

# **Virgin Coconut Oil (VCO) Processing Plant**

- **Market Research and Survey**
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- **Feasibility Study**
- **Manufacturing Plant**
- **Raw Materials**
- **Machinery**
- **Plant Layout**



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**COCONUT PROCESSING MACHINERY  
MANUFACTURERS**

**VIRGIN COCONUT OIL PLANT MACHINERY**

**COCONUT MILK PROCESSING PLANT  
MACHINERY**

**DESICCATED COCONUT POWDER PLANT  
MACHINERY**

**COCONUT CHIPS PLANT MACHINERY**

**COCONUT FLAKS MACHINERY**

## **VIRGIN COCONUT OIL (VCO) INTRODUCTION**



**Virgin coconut oil (VCO)** extracted from fresh coconut meat without chemical processes is said to be the mother of all oils. It is rich in medium chain fatty acids, particularly **Lauric acid** and is a treasure trove of minerals, vitamins, antioxidants and is an excellent nutraceutical.

It has about 50% -60 % Lauric acids, having qualities similar to mother's milk thus confirming its disease-fighting ability, Where lauric acid enters human body its get converted to Monolaurin which has the ability to enhance immunity.

Several studies have confirmed that this compound has the ability to kill viruses including herpes and numerous other bacteria. Its antiviral effect has the ability to considerably reduce the viral load of HIV patients.

VCO is not subjected to high temperatures, solvents or refinement procedures and therefore retains the fresh scent and taste of coconuts. It is rich in vitamin E, is non- greasy, non-staining and is widely used in soaps, lotions, creams and lip balms. The health benefits of VCO are second to none; ranging from speeding up body metabolic system and providing immunity against a horde of commonly prevalent diseases.

Virgin Coconut Oil (VCO) is extracted from fresh coconut milk obtained from matured coconut of 12 months old. VCO can be consumed in its natural state without the need for further processing.

## Essential Composition and Quality factors of VCO as per APCC\*

(\*Asian and Pacific Coconut Community)

| Sl. No. | Parameters                            |                                                                                               |
|---------|---------------------------------------|-----------------------------------------------------------------------------------------------|
| 1       | Moisture (%)                          | Max 0.1                                                                                       |
| 2.      | Matters Volatile at 1200 C (%)        | Max 0.2                                                                                       |
| 3.      | Free Fatty Acid (%)                   | Max 0.2                                                                                       |
| 4.      | Peroxide Value meq/kg                 | Max 3                                                                                         |
| 5.      | Relative density                      | 0.915 – 0.920                                                                                 |
| 6.      | Refractive index at 400 C             | 1.4480 – 1.4492                                                                               |
| 7.      | Insoluble impurities per cent by mass | Max 0.05                                                                                      |
| 8.      | Saponification Value                  | 250 – 260 min                                                                                 |
| 9.      | Iodine Value                          | 4.1 -11                                                                                       |
| 10.     | Unsaponifiable matter % by mass       | max 0.2 - 0.5                                                                                 |
| 11.     | Specific gravity at 30 deg./30 deg. C | 0.915 – 0.920                                                                                 |
| 12.     | Polenske Value                        | min 13                                                                                        |
| 13.     | Total Plate Count                     | < 0.5                                                                                         |
| 14.     | Color                                 | Water clean                                                                                   |
| 15.     | Odor and Taste                        | Natural fresh<br>coconut<br>scent,<br>free of sediment, free<br>from rancid odor and<br>taste |

### Raw Material Requirement

It is assumed that to produce 1 litre of VCO, 7 kg of De husked coconut is required, which is around 17 coconuts.

## ➤ **Market Research and Survey**

**The global Virgin Coconut Oil market is valued at 650 million US\$ in 2018 and will reach 780 million US\$ by the end of 2025, growing at a CAGR of 2.3% during 2019-2025.**

Virgin Coconut Oil (VCO) is growing in popularity as functional food oil and the public awareness of it is increasing. It is expected that VCO will experience a dramatic growth in the market.

Currently, the factors driving the growth of the aforementioned industry are food consumption, cosmetic and others. As the demand increases rapidly for downstream industries, and the wider range of applications, the demand for coconut oil will correspondingly increase. The increased consumption of coconut oil is expected to continue during the remaining years of the forecast period of 2017-2022. Virgin coconut oil industry will usher in a stable growth space.

Almost all Virgin Coconut Oil products in Europe, North America and China are imported from other countries, such as Philippines, Indonesia. On a global scale, currently coconut oil industry is in the state of production and consumption booming.

