DEVELOPMENT OF INDONESIAN FOOD INGREDIENTS INDUSTRY
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Indonesian Association of Food Technologists (IAFT)

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Foods ingredients technology has advanced tremendously in response to growing and changing demand of global consumers. Not only that consumers have high expectations for safer and more affordable foods; but they also demand more on functionality, performance, convenience and, of course, superior taste. Especially; demand for developing foods for health promotion and disease prevention are critical keys for ingredient technology. This presentation will discuss several development of food ingredients industry in Indonesia; relevant to the general trend of global consumer’s in international markets. Emerging ingredients, especially functional endogenous ingredients for health will be discussed.

*) Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center, (director) and Professor at the Department of Food Science and Technology, Faculty of Agricultural Engineering and Technology, Bogor Agricultural University, INDONESIA
GENERAL TRENDS

Consumers expectations for functional foods: functionality, convenience, performance and, of course, superior taste

- More information
- More evidence for claim
- More control over “food plus”, “food minus”, and “natural alternative”

Foods that function

- Protection against...
- Heart Disease
- Cancer
- ↑Cognitive Function
- ↑Digestion
- ↑Bone Strength

- More individual (portion control)
- More control over time and quality of preparation

- More fun & entertaining
- More ethnic & exotic taste
- More premium & indulgence

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Consumers expectations for functional foods: functionality, convenience, performance and, of course, superior taste

Convinent Foods:
- Fast and Simple
- “Take Out”
- Healthy
- Frozen Foods
- Restaurants
- Healthcare

Foods that perform:
-> Super foods?
- Foods with health benefits
- 2 for 1
- Omega-3 Fatty Acids
- Antioxidants
- Probiotics
THE NEED OF FUNCTIONAL INGREDIENTS

How to deliver product to meet consumers expectations:

- functionality, convenience, performance and, of course, superior taste

THE NEED OF FUNCTIONAL INGREDIENTS

- Ingredients for joint health
- Ingredients for performance (sport)
- Ingredients for bone health
- Ingredients for diabetes
- Ingredients for weight management
- Etc

Phytochemicals

- Ingredients for cardiovascular health
- Ingredients for digestive health
- Ingredients for eye health
THE NEED OF FUNCTIONAL INGREDIENTS

Phytochemicals

Indonesia, and Southeast Asian in general, with its (mega) biodiversity nature of the resources, has a great potential to develop phytochemicals-based functional ingredients.

Source: Sloan Trends, Inc. 2009

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Tocotrienols

Eight Isomers of Vitamin E

1. Tocotrienols function as powerful antioxidants, and in certain systems there is evidence that tocotrienols may even possess greater antioxidant activity compared with tocopherols.
Potential local resource:

- Tocotrienols comprise one half of the vitamin E family that includes the better-known tocopherols, and can be found in various foods, most prominently in rice bran and palm oil.

**Vitamin E content in Fats & Oils**

- Tocopherols
- Tocotrienols

**THE NEED OF FUNCTIONAL INGREDIENTS**

1. Tocotrienols

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# THE NEED OF FUNCTIONAL INGREDIENTS

## Carotenoids

Carotenoids are important functional ingredients due to their various health benefits. They enhance immunity and protect against toxins, colds, flu, and infections. They also prevent skin disorders and are used as an oral sun protectant. Carotenoids are responsible for reducing the harmful effects of free radicals.

### Materials

<table>
<thead>
<tr>
<th>Material</th>
<th>μg RE/100 g EP</th>
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</thead>
<tbody>
<tr>
<td>Oranges</td>
<td>21</td>
</tr>
<tr>
<td>Bananas</td>
<td>50</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>130</td>
</tr>
<tr>
<td>Carrots</td>
<td>400</td>
</tr>
<tr>
<td>CPO</td>
<td>6000-7000</td>
</tr>
<tr>
<td>Red Fruit (Pandanus conoides)</td>
<td>99000 - 123000</td>
</tr>
<tr>
<td>Oil</td>
<td></td>
</tr>
</tbody>
</table>

Potential local resource: Pandanus conoides oil.

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2a Red Fruit (Pandanus conoideus) Oil?

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2a Red Fruit (Pandanus conoideus) Oil?

