

Home Scale Virgin Coconut Oil Production

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Coconut palm is one of the important plantation crops cultivated in all coastal states, few interior states and North Eastern states in India. The palms are cultivated in plantations in larger areas in addition to lakhs of homesteads for personal consumption and local sale. The coconut palm has multiple uses from roots to leaves and supports many industries such as food, oil, beverages, sugar, coir, biodiesel and handicrafts. Although several uses are reported, coconuts are primarily and traditionally used for production of oil meant for food and industrial purposes. Coconut oil is one of the oldest known edible vegetable oils around the world, but the use of it for food purpose has greatly reduced over the years due to the promotion of other edible oils in different parts of world. In the recent years, coconut oil is again gaining importance and being promoted as one of the healthiest oils due to its high quality and health promoting nature.

The virgin coconut oil (VCO) is preferred over the traditional coconut copra oil by consumers for food, medicinal and cosmetic uses. As everyone knows, generally coconut oil is extracted from the copra made from kernels of mature coconuts. The copra is the dried kernel of coconut. On the other hand, Virgin Coconut Oil differs from the ordinary coconut oil in the way it is extracted from fresh kernels and in terms of its quality and reported health benefits. The term 'virgin' is given to mean oil produced without or very less heat during the process. Virgin coconut oil has a stronger taste and fragrance of fresh coconut and reportedly possesses higher content of antioxidants, protein, vitamins and healthy fatty acids. The VCO is increasing being preferred by people for food and cosmetic uses. Although many commercial brands and local brands of VCO are available in the market, still large number of coconut oil consumers show

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apprehensions about the quality of VCO in the market. It is well known that the traditional coconut users in different coconut growing regions have their own methods of extracting oil from the coconut kernel, which they prefer for food and cosmetic purposes at home or community level.

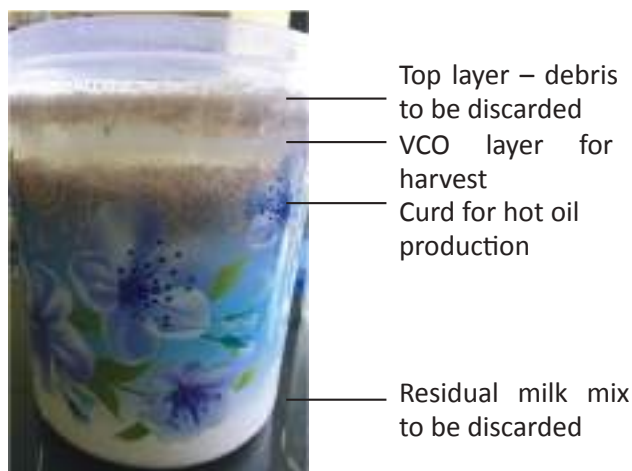
For commercial scale production of VCO, there are standardized technologies available which include direct expelling, centrifuge method or cold pressing, fermentation and hot process method using machineries ranging from coconut dehuskers, shell removers, testa removers, graters, milk expellers or milk squeezers, centrifuge, fermentation tanks, cookers, filters, packing machines and so on. Depending on the capacity of oil production units, these machineries are designed from 100 nuts capacity to thousands of nuts per day. Most VCO producing companies employ one of these methods to get oil extracted from fresh coconut kernel with or without further refinement of oil.

It is always felt that a simple technology in line with traditional coconut oil extraction with available instruments and utensils at home will be helpful to the home makers to produce and meet their own family needs of coconut oil using their own coconuts.

Among the methods of VCO production, the fermentation method followed by hot process method is considered as the cheapest and efficient method which could be employed at even lower capacity units with lesser cost. It can be employed even at home kitchen using usual available utensils and tools. In this article, a low-cost, simple methodology for home-scale VCO production at an average Indian home is explained. The methodology could be used even in remote localities with limited facilities and low energy consumption to produce VCO within 20 hours from fresh coconuts with involvement of family labour or as a pass time. The steps including Do's and Don'ts of home scale VCO production are as follows.

Steps

- To produce good quality VCO, freshly fallen or freshly harvested, ungerminated coconuts are to be selected. Care should be taken to avoid the fully dried coconuts without nut water or germinated coconuts as the kernel from these spoiled coconuts may contaminate the mixture giving a bad odour or rancid smell for the resultant oil.
- The fresh, good quality coconuts are to be husked, split into two halves. In case any decay or germination of nuts is noticed at this stage, such nuts should be rejected for VCO production and it could be used for drying to make copra.
- The good white kernels are to be grated and then pressed in a cloth (If the grating appear to be is coarse then it could be further pulverized in a blender/mixer grinder available at home kitchen) to extract the milk. For grating the kernel, either the traditional tools or electric operated grating machines can be used whichever available.
- The milk is then filtered using double cloth or a fine nylon net. The kernel residue after extraction of milk could be used to feed farm animals which may prefer to eat.
- The filtered milk is then to be measured and diluted with equal quantity of warm water. If any water is added when grinding in the blender that should be taken into account. ('Warm water' can be made by mixing 2 parts of boiling water with 3 parts of normal water). Suppose 500 ml is obtained, it should be diluted with 500 ml of warm water.
- The mixture is to be poured in stainless steel container or good quality plastic container or glass container which should have a wider opening. The wider mouthed vessel is preferred for ease of oil harvest after separation.



