FOOD INNOVATION AND RENOVATION – GOVERNMENT PERSPECTIVES AND EXPECTATIONS

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MINISTRY OF HEALTH MALAYSIA

Paper presented at the ILSI Malaysia Country Committee 8th Scientific Seminar, Renaissance Kuala Lumpur Hotel, 4 November 2014
Outline

- Introduction
- Disease Trends
- Food Consumption
- Nutrition Interventions
- Healthier Food Choices
- Consumer Awareness and Acceptance
- Way Forward
Overweight prevalence (%) in Southeast Asia for adults of both sexes (BMI of >25kg/m2)

Data drawn from WHO Non-Communicable Diseases Country Profiles, 2011

3 million out of 28 million Malaysian population diagnosed with diabetes.
Obesity in Adults, ASEAN Region, 2010
### Raised Blood Sugar in Adults, ASEAN Region, 2010

<table>
<thead>
<tr>
<th>Country</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>4.7</td>
<td>5.2</td>
</tr>
<tr>
<td>Myanmar</td>
<td>6.1</td>
<td>6.5</td>
</tr>
<tr>
<td>Philippines</td>
<td>6.6</td>
<td>6.6</td>
</tr>
<tr>
<td>Indonesia</td>
<td>7.1</td>
<td>7.1</td>
</tr>
<tr>
<td>Thailand</td>
<td>7.3</td>
<td>7.1</td>
</tr>
<tr>
<td>Singapore</td>
<td>7.1</td>
<td>7.5</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>7.9</td>
<td>7.5</td>
</tr>
<tr>
<td>Malaysia</td>
<td>11.6</td>
<td>11.1</td>
</tr>
<tr>
<td>Japan</td>
<td>7.2</td>
<td>4.7</td>
</tr>
</tbody>
</table>

*Prevalence %*
DISEASE TRENDS

- NHMS II (1996)
  - Overweight: 16.6%
  - Obesity: 4.4%

- NHMS III (2006)
  - Overweight: 29.1%
  - Obesity: 14.0%

- NHMS 2011
  - Overweight: 29.4%
  - Obesity: 15.1%

Prevalence of Abdominal Obesity, ≥18 years (2006 & 2011)

- NHMS 2006
  - Males: 47.1%
  - Females: 30.1%

- NHMS 2011
  - Males: 54.1%
  - Females: 37.1%

Prevalence of Abdominal Obesity by age groups (NHMS 2011)

Source: National Health & Morbidity Surveys (NHMS)

Prevalence of Hypertension, ≥18 years (2006 & 2011)

Prevalence of Hyper-cholesterolaemia, ≥18 years (2006 & 2011)

Source: National Health & Morbidity Surveys (NHMS)
FOOD CONSUMPTION
Source of Food for Meals

Source: The Malaysian Adult Nutrition Survey (MANS) 2003
## Comparison of Daily Food Intake with the Malaysian Dietary Guidelines 1999 (Food Pyramid)

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Food Pyramid Recommendations</th>
<th>No. of Servings / day taken</th>
<th>Achieved the recommendations?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereal, cereal products and tuber</td>
<td>8 - 12</td>
<td>9.9</td>
<td>Yes</td>
</tr>
<tr>
<td>Fruits and vegetables</td>
<td>5</td>
<td>6.34</td>
<td>Yes</td>
</tr>
<tr>
<td>Meat, poultry, fish, legumes and products</td>
<td>2-3</td>
<td>8.72</td>
<td>Excess</td>
</tr>
<tr>
<td>Milk and dairy products</td>
<td>1- 2</td>
<td>0.14</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: The Malaysian Adult Nutrition Survey (MANS) 2003
## Prevalence and Mean Frequency of the Top 10 Daily Consumed Foods

<table>
<thead>
<tr>
<th>Type of food</th>
<th>Prevalence (%)</th>
<th>Mean frequency/ day</th>
<th>Total amount consumed daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooked rice</td>
<td>97.15</td>
<td>2.00</td>
<td>2 ½ plate (294.06 gram)</td>
</tr>
<tr>
<td>Marine fish</td>
<td>40.78</td>
<td>1.61</td>
<td>1 ½ medium (100.27 gram)</td>
</tr>
<tr>
<td>Green leafy vegetables</td>
<td>39.89</td>
<td>1.47</td>
<td>1 cup (93.26 gram)</td>
</tr>
<tr>
<td>Sweetened condensed milk</td>
<td>35.55</td>
<td>1.57</td>
<td>3 teaspoons (50.93 gram)</td>
</tr>
<tr>
<td>Powdered milk</td>
<td>17.13</td>
<td>1.41</td>
<td>3 teaspoons (20.61 gram)</td>
</tr>
<tr>
<td>Bread</td>
<td>17.11</td>
<td>1.24</td>
<td>3 pieces (96.48 gram)</td>
</tr>
<tr>
<td>Biscuit</td>
<td>16.30</td>
<td>1.25</td>
<td>5 pieces (55.66 gram)</td>
</tr>
<tr>
<td>Local kuih</td>
<td>16.30</td>
<td>1.25</td>
<td>2 pieces (62.27 gram)</td>
</tr>
<tr>
<td>Chicken egg</td>
<td>12.06</td>
<td>1.15</td>
<td>1 whole medium (71.84 gram)</td>
</tr>
<tr>
<td>Anchovies</td>
<td>11.94</td>
<td>1.24</td>
<td>2 tablespoons (15.45 gram)</td>
</tr>
</tbody>
</table>
### Summary of NHMS 2011: Findings on Intake of Drinks with Sweetened Condensed Milk/ Creamer in Malaysia