### **End User Markets:**

- ✓ **Food**
- ✓ **Beauty and Cosmetics**
- ✓ **Medical**

## Market by Region:

- ✓ North and South America
- ✓ Asia Pacific Countries
- ✓ Europe
- ✓ Middle East & Africa

### ➤ Machinery

- ✓ Dehusking Machine:
- ✓ Deshelling Machine
- ✓ Shredder Machine
- ✓ Pilveriser Machine
- ✓ Washing Sscrew Conveyor
- ✓ Conveyors
- ✓ Coconut Milk Extractor Machine
- ✓ Milk/ Oil collection tank
- ✓ Circle Vibratory Stage Filter
- ✓ Clarifier/ Cream Separator
- ✓ Centrifuge
- ✓ Micro Filter
- ✓ Milk Chiller
- ✓ Electric oven
- ✓ Self Priming Pump
- ✓ Packing and Bottling Machines

### ➤ Raw Materials

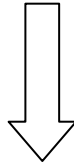
It is assumed that to produce 1 litre of VCO, 7 kg of **De husked Coconut** is required, which is around 17 coconuts.

## ➤ PROCESS FLOW



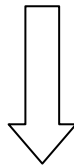
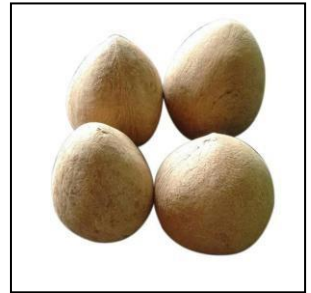
### De Husking

Husk is removed manually or with the help of coconut de husking machine

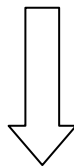


### De Shelling

It is done to remove the shell of the coconut. This is done without breaking the kernel.

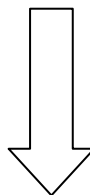


### BROWN SKIN REMOVING (MANUAL PROCESS)



### FEEDING CONVEYOR

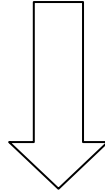
(Brown Skin removed Coconut to be feed through Feeding Conveyor to Shredder for making the coconut into chips or small pieces)





## SHREDDING MACHINE

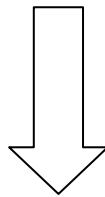
Shredding machine is used to shred the brown skin removed Coconut Kernels into small pieces before pulverising process.



## WASHING SCREW CONVYOR

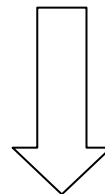
In this stage, Shredded Coconut Pieces will be washed and feed into Pulveriser Machine for make the

Coconut Kernel Pieces as power form.



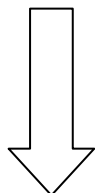
## PULVARIZER MACHINE

Pulveriser Machine used for make the Coconut Kernel Pieces as power form.



## FEEDING CONVEYOR

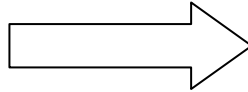
(Pulverised Coconut Powder to be feed through Feeding Conveyor to Coconut Milk Extractor Machine)



## COCONUT MILK EXTRACTOR MACHINE

Coconut Milk Extractor is used for Extract Coconut Milk from the Coconut Powder.

For 100 KG of Coconut Kernel with 70 % yielding capacity of the Machine will get 70 KG Coconut Milk and 30 KG Low Fat Wet Powder.



Low Fat Wet Coconut Powder



### Electric Oven

Electric Oven is used to convert the Low Fat Wet Coconut Powder into Low Fat dry DC Powder



Low Fat dry DC Powder



PACKING and STORAGE

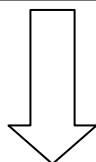


RAW COCONUT MILK



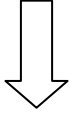
### CIRCLE VIBRATORY STAGE FILTER

This Machine is used for filter the Pure Milk by removing the solid and fine particles from the Raw Coconut Milk which has extracted from Coconut Milk Extractor Machine.



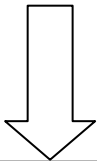


Pure Coconut Milk

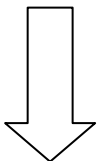


## CLARIFIER

This machine is used to separate the solid particles from Coconut Milk

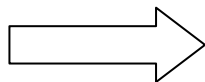


Solid Parts  
Removed

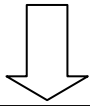


## CENTRIFUGE

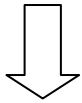
This process is used to separate two immiscible substances. Coconut milk is the natural oil in water emulsion. After centrifugation, oil and skim milk is separated. Coconut oil is separated from coconut milk.



Skimmed Milk

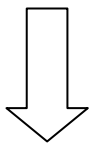


**Coconut Cream**

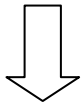


### **Centrifuge**

In this stage Virgin Coconut Oil will be Separated from Milk Cream

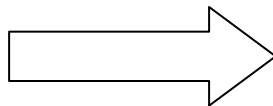


**RAW VIRGIN COCONUT OIL**



### **MICRO FILTER**

Micro filter is used to filter the impurities from the VIRGIN COCONUT OIL



**Pure Virgin Coconut Oil**

To be collected in 200 Litre Cans then to be Bottled and Packed as per requirement.