Different layers in the container after fermentation of coconut milk mix

- The container is to be covered with a lid and the entire set up is to be kept in a room at warm and dark condition. To make it warm, the containers could be covered with thick clothes or blankets or towels and to be left undisturbed.
- After about 16 to 18 hours, the milk mix will be ready for harvesting VCO.
- Slowly open the lid, there will be four layers in the milk mix. The top layer will usually be very thin containing the floating debris. When carefully removed and discarded, the second layer will be the pure VCO.
- Using a stainless-steel spoon, the pure VCO can be harvested and filled in a bottle or convenient container. While harvesting this second layer, care must be taken to ensure that it does not mix with third layer, which is like curd.
- After maximum possible harvest (without mixing with the curd layer), the left-over oil along with curd (third layer) can be harvested separately and collected. If the curd with little oil is boiled in a thick pan with constant stirring, a highly aromatic hot coconut oil could be obtained which could be useful for cosmetic purpose at home.
- The fourth bottom layer is watery and must be discarded. It could be used for watering the plants at home.
- Coming to the harvested VCO from second layer, the oil may still contain tiny water particles and other debris and hence to be filtered using pure cloth twice. The resultant oil should be clear like water.
- Then the oil could be shifted to a glass container or

stainless-steel container and kept in open sunlight for about 8 to 10 hours. This will purify the oil further and remove any residual moisture present in the oil as minute droplets.

- The oil thus obtained could be stored upto 4 months without much problem of rancidity.
- This pure, homemade, edible VCO could be used for family consumption as well as for sale at local markets to the needy people.

Tools, material, manpower and output

The required materials for the home processing of VCO are good quality matured coconuts, a knife to husk and split open the coconuts, coconut grater or scraper, mixer grinder, cloth for pressing and filtering or nylon filter, stainless steel container or plastic bucket, spoon, bottles or stainless-steel container for VCO storage. For hot oil production, a kadai and stove for boiling is required.

A single person/ homemaker can handle about 15 to 20 medium sized coconuts a day for this home scale VCO production using house-hold articles from which about 1.5 litres of VCO could be produced. In addition, about 500 ml of hot processed oil also could be obtained. Depending on the efficiency and skill improvement over time, this could be increased up to 30-40 coconuts a day per person. The oil produced from one day effort using 15 to 20 coconuts may be sufficient for a family of four for a fortnight or month depending on normal usage. The kernel residue after squeezing the milk can be used in food preparations and or as animal feed. The hot oil from curd mixture will usually be more aromatic and preferred for cosmetic uses. The variety wise VCO recovery from fermentation of milk is as follows.

VCO recovery from different cultivars

Studies conducted at ICAR-CIARI Port Blair with over 30 different coconut accessions and cultivars using this simple method revealed that different cultivars vary over final yield of oil, recovery of VCO from milk, amount of hot oil clarity of oil etc. VCO was recovered from milk extracted from good quality 11 to 12-month-old coconuts from all the accessions using fermentation method at room temperature. Fresh kernel was grated using coconut grater; pulverized using a mixer grinder and the milk was squeezed out using nylon cloth. Milk and water mix at 1:1 ratio was fermented exactly for 18 hours and the VCO was harvested using spoon manually. Among the tall accessions from Pacific Ocean collections

Acc 17 recorded highest VCO recovery of 38% of kernel weight followed by Acc 4 (36.1%) and Acc 13 (34.7%). Higher recovery of VCO was also recorded in the accessions 1, 2 and 28 with about 30% recovery based on fresh kernel weight. Among all the dwarf accessions, Acc 18 has recorded the highest VCO recovery of 34.7%. The evaluation revealed wide variation for fruit component traits and the VCO recovery over different cultivars and varieties.

Other traditional methods

The above described fermentation method is generally practiced by local people across different coconut growing regions of the world with slight modifications as per the local conditions. They differ slightly in the selection and handling of fruits from selected coconut varieties, grating size, milk extraction methods, use of location-specific containers, use of herbs or portion of haustorium or matured or tender coconut water as additives in the milk mix, fermentation conditions, methods of filtering and sterilizing the oil, packing and storage etc.

Success story

Coconut is the predominant crop in Andaman and Nicobar Islands, widely cultivated in all the habituated Islands in about 20000 ha. Most of the coconut production from the islands goes for copra production and direct consumption. About 2 to 3 per cent of fruit production is used for other products including tender coconuts. Coconut palms produce fruits throughout the year and the nuts are available round the year. Owing to the lock down due to COVID-19 spread control, the coconuts were gathered in surplus around the palms, plantations and households in the islands. Using the COVID time advisory released from ICAR-CIARI, many farm women, farmers and home makers in Port Blair and surrounding areas started producing Virgin Coconut Oil (VCO) from the available coconuts at their home utilizing their leisure time which yielded high quality pure coconut oil at several homes. The users have indicated that they obtained oil recovery ranged from 900 ml to 1200 ml from 10 medium-sized coconuts of Andaman Ordinary Tall

Retirement



Dr. Rajat Kumar Pal, Director retired from the services of CDB on 31st December 2025 after serving the Board for more than 10 years.

cultivar. By this way, they could effectively use and add value to their coconut produce which otherwise could have fetched very low price. Interaction revealed that most of these small scale producers used the home made VCO for the consumption at family level and few others sold the excess oil in the local markets for interested fellow islanders. Now, after three years, few of them has taken this simple method to continue their VCO production at home level successfully as an entrepreneurship opportunity in and around their households.

Conclusion

This simple method of home scale VCO production can be very well followed by any small-scale farmers, agricultural labourers, home homemakers and coconut enthusiasts. They can engage themselves during their leisure time in a productive way. Apart from self consumption, if sales are ensured through local contacts, the venture will be very much profitable without much additional investment. The home made VCO can also meet edible oil requirement of family thereby strengthening self sufficiency and help in ensuring the consumption of healthy coconut oil. If the same method is applied at the community level with shared resources and quality assurance, VCO production can be increased with higher efficiency and profitability. ■

विर्जिन नारियल तेल Virgin Coconut Oil

नाम है मेरा विर्जिन
और स्वास्थ्य है मेरी शान

Virgin is my name
and health is my fame

