Value Added Products From Tender Coconut

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Introduction

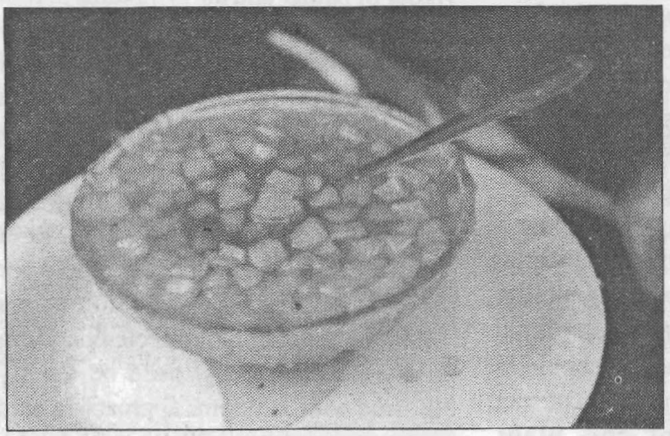
India is the largest producer of coconut with a production of 14925 million nuts annually. About 90% of the production comes from the southern states, out of which the contribution of Kerala is 45% followed by Tamil Nadu with 28% and Karnataka with 11%. (Kretschmer and Bose 1999). Decline in price of coconut is a major constraint faced by the coconut farmers. In this context, the value addition and product diversification to increase the profitability and sustainability of coconut cultivation have been well recognized. At present, the post harvest processing is confined mainly to the production of edible and milling copra and coconut oil (Poduval *et al* 1998). There has not been much progress in the development of products when compared to other countries like Philippines, Indonesia and Thailand.

Efforts on product development are not in commensurate with the availability of the coconuts. Low cost food processing technology can offer excellent opportunities for rural folks in the production of processed foods in the rural sector. Therefore, the need of the hour for India is to accomplish product diversification either by technology transfer or by developing indigenous technology so that various processed coconut based products can tap both the export and domestic markets. It can also extend the use of coconut products to areas where they are scarcely used.

Tender Coconut Water

The tender coconut water is a sweet, delicious and refreshing natural drink. It is the most sterile of all the naturally occurring drinks and is also a rich source of life saving electrolytes. Tender coconut has number of medicinal properties and it is an essential component in many ayurvedic preparations.

Studies revealed that the coconut fruit at seven to eight months' maturity contain about 300 ml water, with 20 g sugar and 2 g of potassium (Thampan 1996). The water from young tender coconut has high amounts of potassium, sodium and chlorine. The pH of tender nut water varies between 4.8 and 5.3, and it has high amount of ascorbic acid (vitamin C) and other vitamins of B group. Chowghat Orange Dwarf was released by CPCRI as the most suitable variety fo tender nut purpose. (Ratnambal 1999).



Tendernut in syrup - faluda

At the all India level, the consumption of coconut as tendernut is less than 10% of the total coconut production. Eventhough more than 25% of coconut production is consumed as tendernut in States like Karnataka, Andhra Pradesh and West Bengal, tendernut consumption is negligible in Kerala. Effort was made to develop products from tender nut water and tender kernel. Popularisation of tender coconut water as a beverage is one of the options to overcome the present crisis in coconut industry.

Tender Coconut Water-Pine Apple Beverages

Tender coconuts are transported and sold in their natural form, involving a lot of transportation cost due to the volume of the materials. Coconut water can be marketed as a natural soft drink if preserved and packed. Research on value addition of coconut water resulted in the development of coconut water-pineapple blended beverages. The optimum age of the tender coconuts for processing was found to be around seven months when the tender coconut water attains its optimum quality with respect to flavour, taste and yield.

Blending of fruit juices has been found to be beneficial in the development of new products. Pineapple is available in plenty in Kerala, and its flavour is acceptable to the consumer. Pineapple is a rich source of vitamin C, thiamin and sugars,

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whereas tender coconut is rich in potassium, sodium and B-vitamins. Tender coconut water and pineapple juice are separately collected, filtered and pasteurised. The two preparations are then blended and acidulants are added. Carbonization of the product enhances the taste and shelf life.

