Processing technology for coconut Neera & Neera products at CIT

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The vascular sap collected from unopened inflorescence of coconut in the fresh form is called Neera. Neera is a delicious health drink and a rich source of sugar, amino acids and vitamins. Coconut sap or Neera is obtained by tapping or cutting the spathe, enclosing the young flower bunches of coconut. The main constituent of the coconut sap juice is sugar (14-18 per cent).

Coconut nectar is widely consumed in countries such as India, Sri Lanka, Africa, Malaysia, Indonesia, Thailand and Myanmar. This sweet sap from Coconut tree is fast becoming a popular drink on account of its high nutritional value, delicious taste and flavour. Neera can be utilized for the production of a range of value added products like sap drink, Sugar, Jaggery, Syrup, Honey etc.

CDB Institute of Technology has developed for the processing technology for neera extraction and processing includes the production and processing of Neera. Technology for packed Neera includes three phases i.e harvesting, processing and packing

Technology

Tapping and harvesting of Neera

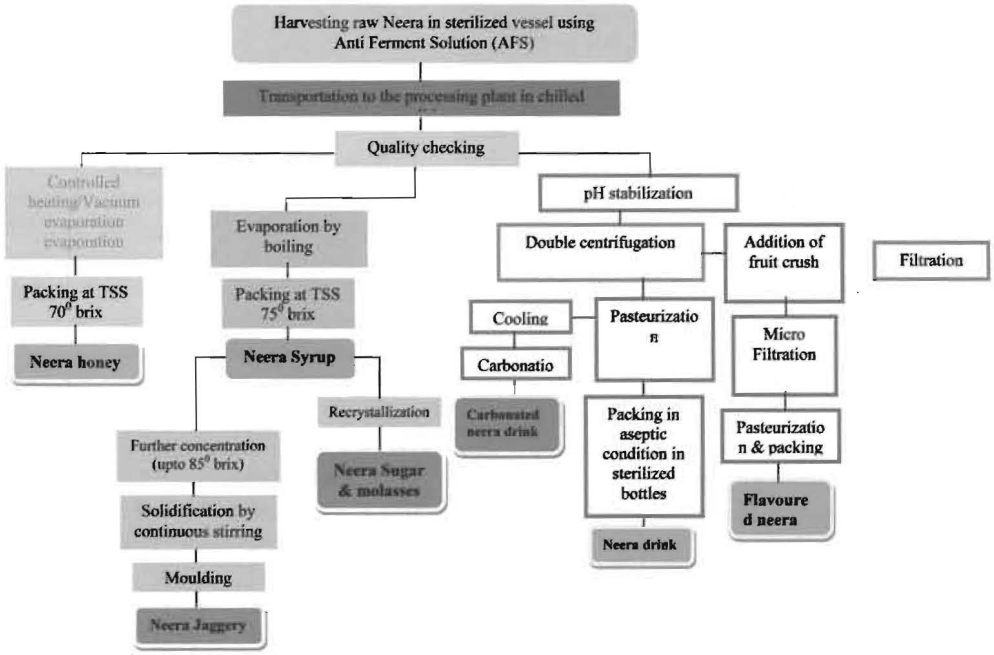
Neera tapping requires adherence to strict procedures right from the collection of the first drop. This is because the sap on extruding comes into contact with air and the process of fermentation is initiated.

Neera tapping is done thrice a day and the sap is collected twice daily using anti-ferment solution (AFS). Chilled condition is required for the storage of Neera. So, Neera is transported to the processing sites in chillers/ iceboxes. On an average a palm yields about 1.5 - 2 litres of neera. To produce good quality Neera, it is necessary that all containers and vessels used should be clean at all times.

Processing

As neera is highly perishable due to natural microflora, it should be processed immediately after harvesting. Consumption of raw neera without processing may cause various food borne illnesses. Raw Neera collected using anti ferment solution (AFS) can be processed in different ways based on the quality of Neera. Apart from pH and brix, organoleptic properties also determine the quality of raw Neera.

