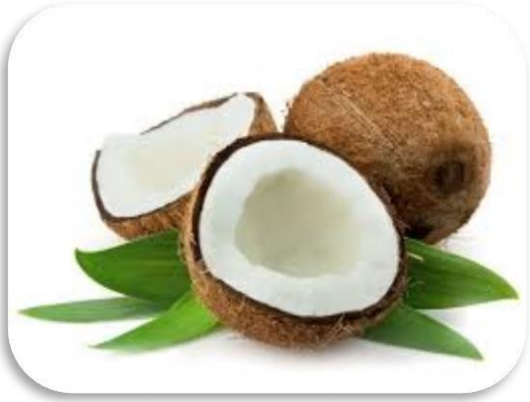
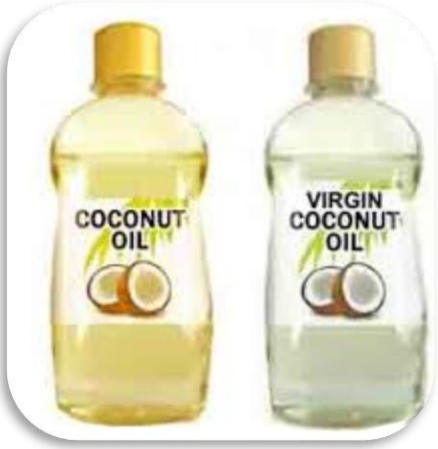
# Project Profile
# On
# Virgin Coconut Oil





## Introduction

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. Virgin Coconut Oil (VCO) is extracted from fresh coconut milk obtained from mature kernel (12 months old from pollination) of coconut by mechanical or natural means, with or without the application of heat, which does not lead to alteration of the nature of the oil. VCO can be consumed in its natural state without the need for further processing. Hence, VCO does not undergo chemical refining, bleaching or deodorizing. Virgin coconut oil is colorless, free of sediment and has natural fresh coconut scent. It is free from rancid odor or taste. Virgin coconut oil consists mainly of medium chain fatty acids. The fatty acids in virgin coconut oil are distinct from animal fats which mainly consist of long chain saturated fatty acids. Virgin coconut oil consists mainly of medium chain fatty acids. The most important medium chain fatty acid found in VCO is lauric acid. It constitutes 48 % of VCO. Lauric acid possess powerful anti microbial properties capable of destroying disease causing bacteria, fungi, viruses and parasites. Researches show that the presence of medium chain fatty acids in mother's milk is the primary ingredient that protects new born infants from infections for the first few months of their life, while their immune system is still developing. Dr.Jon J Kabara, Ph.D of Michigan State University and Consultant, USA has done pioneered studies on the antimicrobial properties of fatty acids in the 1980s. Two of his most important conclusions are that lauric acid is the most active antimicrobial fatty acid and that monolaurin is the most effective antimicrobial compound that can be derived from coco chemicals. According to him, medium chain fats in coconut oil are similar to fats in mother's milk and have similar nutriceutical benefits. VCO has considerable potential for therapeutic uses such as antimicrobial, anti-HIV/AIDS drug, for anti-cancer therapy and for the treatment of Alzhiemer's disease.

VCO is the best possible remedy to various skin ailments. Ms. Vermen M Verallo Rowell, Founder and program Director of VMV Skin Research Center + Clinic (VSRC), Philippine has told that since year 2000, VCO was used at VSRC for patients with dry and often microbially colonized psoriasis, acne, atopic, contact dermatitis and rosacea lesion.VCO is the best skin care solution for babies. Free from all chemical formulations and assures good protection to the baby skin.

Study by Department of Nutrition, University of Indonesia reveals that VCO also helps to improve blood glucose and lipid profile of type 2 diabetics, due to its readiness to provide energy to body cells.

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

| Sl No | Parameters | Limits |
|---|---|---|
| 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 coconut scent, free of sediment, free from rancid odor and taste |

## Raw material requirement

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

## Processing method

De husking of coconuts

▼

Deshelling

▼

Removal of brown testa / pairing

▼

Blanching

▼

Draining

▼

Disintegration

▼

Drying

Milk extraction ► Defatted DC

▼

Centrifugation

▼

Filtration

▼

Packing

**Dehusking**: Husk is removed manually or with the help of coconut dehusking machine. **Deshelling**: It is done to remove the shell of the coconut. This is done without breaking the

kernel.

