Consumer Education
VCO Processing Methods
(Dry & Wet Methods)

Premium ANH-VCO
(100% Absolute No Heat Process)
www.cocoscience.com
Consumer Education on VCO...

- Learn what to look for in good quality VCO.
- Learn basic processes involved in producing VCO.

Know how VCO production processes affect VCO quality characteristics and therefore, prices.

- Difference between Premium ANH and others.
- Why is CocoScience Premium ANH-VCO different: safe for raw consumption, fine quality, 24-hour processing, no added chemicals, enzyme, bacteria, 100% true no heat process, potent dual benefits of micronutrient plus lauric acid.
Questions Consumer Ask…1

- **How do I know which VCO to buy?** Choose reputable brand & supply source, proper labeling, preferably Premium ANH grade for raw consumption.

- **Why are some VCO cheap and others so expensive, especially Premium ANH VCO?**

  Premium ANH VCO is difficult to produce. Premium grade coconut is used. The process is quite tedious due to various measures undertaken to ensure quality parameters are met. Contains potent natural micronutrient plus lauric acid. Low price = low grade.
Questions Consumer Ask...2

- **Is VCO from volcanic area better?** Volcanic soil is rich in minerals which increases the production of more coconuts per tree. Minerals are water soluble and found in the flesh and water portion of the nut. They are not oil soluble hence not available in VCO.

- **Why is the logic of saying VCO is highly stable but still packed in brown bottle to prevent oxidation?** Good quality VCO is highly stable and is usually packed in colorless bottle. They will not oxidize even when exposed to occasional sunlight. If the quality of the VCO is questionable, then it is better to pack in brown bottle as an insurance.
Prevailing Standards on VCO…1

- **VCO Definition…**
  - Oil from fresh, mature kernel coconut.
  - By mechanical or natural means.
  - With or without the use of heat.
  - No chemical refining, bleaching or deodorizing.
  - Suitable for human consumption without further processing.
Prevailing Standards on VCO...2

- **Ranges of Fatty Acid composition..**
  - Lauric acid (C12) – min 45/max 53%

- **Quality Characteristics..**
  - Clear & Near Colorless (1 Yellow 0.1 Red)
  - Sediment free
  - Natural fresh *coconut* scent
  - Free from rancid odors or tastes
Prevailing Standards on VCO...3

- Property requirements:
  - Moisture 0.30% max.
  - Free Fatty Acid as lauric (C12) 0.30% max.
  - Peroxide Value 3.0 meq/kg max.
  - Food Additives – NOT PERMITTED.
  - Processing Chemical, Enzymes & Bacteria – None.
Labeling Details…

Ministry of Health Malaysia :- Food Act 1983 & Food Labeling Act 1985..

- Name of Product: Virgin Coconut Oil.
- Brand or Trade Name (optional).
- Net Content.
- Name and Address of manufacturer and/or packer, distributor.
- Country of manufacture.
- Nutritional Information.
- Type of Process (optional locally).
- Expiry Date.
- Bar code (optional).
Consumer Feedback...

1. Mostly on physical characteristics: - Premium VCO clear glass bottle – rich taste, General VCO brown glass or plastic bottle – bland taste. Appearance - clear oil. Odors - light, strong, smokey or sour depending on quality.

2. How can VCO benefit me: - The immediate effect and long term effect of consuming VCO. Better resistance against sickness, improve immune system, better absorption of food nutrients, etc.
Sensory Quality Criteria For Food and Skin Care VCO...

Preferences

- Feel: Light to Medium, easily absorbed by the skin.
- Taste: Not Rancid, fresh coconut aroma, smooth.
- Smell: Fresh coconut, Not Burnt, not Sour.
- Pure: Unadulterated clear liquid.
VCO As “Advertised”......
What the Consumers Are Looking For?

- All Natural, No Additives but **UNSURE** about added enzyme & bacteria.
- Fresh, Matured Nuts.
- Chemical Characteristics – lauric acid? What’s that?
- Micro-nutrients (Vitamin E).
- Sensory Characteristics..
  - Fresh Coconut Taste.
  - Fresh Natural Coconut Aroma.
  - Light and Non-Greasy.
VCO Production Processes

Cold Pressed, Cold Processed, Dry Process, Wet Process, Low Heat ...

CONFUSED?
## Objectives of VCO Producers

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Why?</th>
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<tbody>
<tr>
<td>1. Process in shortest time possible</td>
<td>freshness, palatable, Less fermentation / oxidation</td>
</tr>
<tr>
<td>2. Reduce moisture to 0.30% (standard)</td>
<td>Longer shelf-life, avoid rancidity</td>
</tr>
<tr>
<td>3. Apply least possible heat</td>
<td>Preserve natural potency of Vitamin E</td>
</tr>
<tr>
<td>4. Maximize oil extraction from nut (No. of Nuts / L); Recovery of By-Products</td>
<td>Profitability, Lower Costs</td>
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</table>
Standard **Theoretical** Process Route for coconut oil extraction...
Standard Theoretical Production
Process Routes – Dry or Wet methods

Two Basic Issues – oil separation & drying...