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development of indonesian food ingredients industry - purwiyatno hariyadi-2011
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2a Red Fruit (*Pandanus conoideus*) Oil?

<table>
<thead>
<tr>
<th>Part of Fruits</th>
<th>EXTRACTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Traditional Method (%)</td>
</tr>
<tr>
<td>Pit</td>
<td>28,25</td>
</tr>
<tr>
<td>Seed</td>
<td>47,59</td>
</tr>
<tr>
<td>Pomace</td>
<td>3,16</td>
</tr>
<tr>
<td>Oil</td>
<td>21,00</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
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</tbody>
</table>

Andarwulan, N., Palupi, N.S and Susanti (2010)
Pengembangan Metode Ekstraksi dan Karakterisasi Ekstrak Buah Merah (*Pandanus conoideus* Lam.)

<table>
<thead>
<tr>
<th>Extract</th>
<th>Total Carotene (ppm)</th>
<th>β-carotene (ppm)</th>
<th>Total tocoferol (ppm)</th>
<th>α-tocoferol (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh Fruit</td>
<td>55.000</td>
<td>9.185</td>
<td>42.009</td>
<td>3.685</td>
</tr>
</tbody>
</table>

Andarwulan, N., Palupi, N.S and Susanti (2010)
Pengembangan Metode Ekstraksi dan Karakterisasi Ekstrak Buah Merah (*Pandanus conoideus* Lam.)

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## The Need of Functional Ingredients

### 2a Red Fruit (*Pandanus conoideus*) Oil?

<table>
<thead>
<tr>
<th>Composition of Fatty Acids</th>
<th>Extracts</th>
<th>Traditional Method</th>
<th>Method 1</th>
<th>Method 2</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C10:10</td>
<td>0.01</td>
<td>0.03</td>
<td>0.03</td>
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<tr>
<td>C12:0</td>
<td>0.25</td>
<td>0.25</td>
<td>0.45</td>
<td></td>
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<tr>
<td>C14:0</td>
<td>0.14</td>
<td>0.17</td>
<td>0.28</td>
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</tr>
<tr>
<td>C15:0</td>
<td>0.20</td>
<td>0.30</td>
<td>0.50</td>
<td></td>
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<tr>
<td>C16:0</td>
<td>23.70</td>
<td>22.00</td>
<td>19.10</td>
<td></td>
</tr>
<tr>
<td>C18:0</td>
<td>0.72</td>
<td>1.80</td>
<td>3.15</td>
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<tr>
<td>C18:1</td>
<td>79.50</td>
<td>77.90</td>
<td>74.60</td>
<td></td>
</tr>
<tr>
<td>C18:2</td>
<td>4.50</td>
<td>5.80</td>
<td>9.20</td>
<td></td>
</tr>
<tr>
<td>C18:3</td>
<td>3.20</td>
<td>7.80</td>
<td>8.70</td>
<td></td>
</tr>
<tr>
<td>C20:1</td>
<td>0.16</td>
<td>0.17</td>
<td>0.81</td>
<td></td>
</tr>
</tbody>
</table>

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Pengembangan Metode Ekstraksi dan Karakterisasi Ekstrak Buah Merah  
(*Pandanus conoideus* Lam.)

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2a Red Fruit (Pandanus conoideus) Oil?

RED FRUIT OIL

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3a Ingredients from exotic produce:

Pomegranate—Latin means “apple with many seeds.”

- A natural product that is receiving increased attention for its potential role in helping to maintain cardiovascular health is the pomegranate.

- Pomegranates contain a wide array of beneficial polyphenolic compounds including anthocyanins, catechins, tannins, and ellagic and gallic acids.

Molecular Structure of Ellagic Acid
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**3b** Ingredients from exotic produce: Mangosteen

**3c** Ingredients from exotic produce: Morinda Citrifolia or Noni Fruit
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Ingredients from exotic produce:

3c Morinda Citrifolia or Noni Fruit

Ingredients from exotic produce:

3d Aloe Vera

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4. Ingredients from exotic produce: Natural Extracts

- Natural extracts are created by treating a natural raw material such as clove, cocoa, or coffee with solvent.
- The extract is concentrated by the partial or total evaporation of the solvent, which produces a specific flavor profile.