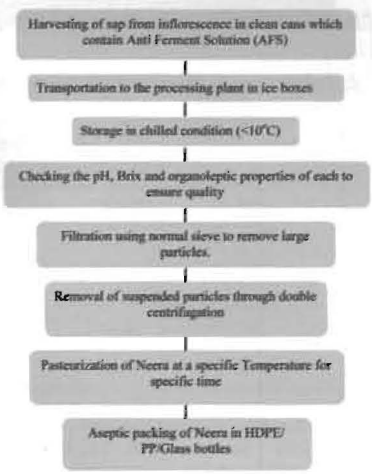
Processing technology of Neera Products



Neera Nutritious Health drink

Neera can be hygienically processed to a natural health drink. Quality of raw neera determines the quality of the processed drink. Raw neera of pH above 5 is always preferred for neera drink. Raw Neera is centrifuged, pasteurized and packed in aseptic conditions to produce Neera drink. Neera drink can also be produced in different flavours (Green apple, litchi, green coconut, lemon etc) for consumer acceptance. Neera is a nutritious drink and is a healthy alternative to aerated beverages and soft drinks available in the market.

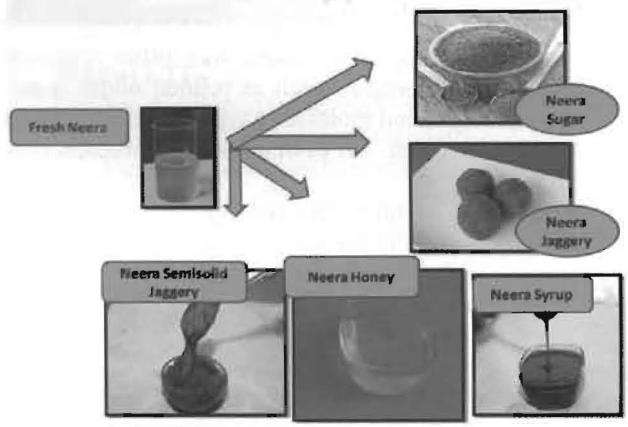
The processing of Neera drink



Physicochemical characteristics of Neera

Sl.No	Parameters	Raw Neera	Packed Neera	Flavoured Neera
1	pH	5.8	5.3	4.3
2	Brix/TSS	15.13%	15.37%	23.1%
3	Total sugar	15.00 %	15.00 %	18.5%
4	Total miner-al matter	0.27 %	0.26 %	0.42%
5	Protein	0.106 %	0.106 %	0.24%
6	Fat	traces	nil	0.03%

Neera primary products



Neera Primary products

Diversified products could be produced from coconut neera by adopting simple technologies which does not require much capital investment. It is possible to promote on-farm utilization of selected products, the processing of which does not require the application of complex technologies. At house hold levels, it could provide employment opportunities to a sizeable population. When the production is organized in a cooperative sector like Farmer Producer Organizations (FPOs), adequate quality control is necessary for the production of good quality products. A high level of hygiene and professional management is necessary to meet the food standards of the confectionery and bakery industry

Primary products of Neera are products which can be prepared directly from Neera by evaporating and concentrating Neera of different pH to different brix levels. Primary products developed by CDB Institute of Technology include Neera sugar, Neera Jaggery, Neera syrup, Neera honey, and Neera semi solid jaggery.

Neera sugar

Neera sugar is the crystallised form of sugar prepared from Neera concentrate. It is prepared by heating and concentrating neera to a syrup consistency and crystallizing it with the help of crystallizing agent. Coconut sap sugar is very delicious, has more nutrients

and does not spike blood sugar like other types of sweeteners. Other sugars such as refined white sugar, muscovado sugar, and molasses have a range of GI from 65 to 100 per serving. GI of other natural sweeteners is as follows:

Date sugar - 100 GI per serving,
Maple Syrup - 69+ GI per serving
Honey - 70+ GI per serving.

Coconut sugar has a low glycemic index(GI – 35) and a low glycemic load(GL – 1). This makes coconut sugar a healthy option for all people but it is particularly beneficial for diabetic patients. Yield of the product is 8-10%.

Neera Jaggery

Neera jaggery is produced by boiling (temperature-103°C -105°C) and concentrating Neera(pH>7) upto a brix level 0f 85° and then solidifying it by continuous stirring and after judgement of end point, moulding it into desirable size and shape. Yield of the product is 12-15%.