<table>
<thead>
<tr>
<th>Daily intake of Intake of Drinks with Sweetened Condensed Milk/ Creamer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(0 cup per day)</td>
<td>46.8%</td>
</tr>
<tr>
<td>(1- &lt;2 cups per day)</td>
<td>24.0%</td>
</tr>
<tr>
<td>(2-&lt;3 cups per day)</td>
<td>15.4%</td>
</tr>
<tr>
<td>(≥ 3 cups per day)</td>
<td>13.7%</td>
</tr>
</tbody>
</table>
### Summary of NHMS 2011: Findings on Fruit and Vegetables Intake in Malaysia

<table>
<thead>
<tr>
<th>Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily intake of fruit at least 2 servings based on Malaysian Dietary Guidelines (≥18 years)</td>
<td>15.5%</td>
</tr>
<tr>
<td>Daily intake of vegetables at least 3 servings based on Malaysian Dietary Guidelines (≥ 18 years)</td>
<td>13.7%</td>
</tr>
<tr>
<td>Daily intake of fruits and/or vegetables ≥ 5 servings (≥18 years)</td>
<td>7.5%</td>
</tr>
<tr>
<td>Percentage of respondents taking fruit everyday (≥18 years)</td>
<td>27.7%</td>
</tr>
<tr>
<td>Percentage of respondents taking vegetables everyday (≥18 years)</td>
<td>76.0%</td>
</tr>
</tbody>
</table>
Physical Activity

Definition - “Active” Physical Activity: Combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum of at least 600 MET-minutes/week.
NUTRITION INTERVENTIONS
Nutrition Interventions Through Lifecycle Approach

- Iodine Deficiency Disorders Programme
- Nutrition through media
- Dialogue with food industries
- Supportive environmental policies (e.g., ban sale of unhealthy foods outside school parameters)
- Nutrition Counselling
- Nutrition for Special Needs

- Healthy menus during meeting
- Healthy Cafeterias
- Healthy Catering
- Healthy Shopping at Supermarkets

Nutrition in institutions

Iron folate supplementation Programme

Antenatal & postnatal mothers

Infants & young children

Elderly

Adults

Teenage

School children

Lifecyle Approach

Healthy Eating at National Service Training Camps

Creche at workplace
Menus at Daycare Centres

- Growth Monitoring
- Breastfeeding
- Complementary Feeding
- Food Basket Programme
- Community Feeding
- Baby Friendly Hospital Initiative
- Code of Ethics

- Healthy School Canteens
- Supplementary Feeding Programme
- School Milk Programme
- Health Promoting School
- Curriculum Integration
Collaboration with other agencies

a) Development of menus and recipes for childcare centres in collaboration with Ministry of Education, Malaysia.

b) Community Development Department (KEMAS)
   - Training of preschool teachers in:
     - Nutritional Status Monitoring of Preschoolers.
     - Nutritional and Food Safety Educational Activities in Preschool.

c) Social Welfare Department of Malaysia (JKM)
   - Co-development of ‘Guideline of Menu Planning in Childcare Centres’.
Nutrition Promotion for Pre-school Children

Activities

a) Healthy Eating Promotional Activities in Childcare Centres.

b) Development of Healthy Recipes.

Porridge

Sandwich

Fried Rice

Nutrition Division, MOH
Nutrition Promotion for School Children

Comics And Healthy Eating Posters For Primary School Children

Nutrition Division, MOH
Nutrition Promotion for Adults

- Recommended Nutrient Intakes for Malaysia (RNI) 2005.
- Healthy Recipes, Volume I & II.
- Nutritionists’ Choice Cookbook, Volume I & II.
Healthy Catering Training for Food Handlers

Aim

To increase knowledge and skill about healthy eating and practice of healthy and safe food preparation among food handlers in Malaysia.
Healthy Catering for Meetings

Aim

To practise healthy eating at meetings especially in government agencies.

