Coconut Food Products

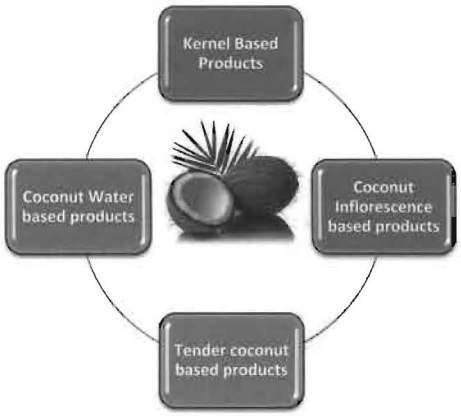
● **Aneeta Joy,** Food Technologist, **R Jagadheesh Priya**, Food Processing Engineer, CIT.

Coconut tree is acclaimed as the tree of life because of its range of environmentally sustainable uses. It is widely used for household as well as industrial purposes. As each and every part of the tree is useful, the potential of this tree cannot be neglected. It can be considered as a consistent food supplier. It has become an unavoidable item in the dining table of an ordinary Indian.

Being a wholesome and nutritious food item, coconut has attracted the diet of many people worldwide. There is a broad spectrum of different food items that can be prepared from coconut. These varieties of Coconut food products offer a vast scope of further development, value addition and commercialization.

Even though various technologies are being developed, there is a need for commercialization of these products in order to provide an additional source of income and to improve the economic status of farmers and the country.

Varied food items can be prepared from coconut. Kernel, water and the inflorescence makes the major source of food items from coconut.



Coconut Kernel - a consistent food source

Coconut kernel is the most important food source from coconut palm. It is rich in energy, vitamins, protein, minerals and fibre. Fibre rich coconut kernel is good for the health of digestive system and easy bowel movements. Some of the products which can be prepared from coconut kernel includes:

Coconut oil

Coconut oil is extracted from the kernel of matured coconuts harvested from the coconut palm. It is generally obtained by mechanical extraction methods. It has been found that certain fatty acids like lauric acid and their derivatives of coconut oil can have detrimental effects on inactivating various microorganisms such as bacteria, yeast, fungi and enveloped viruses and thereby found to be good for immune system.

Desiccated coconut

Desiccated coconut is obtained by drying of shredded, ground coconut after separating from the brown testa. The fresh matured coconuts are de-husked and de-shelled. The de-shelling is done by a sharp knife to get the kernel, and the kernel is disintegrated into smaller size using hammer mill or pin mill. The coconut flakes are steam blanched for about 20 minutes to reduce the microbial count. The disintegrated kernel is dried in the hot air dryer / vibratory conveyor belt s to reduce the moisture content up to 3%.

The desiccated coconut has more shelf life and easy to transport. It is widely used in confectioneries, baking, puddings and ice creams. Desiccated coconut can be added to foods for its texture, added coconut flavor, garnish for savory foods, as a dusting for the outer layer and as a substitute to raw grated coconut.

Coconut milk

Coconut milk is a natural and very versatile ingredient broadly used in Asian and Indian cuisine. It is an oil-water emulsion obtained from the aqueous extract of coconut meat. The coconut kernel is disintegrated using rotary wedge cutter, then it is pressed and squeezed with hot water to extract the milk from the kernel. After extraction milk is filtered to remove the solids then it is pasteurized to eliminate the micro organism. Coconut milk is considered as a substitute for cow milk and can be used by lactose intolerant people. The fresh coconut milk serves as a valuable food for children suffering from nutritional deficiency. It has more vitamin A content than coconut itself and has adequate minerals.

Coconut cream

Coconut cream is mainly used as a source of fat, is similar to coconut milk but has a thicker and paste like consistency than coconut milk. Addition of food additives like emulsifiers and stabilizers to coconut milk are involved during the production of cream. This mixture is mixed well to get the desired consistency and it is moved to the plate heat exchangers for pasteurization (80°C) and hot filled into the container. It has a shelf life of nearly 6 month once opened. It can be used directly or diluted with water to make various preparations such as

fish and meat dishes, curries, sweets, deserts, puddings, cakes, cookies, jam, ice creams etc.

