

# Technologies for production and preservation of coconut neera

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Coconut sap (Neera) is a sweet juice or sap, obtained by tapping the unopened spadix of the coconut palm. The tapping involves the collection of exuded sap from the inflorescence that yields sweet sap. Tapping methods vary from country to country and even within the country. Neera is obtained from the coconut palm by tapping the unopened spadix. In the tapping, the spathe is beaten and the cells are ruptured in order to stimulate a flow of juice which is called Neera. There is a considerable variation in the yield of Neera from day to day, season to season, spadix to spadix and tree to tree. It is reported that a spadix will yield toddy for 27 to 37 days. In India, the spathe is

considered ready for tapping when the mature one bursts or is just about to burst. The female flower within the unopened spadix causes a swelling at the base and its appearance indicates the appropriate stage for tapping. The yield of sap gradually increases and when it reaches the maximum, the collection is made twice in a day. The flow of the sap from the inflorescence continues for about one month or even more. During this period, the second spathe is also brought into production.

The tapping is usually continued for a period of six months with a possibility of three spathes on the same tree being tapped at the same time. The maximum yield of Neera

is usually obtained in the third month after the commencement of tapping.

Neera is rich in carbohydrates with sucrose as its main constituent and has a specific gravity of 1.058-1.077. Other constituents of Neera are:

- Total solids (g/100 ml) : 15.2-19.7
- Sucrose (g/100 ml) : 12.3 -17.4
- Total ash (g/100 ml) : 0.11-0.41
- Protein (g/100 ml) : 0.23-0.32
- Ascorbic acid (mg/100 ml) : 16-30

Preservation and processing of Neera require a suitable technology, since it is highly susceptible to fermentation. The various technologies available for processing and preservation of neera in different types of consumer packs are given below.

## DRDO Technology

The Defence Research Development Organization (DRDO) has developed a technology for processing and preservation of Neera in its natural form. The technology helps to retain the vitamins, sugar and other nutrients beneficial for health. Heat preservation methods such as pasteurisation and sterilisation are adopted to preserve and extend the shelf life of the product. Temperature requirement for thermal processing of Neera was found to be more than 95°C. Thermal stress could be reduced by the addition of bio-preservative both for in-pack pasteurization and retort processing. Neera is highly photosensitive due to the presence of ascorbic acid,

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hence foil-based multi-layer packaging material such as PET/aluminium foil/cast pp was found suitable to prevent the adverse effect of light. In order to increase the product appeal, the suspended particles in Neera were removed by centrifugation. When the product was processed either by in-pack pasteurization or through retort pouch processing, the shelf life was about three months under refrigerated condition and 30 days under ambient conditions.

### KAU Technology

The technology adopted by KAU for preservation of neera involves the following steps:

The raw neera tapped and collected in plastic cans is brought to the processing site in chilled condition in ice boxes and collected in chilled tanks. The chilled neera is then treated with a preservative and filtered using a centrifuge. The filtered neera is then packed in pet bottles. The packed neera using this technology has a shelf life of about

two weeks under refrigerated conditions.

### CDB Technology

The Coconut Development Board has developed a new technology for collection and processing of coconut neera in hygienic conditions without the application of lime. The technique involves cleaning the spadix initially with a disinfectant and further washing using distilled water. The neera tapped in hygienic condition is collected in HDPE cans with prior application of anti ferment agent. Neera has to be prevented from fermentation during the process of harvesting and transportation. Even slightly fermented Neera cannot be used for processing in any form. Neera has the natural tendency to ferment and this has to be arrested by addition of some preservative or yeast inhibitors. Addition of FSSAI approved yeast inhibitors has been used for this purpose. Sterile handling of inflorescence and vessels are very important in the effectiveness of preservatives. The

process standardized for preservation and packing of neera involves the following steps-

