

*Short Communication*

## **Manufacture of carbonated tender coconut water and development of a process for the utilization of coconut flesh**

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### **Abstract**

According to previous research, tender coconut water (*Cocos nucifera*) is one of the highest sources of electrolytes known to man. It contains sugar, vitamins, minerals, potassium, magnesium, fibre, proteins and antioxidants. Coconut flesh is sweet and contains less sugar, more protein than many popular fruit. It has less fat, and these have a high proportion of saturated fat, and it is relatively high in minerals such as iron, phosphorus and zinc.

Both tender coconut water and coconut flesh are used as food and medicine. Recently, modern medicinal research has confirmed many health benefits traditionally attributed to this remarkable tender coconut water and flesh. In this research the coconut was studied as a source of nutrients, as well as how to retain these nutrients during processing for the preparation of a carbonated beverage & coconut jam.

Carbonated tender coconut water and coconut jam provide a range of nutrients which are necessary for human health. A series of chemical, nutrient and sensory tests for beverage and jam were conducted. The developed carbonated tender coconut water had many beneficial effects because it had added lime juice and vitamin C (ascorbic acid). According to analysis of the results, the two products are nutritionally rich.

**Keywords:** *Cocos nucifera*, beverage, analysis, Sri Lanka

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## **Introduction**

Coconut (*Cocos nucifera*) is one of the oldest known tropical crops and is referred as the “Tree of Life”. Every part of the coconut palm is used for many purposes for many millions of people in the world. It is a primary source of food, water, drink, purifier, fluid re-hydration, isotonic, energy, tonic, fuel, soil rejuvenator from the fibre, animal feed and shelter.

Structurally, the cavity of coconut kernel contains the liquid endosperm (coconut water) which varies in volume and nutrients depending on the maturity of the nuts. Tender coconut water is a natural product having sugar and other nutrients such as amino acid, vitamins, low fat and minerals like phosphorous, sulphur, sodium, iron, potassium and calcium and they are in proportions according to the age of the coconut.

The flesh in a young coconut is thick albuminous endosperm, it is white in colour and edible, softer and more like gelatin than a mature coconut and it is sometimes known as coconut jelly. It is sweet and contains less sugar, more protein than many popular fruit, less fat (having a high amount of saturated fat) and is relatively high in minerals such as iron, phosphorus and zinc.

As a tropical plant, tender coconut water has many medicinal values compared to its flesh. Some of them are effective in the treatment of kidney and urethral stones, they do not produce heat and do not destroy red blood cells. Being readily accepted by the body, it is excellent for oral re-hydration and as an all natural isotonic for all ages, maintaining the human body's natural fluid levels to help maintain proper blood pressure, circulation and kidney and liver functions.

Because of the high nutritional and herbal values of coconut, this study was conducted to develop consumer acceptable carbonated tender coconut water and coconut jam using tender coconut, lime and water melon.

## **Materials and Methods**

### **Preparation of carbonated tender coconut water**

When preparing a syrup for beverage, tender coconuts were cut and the water collected. The brix value and pH were then tested. Lime juice, ascorbic acid, preservatives and refined sugar were then added. The brix value was then adjusted and the prepared syrup filtered and measured.

Carbonated water was mixed with prepared syrup and then chilled. The prepared carbonated drinks were then filled into clean sterile bottles and crowned. The filled bottles were finally pasteurized and labeled.

### **Preparation of coconut jam**

Tender coconuts were cut the flesh removed and collected. Watermelon was cleaned and the peels and seeds removed. Coconut flesh and watermelon were cut separately into pieces and then pulped using a blender. The weighed quantity of pulp was put into a stainless steel pan and the required quantity of sugar and pectin were added. Sugar and pectin were weighed into equal

parts. The pectin was mixed with one part of sugar and then water, equal to 1/3 of the weight of the sugar was added. Then the remaining sugar was added to the pan, mixed well and boiled. The mixture of pectin, sugar and water were added to the boiling pulp and heated until the desired texture, colour and taste were achieved. The brix value and temperature were then checked. The mixture was removed from heat and mixed with sodium benzoate and citric acid dissolved in equal amounts of water. The pH of the jam was then checked by mixing one part of jam with one part of water. Finally, the jam was filled in to a clean, dry container leaving a 1/2" head space. The bottles were capped and were allowed to air cool before being labeled.

Proximate analysis was carried out for the products for moisture (AOAC 1984), total fat (Pearson's 1985), crude protein (Pearson's 1985), total ash (Pearson's 1985), vitamin C (Pearson's 1985), reducing and total sugar (Pearson's 1985) and total microbial count (Pearson's 1985). Sensory evaluation (Hedonic test) was used in the testing of newly manufactured products against similar available products.

### **Results and Discussion**

Proximate analysis revealed that carbonated tender coconut water contained 0.0118% protein, 21.05% reducing sugar, 46.79% total sugar, no fat and 0.0525% vitamin C. Coconut jam contained 0.9681% protein, 26.84% reducing sugar, 58.25% total sugar, 11.1% total fat and 0.525% vitamin C. In manufacturing process of carbonated tender coconut water, beneficial effects were increased by adding lime juice and vitamin C. In coconut jam, beneficial effects were increased by adding water melon. Vitamin C in these products acts as an antioxidant and protects the colour of the beverage.

### **Conclusion**

Both tender coconut water and coconut flesh are used as food and medicine. In this project, the development of carbonated tender coconut water and coconut jam was selected because of their nutritional value, raw material availability and no products currently in the market.

The prepared beverage 200 ml container contains 105 mg vitamin C, 23 mg protein and is fat free. Prepared jam 400 g container contains 2100 mg vitamin C, 38 mg protein and 444 mg fat. In sensory evaluation all tested parameters are in consumer acceptable level and tested shelf life for carbonated tender coconut water and coconut jam was seven months.

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