Spray Dried Coconut Milk powder

Coconut milk powder is the dehydrated form of coconut milk. This product has a good keeping quality and retains the natural flavor, texture and taste of coconut milk. CDB in collaboration with the CFTRI has developed technology for spray drying of coconut milk, which is the most potential method for preservation of flavour and texture of coconut milk with good keeping quality.

Flavoured coconut Juice

A technology for processing flavoured coconut juice has been developed by CDB Institute of Technology. Fresh green nuts of 9-10 months maturity are more suitable for processing of flavoured milk. The milk extracted from young fresh nut is thick and less in fat content. The fresh nut water is also mixed with the extracted juice so as to enrich the nutrient contents. Consistency is made in such a way to get an acceptance as a ready to drink beverage. On an average, 800 – 1000 ml flavoured coconut juice is obtained from one nut.

Coconut Flour

Coconut flour refers to the screened food-grade product obtained after drying, expelling and/or extracting most of the oil or coconut meat. The granulation is dependent upon the degree of grinding and meshing to which the raw material has been subjected and varies from 30-250 mesh. Coconut flour is proven to be a rich source of dietary fibre.

Coconut chips

Coconut chip is a ready to eat snack prepared from 9-10 months old coconuts. It can be prepared by dehydrating the intermediate moisture coconut kernel. Intermediate moisture coconut kernel is the mature coconut kernel after removing the moisture content of the kernel partially by osmotic dehydration by using osmotic mediums like sugar syrup. Coconut chip is crispy and can be packaged and marketed in laminated aluminium pouches, which will have a shelf life of six months. Since it is in ready-to-eat form, it could be used as snacks at any time. Coconut chips with different flavours can be prepared by adding the required flavour essence in the osmotic medium.

Coconut chunks

Coconut chunk is a delicious snack prepared from fresh coconut kernel by means of osmotic dehydration. Sweet coconut chunk is in the ready to eat form. It is chewy and candy like and is similar to the traditional Indian sweet Agra petha prepared from cucumber.

Virgin coconut oil (VCO)

Virgin coconut oil is the purest form of coconut oil, water white in color which has not undergone oxidation. It is the oil obtained from the fresh and mature kernel of coconut by mechanical or natural means, with or without the use of heat, without undergoing chemical refining, bleaching or deodorizing, and which does not lead to the alteration of the nature of the oil. Fatty acid composition of VCO is predominantly Lauric (48%). Monolaurin, derived from the Lauric Acid is having antimicrobial, antiviral and antifungal effects in the body.

Apart from this, there are many other edible products which can be prepared from coconut kernel like coconut yogurt, coconut cheese, margarine, mayonnaise, icecream, pinacolada, coconut syrup, coconut jam, coconut noodles etc.

The healthy drink- Matured Coconut Water

Matured coconut water is a source of various food items. It contain 4-6% sugar. Products like vinegar, squash etc could be prepared from matured coconut water.

Bottled Coconut Water

Matured coconut water can be used as a ready to drink beverage if properly preserved and packed. It can be carbonated and used as a soft drink.

Coconut water concentrate

Coconut water can be concentrated by using spray evaporation technique. The products has a shelf life of 6 to 24 months depending upon the degree of concentration. The concentrate could be used to prepare aerated & bottled Ready To Drink beverages.

Coconut Vinegar

Coconut water can be converted into vinegar by using vinegar generators. The process involves fortification of coconut water with sugar, fermentation by inoculation of yeast and then mother vinegar, oxidation and acidification. Vinegar has extensive use as a preservative in the pickle industry and flavouring agent in food processing sector. Natural vinegar enjoys export market in place of synthetic vinegar prepared from commercial acetic acid.

