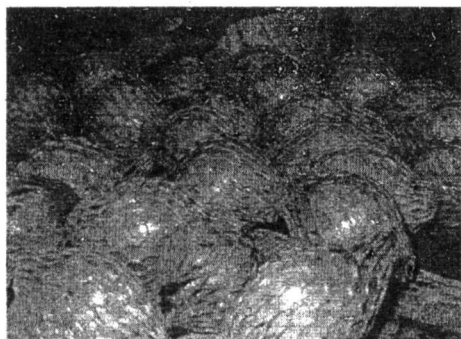
(McBolon (pvt) Ltd, Sri Lanka) to avoid mechanical damages during transport.

8. Pack 6-8 nuts, turning the stalk end (pedicel end) of the nut upwards, in a 7-ply corrugated carton with 6 vents.

9. Immediately after packing, load the packed cartoons to a cold reefer truck maintained at 13-15 °C temperature, for transport.

10. Transfer the cartoons to a cold reefer container maintained at 13-15 °C temperature and 70% RH, for sea freight.

11. The storage conditions as well as temperature and humidity should be maintained all throughout sea freight, transport from seaport to sales points and at the point of sale. After the sea freight, if the nuts are exposed to higher temperatures such as 25-27 °C, the maximum shelf life at that particular temperature is only 4 days. But if the nuts are continuously stored at 13-15 °C the shelf life is 28-30 days from the date of picking.



We would like to advise the exporters to prepare a small sticker to be pasted on the nut with the following details.

- (a) Date of picking.
- (b) Date of expiry.
- (c) Chemical composition of king coconut water.
- (d) Product is free from microorganisms .

(e) Remaining husk is biodegradable

#### Opening of the nut:

Traditional method: Use a sharp knife to cut the husk from stalk end (4-5 cm away from the tip) to slightly expose the shell and cut open a small hole in the exposed portion of the shell. Extract nut water using a straw.

Punching tool: Use the blade to lift the floral part, with the punch turning upwards. Make a punch through the soft region at the blunt end. Rotate the punch while it is inside the nut and pull to make a hole. Extract nut water using a straw.

#### Destroying of the husk:

The remaining part of the used nut, mainly the husk, is a fibrous tissue and biodegradable. This can be cut in to small pieces / chips and used as a potting or gardening mixture to retain moisture.

