Food Innovation

Value Added Food Products from Palm Oil
A Way Forward

Mohd Muslimin Hashim
Malaysian Palm Oil Council
Malaysia’s Export Performance Vs Indonesia

<table>
<thead>
<tr>
<th>Year</th>
<th>Malaysia</th>
<th>Indonesia</th>
</tr>
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<tbody>
<tr>
<td>2001</td>
<td>10000</td>
<td>5000</td>
</tr>
<tr>
<td>2002</td>
<td>12000</td>
<td>6000</td>
</tr>
<tr>
<td>2003</td>
<td>14000</td>
<td>7000</td>
</tr>
<tr>
<td>2004</td>
<td>16000</td>
<td>8000</td>
</tr>
<tr>
<td>2005</td>
<td>18000</td>
<td>9000</td>
</tr>
<tr>
<td>2006</td>
<td>20000</td>
<td>10000</td>
</tr>
<tr>
<td>2007</td>
<td>22000</td>
<td>11000</td>
</tr>
<tr>
<td>2008</td>
<td>24000</td>
<td>12000</td>
</tr>
<tr>
<td>2009</td>
<td>26000</td>
<td>13000</td>
</tr>
<tr>
<td>2010</td>
<td>28000</td>
<td>14000</td>
</tr>
<tr>
<td>2011</td>
<td>30000</td>
<td>15000</td>
</tr>
<tr>
<td>2012</td>
<td>32000</td>
<td>16000</td>
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</tbody>
</table>

Courtesy: Oil World
Basic Raw Ingredients for Food

Malaysian Palm Oil Export Grade

Palm Fruit

- Pericarp
  - outer oily flesh
- Oil-rich kernel
- Endosperm

To Add Value to Current Export

- Diversify the use of Refined Bleached & Deodorized Palm Oil (RBD)
- Utilization of valuable minor components
Palm Minor components (Phytonutrient Content)

Fat Soluble
• Carotenoids
• Vitamin E
• Phytosterols
• Squalene
• Co-enzyme Q10

Water Soluble
• Phenolic compounds
## DISTRIBUTION OF CAROTENES IN CARROT AND Palm Fruit Oil

<table>
<thead>
<tr>
<th>Carotenones</th>
<th>Source</th>
<th>Carrot</th>
<th>Palm Fruit Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>α-carotene</td>
<td></td>
<td>32%</td>
<td>34%</td>
</tr>
<tr>
<td>β-carotene</td>
<td></td>
<td>63%</td>
<td>60%</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>&lt;100ppm</td>
<td>500 - 700 ppm</td>
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</table>

Source: Malaysian Palm Oil Board
Benefits of Carotenoids Compounds

Anti-Oxidants
Anti Cancer Effects
Stimulation of Immune System
Cardiovascular Protection
Prevent Cataract
## Nutritional Information

<table>
<thead>
<tr>
<th>NUTRITIONAL INFORMATION</th>
<th>15ml</th>
<th>100ml</th>
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</thead>
<tbody>
<tr>
<td>Service Size: 15ml</td>
<td>15ml</td>
<td>100ml</td>
</tr>
<tr>
<td>Energy</td>
<td>510kJ</td>
<td>3,400kJ</td>
</tr>
<tr>
<td>Total Fat</td>
<td>14g</td>
<td>92g</td>
</tr>
<tr>
<td>Cholesterol, sodium, protein, carbohydrate, potassium</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Natural Carotenes</td>
<td>7.00mg</td>
<td>45mg</td>
</tr>
<tr>
<td>- Beta Carotene (pro-vitamin A)</td>
<td>3.3mg</td>
<td>22mg</td>
</tr>
<tr>
<td>- Alpha Carotene (pro-vitamin A)</td>
<td>2.6mg</td>
<td>17mg</td>
</tr>
<tr>
<td>- Other Carotenes</td>
<td>1.1mg</td>
<td>7.3mg</td>
</tr>
<tr>
<td>Natural Vitamin E (Tocopherols &amp; Tocotrienols)</td>
<td>11mg</td>
<td>74mg</td>
</tr>
<tr>
<td>Co-Enzyme Q10</td>
<td>0.6mg</td>
<td>4mg</td>
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</table>

Source: Carotino Sdn. Bhd
Red palm Oil Shortening

Combating Vitamin A Deficiency
Palm Carotenes are natural reddish compounds extracted from crude palm oil.

They contain natural Alpha- and Beta-carotene and a unique mixture of other carotenoids and other bio-active. These bioactives work hand in hand to provide health benefits and good nutrition.
Vitamin E Content

Vitamin E Contents in Oils & Fats

- Tocopherols
- Tocotrienols

Lard
Palm Kernel Oil
Coconut Oil
Olive Oil
Peanut Oil
Sunflower Oil
Cottonseed Oil
Corn Oil
Safflower Oil
Soybean Oil
Palm Oil
Rice Bran Oil

F.D. Gunstone (1996)
Benefits Palm Vitamin E Tocotrienol

Powerful Antioxidant
Stroke Prevention and Protection
Cholesterol Lowering
Kills Cancer Cells
Management of Fatty Liver
Value Added Product - Tocotrienol
Palm Phenolic (water soluble)

Found in water condensate of palm fruit processing

<table>
<thead>
<tr>
<th>Phenolic Compounds</th>
<th>Detection Level (ppm)</th>
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<tbody>
<tr>
<td>Protocatechuic acid</td>
<td>600</td>
</tr>
<tr>
<td>P-hydroxybenzoic acid</td>
<td>7000</td>
</tr>
<tr>
<td>Caffeoyshikimic acid</td>
<td>10800</td>
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</table>
Phenolic Compound (water soluble)

Anti-Cancer Effects
Anti-Oxidants
Anti-Cancer
Anti-Diabetic
Anti-Inflammatory

- Balasundram et al. (2005) Asia Pac J Clin Nutr
Oil Palm Phenolic Drink

Future Potential Health Drink
• Has cholesterol reducing properties & can be added to food to improve its nutritional attributes.