Nata-de-coco

Nata de -coco is a gelatinous product prepared from mature

coconut water by the action of cellulose forming bacteria namely Acetobacter aceti subspecies xylinium. The culture solution is prepared by mixing coconut water with sugar and acetic acid at a stipulated proportion, which is inoculated with Acectobacter xylinium through a culture liquid. It is filled in glass jars covered with thin cloth and kept for 2-3 weeks without any disturbance. During this period a white colored jelly like substance forms and floats on the top of the culture medium. It is harvested, cut into pieces and washed in pure water to remove all acids, immersed in flavoured sugar syrup for 12 hours and packed in glass bottles. It is an excellent ingredient for sweet fruit salads, pickles, fruit cocktails, drinks, ice cream, sherbets and other recipes.

CDB has developed a technology under laboratory conditions for the production of nata-de-coco from matured coconut water. Various other products like coconut water based beverages, coconut treacle, coconut lemonade etc could be prepared by value addition of matured coconut water.

Tender Coconut – The natural delicacy

Tender coconut is the gift of nature. It is the liquid endosperm obtained from young coconut (6 - 8 months) which makes pure, nutritious and wholesome natural beverage. The sterile water, which is approximately 200 – 750 ml, is enclosed in a hard shell and a well- lined layer (8 – 10 mm) of coconut meat. It can be processed to yield a natural nutritious drink and can be blended with fruit juices to yield nutritious beverages.

Packaged Tender Coconut Water

Coconut Development Board (CDB) in collaboration with the Defence Food Research Laboratory (DFRL), Mysore has developed a technology for preservation and packing of tender coconut water in pouches and aluminum cans. The DFRL, Mysore has succeeded in retention of its flavour when packed in pouches/aluminum cans for a period of three months under ambient conditions and six months under refrigerated conditions. The product has acclaimed consumer acceptance throughout the country.

Minimal Processing of Tender coconut

Perishability of tender coconut is relatively high and once the tender coconuts are detached from the bunches its natural freshness will get lost within 24 to 36 hours even under refrigerated conditions unless treated scientifically. The bulkiness of tender coconut is due to the husk which accounts for two-third of the volume of tender nut. Handling of tender coconuts will be easy if a major part of the husk is removed. But, when partial removal of husk is done the colour of the nut will be changed to brown thereby reducing the attractiveness of the nut.

Technologies for minimal processing of tender coconut have been developed for retaining the flavour and to prevent discolouration. The process involves dipping (partially) dehusked tender coconut in an anti browning solution for five minutes. The product can be stored up to 24 days in refrigerated condition at 10-12^{0}C. By using this process, tender - coconut can be transported to distant places and served chilled like any other soft drink. Optimized uniform size facilitates using of plastic crates and insulated chill boxes for transporting and storage.

Snow Ball Tender Nut

Snow ball tender nut is tender coconut without husk, shell and testa which is ball shaped and white in colour. Coconuts of eight months age is more suitable for making snow ball tender nut in which there is no increase in quantity of tender nut water and the kernel sufficiently soft

Fruit juice blended tender coconut water

Process for preparation of fruit juice blended tender coconut water beverage using pomegranate, blue grapes, pineapple, mango and lemon juice have been standardized by Central Food Technological Research Institute (CFTRI) under sponsored project of CDB. Storage studies of these products at room temperature revealed that the beverages were safe for consumption for a period of six months.

Neera Coconut Inflorescence Sap, the hidden miracle

Coconut inflorescence when tapped yields a vascular sap called neera which is rich in sugar, amino acids and vitamins. This sap can be processed to yield a nutritious health drink. Various value added products can also be prepared from coconut sap namely coconut sugar, coconut jaggery, coconut honey, syrup and various other value added products.

Other than the products mentioned above, coconut can be utilized for the preparation of various bakery and confectionary items like chocolate, cookies, cake, bread, jam squash, candy, pudding, ice cream, pickle, burfi, ladoo etc. the possibilities of which can be utilized by self help groups/individuals for starting a micro enterprise.

Demonstration of Technologies under CDB

Technical knowhow of the coconut food products is available with Coconut Development Board. CDB Institute of Technology is conducting hands on training programmes which cover most of the economically viable products. ■