

# Health benefits of Neera and potential for value addition

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Coconut sap or Neera is obtained by tapping or cutting the spathe of coconut. The main constituent of the coconut sap juice is sugar (14-18 per cent). The physical and chemical composition of freshly collected coconut blossom "sap" or "nectar" indicates that it is naturally rich in Potassium, Magnesium, Zinc and Iron and is a natural source of twelve (12) of the essential vitamin B complex and vitamin C and has a neutral pH.

## Neera and Neera products, a healthy option in our diet?

Neera is diabetic friendly due to low Glycemic Load/Glycemic Index. Neera is rich in minerals and vitamins and it contains glutamic acid necessary for protein synthesis. It aids in digestive health. Neera contains vitamins (Vit.A & Vit.C) which have anti-oxidant properties thereby preventing damage or death of cells.

Neera can be promoted as a health drink, as an instant energy provider, as a functional food and a nutraceutical. It is good for post-operative care due to the high content of electrolytes.

## Glycemic Index and Glycemic Load

The Glycemic Index (GI) is a measure of how quickly and how high a particular carbohydrate raises blood sugar levels by releasing glucose into the bloodstream. GI is a numerical ranking system (0 to 100) that compares a given food to pure glucose (GI - 100).

Low GI is measured at 55 or less, medium GI at 56 to 69 and high GI at 70 or more. Low glycemic foods contain unrefined, complex carbohydrates that break down into glucose more slowly and allow for a slower release of usable energy. Therefore it is better for controlling blood sugar levels in the body.

Glycemic Index should be taken into account when we decide the quality of carbohydrate in a food item. A glycemic index value therefore tells us how rapidly a particular carbohydrate turns into sugar. It doesn't tell how much of that carbohydrate is in a serving of a particular food. Both the things are important to understand a food's effect on blood sugar.

Glycemic Load considers the quality and the quantity of carbohydrate content of the foods. Therefore, you can reduce the glycemic load of your diet by limiting foods that have both high glycemic index and high carbohydrate content. The Glycemic load has been widely used to help diabetic patients manage their carbohydrate consumption as well as those managing their body weight.

The glycemic index value alone does not give accurate picture of the food. The glycemic load (GL) takes both quality and the quantity of carbohydrate content of the foods into account. The glycemic load is the glycemic index divided by 100 multiplied by its available carbohydrate content. The glycemic load of coconut palm sugar is 1.4, or 1 when rounded off.

Research carried out by the Food and Nutrition Research Institute (FNRI) study in 2007) revealed that coconut sugar has a naturally lower Glycemic index rating (GI) of 35 compared to that of most available commercial

sugars such as table sugar's GI index of 70, Honey's GI of 55 and Cane Sugar's GI of 68.

Low glycemic index of coconut sap sugar is mainly due to the presence of Inulin, a natural source of carbohydrate present in more than 36,000 species of plants including coconut, asparagus, wheat, onion, garlic, chicory etc

### Benefits of taking low GI foods

By helping to maintain lower blood sugar and insulin levels, a low-GI diet may be useful in preventing and treating a variety of health problems. Here are some examples of how eating low on the glycemic index can help promote excellent health:

**Diabetes** - Substituting low-GI carbohydrates (like thick-cut oats, pasta, and legumes) for high-GI carbohydrates (like processed cereals,

white bread, and potatoes) can help lower blood glucose levels in people with diabetes. This is why the GI has been an integral part of medical nutrition therapy for diabetes in Australia, New Zealand, Canada and Europe for many years.

Harvard University researchers who tracked the eating habits of over 100,000 men and women found that people whose diets are low in fiber and high in refined and high-GI carbohydrates are more than twice as likely to develop type 2 diabetes, as are people who eat a diet with a low glycemic load.

**Cancer** - Insulin is a cellular growth factor. Many studies have shown an association between high insulin levels and a variety of cancers including breast, colorectal, prostate, and pancreas. Other studies have shown links between diets high in sugar, refined carbohydrates, glycemic

load and cancer. This suggests that lifestyle changes like maintaining a healthy body weight, exercising and eating a healthy low-GI diet may help protect against cancer at least partly by lowering insulin levels.

**Cardiovascular disease** - As with type 2 diabetes, researches have found that a diet rich in refined and high-GI carbohydrates may substantially raise the risk for heart disease. These foods increase blood insulin levels, which in turn contribute to a higher blood pressure, higher levels of blood fats (triglycerides), lower levels of HDL (good) cholesterol and an increased tendency for dangerous clots to form and linger in the blood.