Process

Fully ripe, sound pineapples were selected. After removing the crown and stem portions, the fruits were washed in tap water. The rind was peeled either with knives or with punches. The prepared slices were crushed in mince and thus 300-350ml of juice can be extracted from 1 kg of pineapple. The juice was pasteurised at 90^0C for 30 seconds. On an average, from one tender coconut around 300ml of tender coconut water is available. The tender coconut water and pineapple were blended in the ratio of 50:50, 70:30 and 80:20 respectively.

Organoleptic evaluation was done with the help of Score card and Hedonic scale. The product is well acceptable with pleasantly mild coconut flavour and smooth homogenous texture that remain good and organoleptically unchanged for one month under ambient condition and about four months under refrigerated condition when stored in glass bottles. The cost of production is about Rs. 3.50 per 200 ml bottle of blended beverage. The study indicated that 25-33% pineapple juice could be incorporated in tender coconut water without affecting the quality and acceptability of the coconut water beverages.

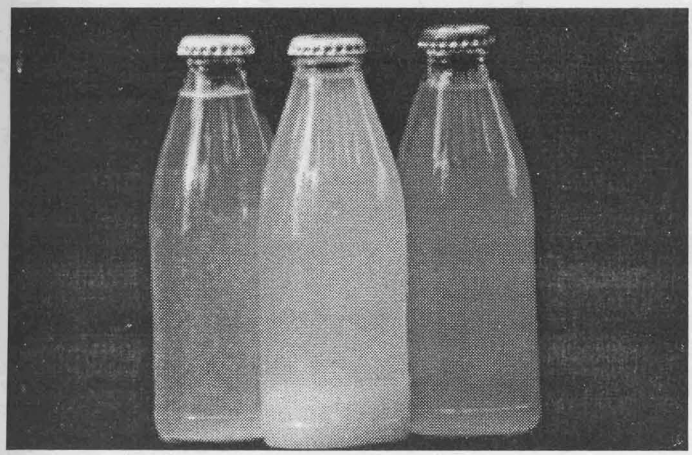
Preserves from Tender Coconut Kernel

The kernel of tender coconut, on the other hand, could be eaten fresh or straight from a newly split nut. From one nut about 250 gms of kernel can be obtained. It is a good source of carbohydrate, fiber and other nutrients. Protein content was high in the eight-month-old fresh coconut meat. Protein fortified foods is of current interest because of the nutritional awareness of the consumers. Unlike other plant proteins, the coconut protein is high in sulphur containing amino acid, which is considered as important criteria for food protein.

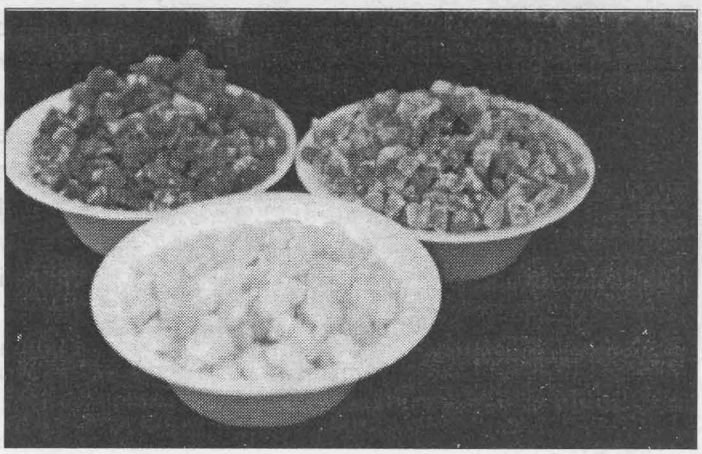
The fresh kernels left after the use of tender nut water is not put to effective use though it has high nutritional qualities. Efforts on value addition and product diversification has resulted in the development of new products such as *tuity-fruity, petha* and *candy* from fresh tender nut kernels.