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4a. Ingredients from exotic produce: Natural Extracts – Cacao Extracts

- Indonesia is one of the world's largest producers of cacao. In 2009, the country's production of cacao beans totaled 849,875 tons.
- Indonesia exports most of its production of cacao beans as cacao processing industry has not expanded in the country.
- In March 2010, the government announced a regulation slapping export tax on cacao beans to encourage development of cacao processing industry in the country.
- The government also has announced a new policy to adopt an Indonesian National Standard (SNI) for cacao beans and powdered cacao this year.
- Cacao products include cacao beans, shell and cacao waste, cacao paste, cacao fat and cacao powder listed in the tariff codes of HS 1801.00.00.00 to HS 1505.00.00.00.
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4a 
**Ingredients from exotic produce:**

*Natural Extracts – Cacao Extracts*

**Uses**
Cocoa extract is widely used in both alcoholic and non-alcoholic beverages, frozen dairy desserts, candies, baked goods, and some other applications.

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4b 
**Ingredients from exotic produce:**

*Natural Extracts – Coffee Extracts*

**Sources**
Coffee Extract is the natural extract of roasted beans (seeds) of Coffee a species (*Rubiaceae*).
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4b Ingredients from exotic produce: 
Natural Extracts – Coffee Extracts

Uses
Coffee extract is widely used as a flavor ingredient in many food products, including alcoholic and non-alcoholic beverages, frozen dairy desserts, candy, baked goods, puddings, sweet sauces, and milk products.

4c Ingredients from exotic produce: 
Natural Extracts – Vanilla Extracts

Sources
- Vanilla is an Orchid and still one of the most expensive spices.
- Referred to as "Green Gold" & "Prince of Spices"
- The main species harvested for vanillin is Vanilla planifolia.
THE NEED OF FUNCTIONAL INGREDIENTS

Ingredients from exotic produce:
Natural Extracts – Vanilla Extracts

Uses
• Vanillin is widely used in the production of chocolates, cookies, bakery products, ice creams, perfumes, agarbathies, drugs, chewing gum and milk.
• It is also widely employed in many perfumes where its strong pleasant aroma is greatly appreciated.

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Ingredients from exotic produce:
Natural Extracts – Tea Extracts

Sources
The natural source of Green Tea is *Camellia sinensis* (*Theaceae* family), a tree that resembles an evergreen shrub, which can grow to 30 feet in height, with dark green leaves and intermittent white flowers.
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Ingredients from exotic produce:
Natural Extracts – Tea Extracts

Uses
Green tea extract is widely used in both medicine and industrial beverages. The healthful properties of green tea are largely attributed to polyphenols, an active ingredient that offers antioxidant and anti aging.

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Ingredients from exotic produce:
Natural Extracts – Tamarind Extracts

Sources
Tamarind Extract is the natural extract of the ripe fruits (pods) of *Tamarindus indica* L. (*Leguminosae*), an evergreen tree with large trunk and dark grey bark.

Uses
- Tamarind fruit is widely used in Asia as an ingredient in chutneys and curries and in pickling fish.
- It is also extensively used in making a refreshing drink. Tamarind extract is used in alcoholic and non-alcoholic beverages, frozen dairy desserts, candy, baked goods, gelatines and puddings, gravies and sauces.

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Essential Oil

Essential oils are the volatile oils obtained through distillation of the botanical parts of plants such as leaves, flowers, seeds, or bark.
- Advanced methods such as fractionation or short path (molecular) distillation are used in the redistilling process of these oils.
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6 Palm-based Specialties Fats

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**Palm-based Specialties Fats**

Fats with special properties for special purpose/applications.

**Cocoa Butter Alternatives (CBA)?**

- Fats to meet various requirements in the chocolate and cocoa confectionery industries (**CBS, CBX**, and **CBE**).
- Such specialty fats to replace cocoa butter completely or partially, specialty fats for confectionery coating, filling, molding and specialty fats for ice cream.

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**Cocoa Butter Equivalents**

**Cocoa-butter**

**Cocoa Butter Replacements**

**Cocoa Butter Substitutes**

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Soekopitojo, 2011

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6 Palm-based Specialties Fats

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Soekopitojo, 2011
AFTER THOUGHT:

Indonesia (Asia) has a great potential to play important role in the development of modern food industry:
→ Back to basic: indigenous resources

THANK YOU