1. Oil separation:
Removing the solids and most of the water or moisture from the material (*coconut* milk or grated meat)

2. Oil drying:
Removing moisture content from the oil

Fresh Coconut
Meat

Preparation
Expelling

Solids – Water – Oil Separation

Moisture Drying
Actual *Fresh* Coconut Oil Extraction DRY Method

1. Dry Process (taking oil out of dried kernel meat).

- Preparation
- Expelling
- Solids – Water – Oil Separation
- Moisture Drying

**Fresh Coconut Meat**

**Preparation**
- Drying, whole or grated meat
- Low Pressure, hydraulic press eg. DME process
- Screw Press, High Pressure

**Expelling**

**Solids – Water – Oil Separation**

**Moisture Drying**

- Settling/Decanting
- Cooking, Direct Heating
- Double Boiler, Indirect Heat
- Steam
- Pasteurizing
- Vacuum Evaporation

None
Actual Fresh Coconut Oil Extraction WET Method

2. Wet Process (taking oil out of coconut milk).

- Fresh Coconut Meat
  - Preparation
    - Expelling
      - Solids – Water – Oil Separation
        - Moisture Drying
  - Grating
    - Cold Pressing for Coconut milk/suntan.
      - stone mill
      - manual or hydraulic driven presses
    - Fermentation, Enzymes/Bacteria
    - Cooking, Kitchen Method
    - Mechanical Centrifuge
    - Physical Cold Extraction
    - Settling/Decanting
    - Cooking, Direct Heating
    - Double Boiler, Indirect Heat
    - Steam
    - Pasteurizing
    - Vacuum Evaporation
**Actual Fresh Coconut Oil Extraction WET Method**

3. Added Enzyme/Bacteria/Additive/Chemical Process (reaction to dislodge oil from *coconut* milk complex).

- **Coconut Meat**
- **Water**

  **Wet Grinding**

  **Temp. Adjustment**
  **pH Adjustment**
  **Enzyme* &/or Bacteria# added**

  **Incubation**

  **Centrifugation**
  **Water – Oil – Solids Separation, Oil Drying**

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*Protease enzyme added.

#Bacteria process known in Malaysia as “biotechnology process”.

Minimum 20 hours incubation
Cold Pressed & Cold Processed VCO?

Cold pressed applicable to coconut milk extraction only. The rest of processing may be called cold processing. Some heating is needed to remove latent water from final oil, unless it is ANH. **True** cold processed means **absolute no heat** throughout the whole process and will be labeled as **ANH VCO**, which is safe for raw consumption.

You Decide!
Cold Pressed and/or Cold Processed VCO
Applicable only in Wet Process via Coconut Milk...

- Ferment / Enzymatic/ Bacteria
- Cook (Kitchen Method)
- Mechanical Separation (Centrifuge)
- Physical Extraction Technology

Milk Extraction From coconut gratings/meat

Water – Oil Separation

VCO Drying

Filtration

- Settling / Decanting
- Double Boiler (Indirect)
- Direct Heating
- Vacuum Evaporation
- Absolute No Heat (ANH)

VCO Process Name ... Cold Pressed &/or Cold Processed (ANH) VCO.

Eg. Physical Extraction, Centrifuge, etc.
# VCO Process Description

<table>
<thead>
<tr>
<th>Separation Technique</th>
<th>Moisture Removal Method</th>
<th>Common Process Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooking</td>
<td>Cooking, heating, evaporation</td>
<td>Traditional Kitchen Method</td>
</tr>
<tr>
<td>Fermentation / Enzymatic</td>
<td>Settling, decantation, evaporation (4 wks process) <strong>Absolute No Heat</strong></td>
<td>Natural Fermentation <strong>ANH</strong> process</td>
</tr>
<tr>
<td>Fermentation / Enzymatic</td>
<td>Heating &amp; evaporation</td>
<td>Fermented - Pasteurized</td>
</tr>
<tr>
<td>Fermentation / Bacteria</td>
<td>Settling, decanting, low heating &amp; evaporation</td>
<td>Biotechnology (local Malaysian process)</td>
</tr>
<tr>
<td>Centrifuge (Batch system)</td>
<td>Heating, Pasteurization, Steam, Double Boiler, evaporation</td>
<td>Centrifuged – Pasteurized</td>
</tr>
<tr>
<td>Centrifuge (Batch system)</td>
<td>Vacuum Evaporation</td>
<td>Centrifuge – Vacuum Evaporated</td>
</tr>
<tr>
<td>Physical Separation under Dedicated Centrifugal force</td>
<td>Moisture removed during process <strong>Proprietary Instantaneous Absolute No Heat Process</strong></td>
<td>Physical Cold Extraction <strong>100% ANH</strong> process (eg CocoScience ANH-VCO)</td>
</tr>
<tr>
<td>Direct Oil Expelling, Low Pressure, Quick Dry, Fresh Dry (Direct Micro Expeller)</td>
<td>Direct Heating to remove water in coconut meat/gratings</td>
<td>Low Pressure Direct Cold Expelling – manual hydraulic Press</td>
</tr>
<tr>
<td>Direct Oil Expelling, High Pressure (Expeller Press)</td>
<td>Direct Heating to remove water in dried coconut meat</td>
<td>Forced Expeller Screw Press</td>
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</table>
VCO Quality Quadrant
Basic Characteristics (Smell & Taste) for some VCOs

- **FERMENTATION AND SETTLING**
- **CENTRIFUGE & VAC EVAP’N**
- **FERMENTATION WITH HEATING**
- **CENTRIFUGE & DOUBLE BOILER**
- **KITCHEN METHOD**
- **DME SOLAR DRYING**
- **HIGH PRESSURE EXPPELLING**
- **RBD**

**Basic Sensory Characteristics: Smell & Taste**

- **Bland**
- **Acidic**
- **Smoky / Burnt**
- **Fresh & Natural**

*100% ANH IDEAL*

COCO SCIENCE™
NUTRITION
www.cocoscience.com
Fine Quality Premium ANH-VCO for Raw Consumption