**Paring**: It is done to remove the brown skin of the kernel with the help of a paring machine.

**Blanching**: Pared coconuts are dipped in boiling water for few minutes in a blanching tank.

**Draining**: It can be done with the help of vibratory screener. This will remove the excess water present in the blanched coconuts.

**Disintegration**: Pared coconuts are fed into a disintegrator where pared nuts are cut into small pieces and will be ready for extraction.

**Milk extraction**: Shredded coconuts are put into a milk extractor (screw press/ hydraulic press) and coconut milk oozes out of the extractor. Extracted milk is collected in collecting vessels. Extracted coconut milk is then filtered to remove if any solids are present. Residue obtained after extraction is dried in an oven and packed a defatted desiccated coconut.

**Centrifugation**: 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.

**Filtration**: The oil is passed through the filter press and packed in consumer packs. Vacuum drying of virgin coconut oil will remove the moisture present in that. This can be packed as "premium grade VCO".

## Draft plan to set up a VCO plant of capacity 300L/ shift

Basic assumptions:

1) Purchase price of dehusked coconut= Rs.20/kg

2) Capacity utilization of the plant= 60% in year 1, 70% in year 2, 80% in year 3 and 90% in subsequent years

3) Selling price of VCO= Rs.48/ 100 ml

4) Sales and distribution expenses= 40% of sales realisation

5) Mode of financing the project= 40% of cost of project by equity and 60 % by long term loan from financial institutions

## Capital Investment cost of the project

| Sl No | Item | Amount (Rs. in lakhs) |
|---|---|---|
| 1. | Land (30 cents) | Leased |
| 2 | Building (3500 sq. feet @ Rs.1000 sq. feet) | 35 |
| 3 | Other civil works (internal roads, compound wall, water tanks) | 2 |
| 4 | Machinery and equipments | 21.05 |
| 5 | Electrification | 3.00 |
| 6. | Effluent treatment plant | 5.00 |
| 7. | Preliminary & Pre-op. expenses | 2.11 |
| 8. | Working capital margin | 4.40 |
| | Total | 72.56 |

## Details of plant and machinery

| Sl No | Item | Qty | Unit cost (Rs. in lakhs) | Amount (Rs. in lakhs) |
|---|---|---|---|---|
| 1. | Dehusker | 2 | 0.75 | 1.5 |
| 2 | Desheller | 2 | 0.6 | 1.2 |
| 3 | Paring unit | 2 | 0.5 | 1 |
| 4 | Coconut disintegrator | 1 | 1.65 | 1.65 |
| 5 | Tubular bowl centrifuge | 1 | 7 | 7 |
| 6. | Spare bowl for centrifuge | 1 | 1.75 | 1.75 |
| 7. | Hydraulic press screw press | 1 | 3.5 | 3.5 |
| 8. | Mixing vessel | 1 | 0.8 | 0.8 |
| 9 | Filter press | 1 | 1.75 | 1.75 |
| | Total | | | 21.05 |

## Project at a glance

| Sl No | Item | At 80% capacity utilization |
|---|---|---|
| 1. | Sales realisation | Rs.345.60 lakhs |
| 2 | Gross profit | Rs.42.12 lakhs |
| 3 | Net profit after tax | Rs.26.36 lakhs |
| 4 | Long term debt | Rs.17.42 lakhs |
| 5 | Net profit after tax on sales | 7.63% |
| 6. | Debt equity ratio | 4.08 |
| 7. | Debt service coverage ratio (DSCR) | 2.92 |
| 8. | Pay back period | 4 years and 2 months |
| 9 | Internal rate of return (IRR) | 18% |
| | Total | 21.05 |

## Income - expenditure per 100ml of VCO

| Particular | Rs. in lakhs |
|---|---|
| Sales revenue | 38.00 |
| Expenses | |
| **Operating expenses** | 21.74 |
| **Administrative expenses** | 1.21 |
| **Sales and distribution expenses** | 9.50 |
| Total expenses | 32.45 |
| **Surplus** | **5.85** |