Until June 2014, **33,780** caterers in Malaysia have been trained.
Healthy Cafeteria

Aim

To provide supportive environment for healthy eating in the community.

- Circular by The Director-General of Health Malaysia (No.25/2012, dated 16 September 2012) was issued to all the Health Facilities in Ministry of Health Malaysia on the implementation of Healthy Cafeteria in their premises.

- Until September 2014, 60 (32.1%) out of 187 cafeterias in Government Health Facilities are recognised as Healthy Cafeteria.
Aim

To increase knowledge and skill on healthier food selection and purchasing among consumers during food shopping.

Activities in the supermarket

- Dissemination of nutrition information in the supermarket through posters and shelf talkers.
- Nutrition education through supermarket tours.
Nutrition Information Centre (NIC)

Aim

- To disseminate nutrition information systematically to the various government and non-government agencies.
- There are 15 NICs throughout the country.
- Nutrition Division’s NIC is operating at Level 1, Block E3, Parcel E, Ministry of Health Malaysia, Putrajaya.

Activities

i. Anthropometry screening
ii. Weight management programme
iii. Nutrition counseling
iv. Aerobic exercises
v. Food display
vi. Distribution of education materials
Healthy Community Kitchen (HCK)

- To enhance nutritional status amongst family and community through the attractive and effective healthy eating and food safety promotion.

**Achievements**
57 Healthy Community Kitchens
Healthy Eating During Chinese New Year Booklet

- As a guidance for healthy eating during Chinese New Year celebration.

- This booklet consist of list of food usually served during Chinese New Year and their calories.

- In 2013, 12 modified healthier Chinese New Year food recipes were included in the booklet.
Healthy Eating During Festive Season – Hari Raya Aidilfitri (Eid Mubarak)

Healthy Eating During Hari Raya Aidilfitri Booklet

✦ As a guidance for healthy eating during Hari Raya Aidilfitri celebration.

✦ This booklet consist of list of food usually served during Hari Raya celebration and their calories.

✦ In 2013, modified healthier Hari Raya food recipes were included in the booklet.
Healthy Eating During Festive Season – Deepavali

Healthy Eating During The Deepavali Festival Booklet

- This booklet consist of list of food usually served during Deepavali festival and their calories.
- As a guidance for healthy eating during Deepavali.
Nutrition Promotion Through ICT

My Nutri Apps can be downloaded from ANDROID and IOS (iphone user)

Web: http://nutrition.moh.gov.my

KKM: Kementerian Kesihatan Malaysia
BP: Bahagian Pemakanan, Kementerian Kesihatan Malaysia

KKM: Kementerian Kesihatan Malaysia
BP: Bahagian Pemakanan

KKM: @KKMPutrajaya
BP: @BhgPemakananKKM

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Bahagian Pemakanan, Kementerian Kesihatan Malaysia

August 1

Berat badan unggul boleh dicapai dan dikekalkan dengan mengamalkan gaya pemakanan yang sihat dan aktif selalu!

Nikmatilah faedah-faedah baci mengamalkan berat badan unggul.

Kekalkan Berat Badan UNGGUL
Jauhi dari diabetes, tekanan darah tinggi, sakit jantung dan kanker

1. Risiko rendah untuk mendapat:
- diabetes, hipertensi, penyakit jantung, kanker, batu karang, sakit sendi.
2. Mudah melakukan pergerakan dan aktiviti fizikal.
3. Tidak cepat ponar.

26,768 people reached

Boost Post

Nutrition Division, MOH

Bahagian Pemakanan, Kementerian Kesihatan Malaysia

April 16

Tahukah Anda?
Masalah obesiti di Malaysia semakin membimbangkan. Menurut kajian yang dilaksanakan oleh Pertubuhan Kesehatan Sedunia (WHO) pada 2011, Malaysia merupakan negara yang mempunyai paling ramai penduduk yang gemuk di Asia Tenggara.

Marilah kita bersama "Makan Secara Sihat, Bergerak Aktif, Cegah Obesiti!" Ingat pencegahan lebih baik daripada mengubati.