Neera semisolid jaggery

Neera jaggery in its semi solid form is Neera semi solid jaggery. It is prepared by concentrating the sap and removing from fire before reaching the strike temperature for jaggery. It is very fine with loose bonding. Yield of the product is 12-15%.

Neera Jaggery syrup

Neera Jaggery Syrup is produced when fresh neera (pH ≥ 6) is heated under moderate temperature (103°C -105°C) and concentrated to syrup consistency (75 - 80° brix). Yield of the product is 18-20%. In many countries, Neera, syrup is used as a health and wellness drink and is prevalently used in Ayurveda and other systems of medicine.

Neera Honey

Neera honey is produced by concentrating neera (pH≤5.5) upto 70° brix level. It is thick liquid syrup like honey. It is used as table syrup as a sweetener in confectionary items like ice creams. Yield of the product is 20-22%. Coconut sap sugar is the crystallized form of sugar prepared from Neera

Nutritional Analysis of Neera Primary Products

Parameter (%)	Sugar	Jaggery	Semi Soild Jaggery	Syrup	Honey
Moisture	1.12	9.10	15.00	-	-
Carbohydrate	95.58	87.54	80.03	65.43	61.50
Protein	0.63	0.72	0.71	0.39	0.12
Total Minerals	2.66	1.97	1.95	2.00	1.75
Crude Fibre	-	0.46	0.43	-	-
Total Soluble Solids	-	-	-	81.44	74.26
Total Fat	Traces	Nil	Nil	Nil	Nil

Physicochemical characteristics of Neera

Sl. No.	Product Name	Carbohydrates (%)	Protein (%)	Fat (%)	Minerals (%)	Fibre (%)
1	Neera Cookies	38.85	6.86	40.90	0.28	2.51
2	Neera Cake	48.00	4.38	15.33	2.11	0.20
3	Neera Spicy Jaggery	85.93	0.79	1.00	3.17	0.61
4	Tutty Fruity in Neera Syrup	67.77	1.76	0.93	4.67	1.54
5	Neera Gulab Jamun	62.26	2.50	1.42	1.44	0.14
6	Neera Coconut balls	29.28	5.20	42.57	2.20	4.46
7	Neera Burfi	52.13	5.51	18.50	1.82	3.24
8	Neera Peanut Ladoo	67.15	10.23	15.33	2.84	0.04
9	Neera Chocolate balls	78.50	3.50	3.92	5.26	0.14
10	Neera Coconut Chocolate	56.14	4.25	34.89	1.34	0.46
11	Neera Fruit Spread	68.10	0.80	0.07	1.48	0.85
12	Neera Lemon Squash	66.10	0.51	0.01	2.07	-
13	Neera Pineapple Squash	63.20	2.03	0.01	1.05	-

concentrate. Coconut sap sugar is very delicious, has more nutrients and does not spike the blood sugar like other types of sweeteners so it is particularly beneficial for diabetic patients. Neera Jaggery is a rich source of minerals like iron and calcium and has medicinal properties. Neera syrup is prevalently used in Ayurveda and other systems of medicine. Neera honey is used as table syrup as a sweetener in confectionary items like ice creams and is also a rich source of iron.

Value addition

Neera has a high potential for value addition due to its health benefits. Sweets and confectionaries prepared from normal sugar and jaggery can be prepared by substituting with neera sugar/jaggery/syrup/honey.

Low GI foods find applications in the proper control of Diabetes Mellitus and Cholesterol levels. The GI of coconut palm sugar is 35 while that of cane sugar is 70. Value addition of neera primary products can yield a variety of products in the category of snacks, sweets, Chocolates, candies, confectionaries, jam, squash, desserts & frozen delights.

Some of the products which can be produced from neera include neera spicy jaggery, neera cookies, neera chocolate, neera cake, neera peanut ladoo, Neera shake, neera pudding, neera fruit spread, neera squash, neera icecream, neera chunks, neera instant black coffee mix, etc.

Role of CIT

CIT has developed the technology for preservation and processing of Neera and standardized various value added products from Neera. CIT offers various services to the Farmer Producer Organizations (FPOs) viz. technology for preservation and packing of Neera, fourteen days training programme for traditional toddy tappers to equip them as Neera master technicians, six days training on Production of Value added products from Neera, consultancy services for setting up of Neera plant and quality testing services for Neera and Neera products. ■