• Research has found that phytosterols also help control and regulate several aspects of the immune response.
Because at 20°C it has 20% solid – hence, suited for formulating solid fat products. It can be easily fractionated to produce different fractions of different characteristics (melting point, solid fat content). Wide range of fat-based food products can be formulated by using these fractions without the need for partial hydrogenation.
Fractionation of palm oil

Various Grades of Palm Oil

- Crude Palm Oil
- RBD Palm Oil

Stearin

- Super Stearin
- Mid Stearin

Olein

- Soft Mid Fraction
- Super Olein
- Mid Olein
- Top Olein

Solid/semi-solid
- Hard Mid Fraction

Liquid

Palm Oil is Very Versatile

Palm Olein Super Olein Palm Mid Fraction Palm Stearin

Crude Palm Oil

Palm Olein Super Olein Palm Mid Fraction Palm Stearin
Palm Fraction Solid Fat Content Profile
Or Melting Curve

% solids

Temp °C

- Stearin
- Hard Mid Fraction
- Soft Mid Fraction
Palm solid fats provide **body** for margarine without the need for HYDROGENATION.

Fine & Stable Crystallizes in the beta prime form
Contains Natural Vitamin E
Formulated by blending various palm fractions.
- Can be formulated with 100% palm or blends between palm & other types of fats/oils
- Acts as Moisture Barrier during baking, hence must have high melting temperature.
- Provide texture
- Longer shelf life
- Give bake goods the characteristic appearance

Non Palm Based Shortening are very heavy on Hydrogenation And typically they have a very high trans fat content
Animal fats supply is quite limited, Non palm Fats have to be hydrogenated.
Confectionary Fats
Coatings / Fillings / Toffees & Caramel

Palm Mid Fraction (PMF) IV 45
Ice Cream

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
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<tbody>
<tr>
<td>Fat (Palm Oil)</td>
<td>11</td>
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<tr>
<td>Skimmed Milk Powder</td>
<td>11</td>
</tr>
<tr>
<td>Sucrose</td>
<td>12</td>
</tr>
<tr>
<td>Glucose Syrup</td>
<td>5</td>
</tr>
<tr>
<td>Emulsifier</td>
<td>0.5</td>
</tr>
<tr>
<td>Flavor</td>
<td>0.1</td>
</tr>
<tr>
<td>Water</td>
<td>60.4</td>
</tr>
</tbody>
</table>
SAFAR: Special Animal Fats Replacer

- Beef Salami
- Smoked Bologna
- Sandwich Beef
- Turkey Toast
- Breakfast Meat
- Turkey Breast
- Beef Frankfurters
- Chicken sausages

Palm Olein + Stearin + Emulsifier
Palm Olein of Highest Quality Used in Leading Infant Formulas
“Coconut Cream Substitute”
Cheese Analogue

Malaysia has commercialized Palm Based Mozzarella Cheese

Texture & Taste is very similar to dairy cheese
Suitable for lactose intolerant
100% plant source and processing time cut down significantly.
7 months shelf life.
The Smart Way to Balance your Cholesterol

Coronary Heart Disease is the Number One killer in Malaysia, and Total blood cholesterol is the most common cholesterol measurement for CHD but it is not the most important.

The bad measurement is LDL (low density lipoprotein-cholesterol) level. HDL (high density lipoprotein-cholesterol) level and the LDL/HDL ratio.

High level of LDL (bad cholesterol) causes narrowing or blockage of blood vessels in the heart. On the contrary, HDL (good cholesterol) reduces risk of heart disease.

A good ratio of HDL/LDL cholesterol is the key to reducing the risk of heart disease. Now you can achieve this by combining Smart Balance with a healthy diet.

Smart Balance is a great tasting cooking oil:

- It has US Patents (5,578,334 & 5,843,497) to help improve cholesterol ratio in your blood
- It helps to increase the beneficial HDL cholesterol
- It helps to reduce the risk of coronary heart disease and coronary artery disease
- It contains Vitamin E (Tocopherols & Tocopherols)
- Free from harmful Trans-Fatty Acids
- Now, with an improved and better blend of Soya, Palm Fruit and Canola Oil

Smart Balance is a great tasting cooking oil with more health benefits and the only oil with US Patents (5,578,334 & 5,843,497) to improve Cholesterol Ratio.
Palm Based Emulsifier

- Salad dressing
- Mayonnaise
- Homogenized Milk
- Vinaigrette
Stabilizer in Peanut Butter Spread

Ingredients: Peanuts, evaporated cane juice, palm fruit oil, Corn Syrup

Nutrition Facts

- Total Fat: 15g (23% DV)
- Total Carb: 8g (3% DV)
- Cholesterol: 0mg (0% DV)
- Sodium: 100mg (4% DV)

Peanut Butter & Co. is a cozy little sandwich shop in New York City. Try our peanut butter on sandwiches, fruit, or straight from the jar. However you like it best, we know you'll be back for more.

- LEE ZALBEN, THE PEANUT BUTTER GUY

For more information about Peanut Butter & Co. or to order by mail, please visit us online www.ilovepeanutbutter.com or call 1-866-ILOVEPB.
Filled Milk
Palm Based Coffee Creamers
Summary

• Unique – different from other fats
• Natural and free of trans fat
• Rich in phytonutrients
• Versatile for food application
• Competitively priced
• Available all year round