**Hypoglycemia** - People who have meal-related reactive hypoglycemia secrete too much insulin after eating. This causes the

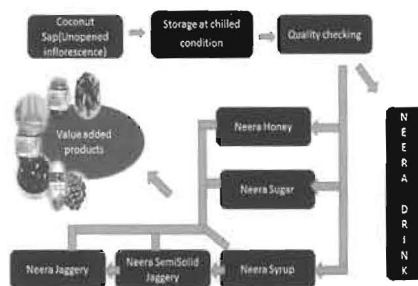
Nutrient	Value	Health benefits provided by these Nutrients
<b>Carbohydrates(g/100g)</b>	15	Main source of energy in our body
<b>Proteins(g/100g)</b>	0.06	Building material of the body, major role in maintenance and repair of the body
<b>Important Vitamins</b>		
<b>Vitamin C (Ascorbic acid) mg/100 ml</b>	16-30	<b>Antioxidant</b> -prevent cancer, Increases absorption of iron, healing effect
<b>Vitamin B1(Thiamine) mg/dl</b>	77	Necessary for the release of energy from fuel molecules.
<b>Vitamin.B8(Inositol) (mg/dl)</b>	127.7	Helps reduce high cholesterol, good for heart. Formation of healthy cells in the body
<b>Important amino acids</b>		
<b>Glutamic acid g/100g</b>	34.2	Major role in synthesis of proteins. Useful in support healing of illness and injury as well as reduce healing time after operations.
<b>Important Minerals -Macro nutrients(mg/100g)</b>		
<b>Pottassium</b>	168.4	Reduces hypertension, helps reduce blood sugar, helps control cholesterol levels and weight.
<b>Magnesium</b>	2.9	Essential for metabolism, nerves and stimulates the brain(memory)
<b>Nitrogen</b>		Help treat cardiovascular diseases
<b>Phosphorous</b>	3.9	Important for bone growth, kidney function and cell growth
<b>Sodium</b>	90.6	Plays a key role in the functioning of nerves and muscles
<b>Chlorine</b>	47	Maintain body fluid volume, acid-base balance
<b>Important Minerals -Micro nutrients(mg/100g)</b>		
<b>Zinc</b>	0.020	Called the "nutrient of intelligence" is necessary for mental development
<b>Iron</b>	0.053	Vital for the quality of blood, mental development and the immune system
<b>Copper</b>	0.031	Helps to release energy, helps in melanin production in the skin, helps in the production of red blood cells and aid in the absorption and transport of iron

cells to remove so much sugar from the blood that they feel weak, irritable, giddiness and hungry.

**Obesity** - Since low-GI foods are slowly digested, they provide a gradual and sustained rise in blood sugar. This keeps feeling full and satisfied and delays the return of hunger between meals. Conversely, high-GI carbohydrates provide short bursts of energy that satisfy you in the short term but soon leave you hungry.

**Potential Value added products from Neera**

Diverse products can be prepared from coconut sap. It is possible to promote on-farm utilization of selected products, the processing of which does not require the



application of complex technologies.

A high level of hygiene and professional management is necessary to meet the food standards of the confectionery and bakery industry.

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 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.

**(A) Neera, Drink**

Neera can be hygienically processed to a natural health drink. Quality of raw neera determines the quality of drink processed. So, 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



NEERA DRINK

acceptance. Neera could become a nutritious drink offering a healthy alternative to aerated beverages and soft drinks available in the market.

**(B) Primary Products of Neera**

Neera can be concentrated to different brix (value of total solids) level at different temperatures to produce primary products like Neera sugar, Neera jaggery, Neera semi solid jaggery, jaggery syrup, Neera honey and Neera concentrate.



**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 your 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 perserving.

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 of 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 jiggery**

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 e" 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 (pHd"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%.

**Sweets and Confectionaries from Neera**

Neera has 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.



Some of the products which can be produced from Neera include neera spicy jaggery, neera cookies, neera chocolate, neera cake, neera fruit spread, neera squash, neera icecream etc.

Diversified products could be produced from coconut neera by adopting simple technologies requiring not much capital investment. 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 Organisations (FPOs), adequate quality control is necessary for the production of good quality products.

**Parliamentary Standing Committee conducted study visit**

The Parliamentary Standing committee on Personal, Public Grievances, Law and Justice headed by Dr.E M Sudarsana Natchippan visited Madurai,Rameswaram, Chennai, Bangalore and Kochi from 27<sup>th</sup> January to 4<sup>th</sup> February 2015 and held discussions with the representatives of Public Sector Enterprises, state governments and other stakeholders. Coconut Development Board made a presentation on the status of implementation of Citizen's charter, public grievance redressal mechanism, RTI act and government's policy of reservation in central government organizations.



Members of Parliamentary Committee tasting Neera. Shri. T K Jose IAS Chairman, CDB is seen