Processed young tender coconut kernel could be in the form of sweetened dehydrated or dried '*buko*' or young tender coconut kernel in syrup or dried buko chips. These young coconut kernel products are ideal for dessert or snackfood. It can also be used as a filling for the pies. Freshly made preserves are wholesome and attractive. The fruits mixed with cane sugar and subsequently drained and dried are called a candied fruits. Candied fruit covered with a thin transparent coating of sugar is called a glazed fruit. When candied fruit is coated with sugar or sugar crystals are allowed to deposit on it, it is called crystallized fruit. (CFTRI 1999).

A low cost technology was developed for production of preserves from tender coconut kernel. Eight-month-old coconut is used to make candy preserve. Glazed preserves like tuity-fruity made from tender coconut kernel can be incorporated in bakery products like cakes, cookies, etc. Crystallised candy made with tender coconut kernel can be consumed as a snack. Tender coconut kernel in sugar syrup can be used as a dessert or incorporated with ice cream, custard or pudding.



Tender coconut water - pineapple beverages



Tuity-fruity

Process

Young coconut is washed and split opened to remove the water. The soft kernel is scooped out and cut into cubes. Pricking should be done with stainless steel forks. In the case of crystallised candy like *petha*, after pricking, immerse the fruit pieces in dilute limewater (1.5%) or alum (2%) for some time before further processing. Wash the pieces, 3-4 times with fresh water.

Blanch the fruits for 5 minutes in boiling water to make them soft that assists in absorption of sugar and to prevent enzymatic browning. Take 50% of the sugar and spread it on the blanched fruit pieces in alternative layers. Allow standing for 24 hours. Next day drain off the syrup, add enough sugar to raise the thickness of syrup to about 60^0 Brix. Add citric acid as preservative. Add the coconut pieces, boil and keep for 24 hours. Repeat the process every day till the Brix of residual syrup reaches $70\text{-}75^0$. Drain off the syrup. Dry in sun or hot air drier. Store in bottle or polythene bags.

In the case of crystallised candy the concentrates of sugar syrup is continued till it attains a Brix value of $75\text{-}78^0$. Drain off the syrup and roll the pieces in finely ground sugar. Store it in clean dry glass or glazed container or polythene covers. The cost of production per 100 gm pack comes to about Rs. 4. Crystalised candy can be stored for 3 months, *Tuity fruity* for 15 days and tender kernel in syrup for 2 months. The products had good consumer acceptance. Organoleptic evaluation was done for appearance, taste, colour, texture, donesess and overall acceptability with the help of Score card and Hedonic scale. *Tuity-Fruity* was preferred more than *Petha* and tender kernal in syrup.

Conclusion

Products have been developed both from tendernut water as well as tender kernel, which are nutritionally superior and acceptable in organoleptic evaluation. The tender coconut water pineapple beverage developed has better nutritional qualities and acceptability than the tender coconut water and can form an ideal health drink. The production of confectionery items such as tuity-fruity, candy and petha will go a long way for effective utilisation of tender nut kernel, which is often left unutilised. Thus, tender coconut fraction can serve as a valuable ingredient for many products. Considering its functional properties, its application need to be exploited in India as well as in global market by producing more new products.

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Coconut Oil Compulsory in Diesel Fuel

In an effort to increase domestic consumption of coconut oil and boost farmers' incomes, the Philippine government announced in August that it would introduce a bill requiring the mandatory use of coconut oil derivatives in diesel fuels.

The compulsory blending of at least 5% of coconut derived diesel with petrochemical diesel in fuels used by all public utility vehicles and stationery engines is proposed. The measure would increase local coconut oil consumption by an estimated 500,000 tonnes. All vehicles operated by the Philippine Coconut Authority and the country's department of agriculture have been using such a blend since May.

Earlier this year, oversupply in the international vegetable oils market combined with a glut of local copra saw copra prices in the Philippines as low as 2 pesos/kg, but they have since recovered to 8-10 pesos/kg.

In the past, lauric oils and their raw materials have seen dramatic swings in prices when production and consumption have become out of line.

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