OVERWEIGHT POPULATIONS IN SOUTHEAST ASIA
Overweight prevalence % for adults of both sexes (BMI of ≥25 kg/m²)

Cambodia | Indonesia | Laos | Malaysia | Myanmar | Philippines | Singapore | Thailand | Vietnam

27.088 people reached

Like · Comment · Share · 48 · 5 · 280
HEALTHIER FOOD CHOICES IN MALAYSIA
## HEALTHY MALAYSIANS

### DREAM

To raise awareness/share aspiration/encourage higher contribution of industry player on reducing the risk of NCDs

### GOAL

Continue to provide healthier food choices for Malaysians

Adopt an active role in multi-sectoral partnerships

Engage wider industry participation in the NCD prevention and control programs

### COMMITMENTS

- Continue to provide healthier food choices for Malaysians
- Adopt an active role in multi-sectoral partnerships
- Engage wider industry participation in the NCD prevention and control programs

### PROGRAMS

- Continue to produce and promote science-based and healthier products options in the market
- Setting up Health and Nutrition Working Group
- Educational seminar and dialogue
- 1. FOP Calorie labeling
- 2. Healthy Eating in Fast Food Restaurants
- 3. Marketing to Kids policy
- 4. Healthier Choice Logo

### PLANS

- Yearly report on number of reformulation/innovation. Continue our efforts with respect to portion control.
- Continue to use communication to help raise consumer awareness on health & wellness.
- To address NCD via Multi-Stakeholders approach, leveraging on Public-Private Partnership – MDG.
- To practise early engagement and active participation with stakeholders.
- Malaysia Pledge

### ENABLERS

- Meeting and discussions
- Working Groups
- Partnerships and engagement with other stakeholders

Source: Federation of Malaysian Manufacturers

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**Nutrition Division, MOH**
Healthy Eating In Fast Food Restaurants

- Ministry of Health defined fast food as ‘foods which are prepared in huge quantity by a standardised method and can be served quickly at outlets called fast food restaurants which normally advertise their services through electronic and print media’.

- Accessibility to fast food and carbonated drinks is a major challenge to a healthy diet. It is positively associated with higher caloric intake, higher BMI, weight gain, and low nutrition.

- The scientific literature suggests three main reasons why fast food likely contributes to obesity: large, inexpensive portion sizes; high energy density; and the frequency with which Americans, including children, consume it. (See Brownell KD. Fast food and obesity in children. Pediatrics 2004;113(1 Pt 1):132)
<table>
<thead>
<tr>
<th>Company</th>
<th>Number of restaurant</th>
</tr>
</thead>
<tbody>
<tr>
<td>McDonald</td>
<td>73</td>
</tr>
<tr>
<td>KFC</td>
<td>131</td>
</tr>
<tr>
<td>Pizza Hut</td>
<td>80</td>
</tr>
<tr>
<td>KRR*</td>
<td>26</td>
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</tbody>
</table>

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<thead>
<tr>
<th>Company</th>
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<tr>
<td>McDonald</td>
<td>10</td>
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<td>KFC</td>
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<tr>
<td>Pizza Hut</td>
<td>13</td>
</tr>
<tr>
<td>KRR*</td>
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<thead>
<tr>
<th>Company</th>
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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>KFC</td>
<td>21</td>
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<tr>
<td>Pizza Hut</td>
<td>14</td>
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<td>McDonald</td>
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<td>KFC</td>
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<tr>
<td>Pizza Hut</td>
<td>19</td>
</tr>
<tr>
<td>KRR*</td>
<td>4</td>
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</tbody>
</table>

Source:
- [http://202.75.40.55/resta urant_locator/listing.aspx](http://202.75.40.55/resta urant_locator/listing.aspx)

*KRR: Kenny Rogers Roasters*
**How Much Nutritional Content in One Fast Food Meal?**

<table>
<thead>
<tr>
<th>Nutritional Value (per serving)</th>
<th>Content (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (kcal)</td>
<td>684</td>
</tr>
<tr>
<td>Carbohydrates (g)</td>
<td>30</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>76</td>
</tr>
<tr>
<td>Fat (g)</td>
<td>30</td>
</tr>
<tr>
<td>Salt (g)</td>
<td>2.38</td>
</tr>
</tbody>
</table>

**Nutritional Value (per serving = 2 pcs)**

<table>
<thead>
<tr>
<th>Nutritional Value (per serving)</th>
<th>Content (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (kcal)</td>
<td>60</td>
</tr>
<tr>
<td>Carbohydrates (g)</td>
<td>13</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>2</td>
</tr>
<tr>
<td>Fat (g)</td>
<td>0</td>
</tr>
<tr>
<td>Salt (g)</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**Total Nutritional Content**

<table>
<thead>
<tr>
<th>Nutritional Value</th>
<th>Content (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (kcal)</td>
<td>1038</td>
</tr>
<tr>
<td>Carbohydrates (g)</td>
<td>76</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>84</td>
</tr>
<tr>
<td>Fat (g)</td>
<td>45</td>
</tr>
<tr>
<td>Sugar (g)</td>
<td>11</td>
</tr>
<tr>
<td>Salt (g)</td>
<td>3.43</td>
</tr>
</tbody>
</table>

**Recommendation**

Daily Calorie Intake for adult is **2000 kcal**
Recommendation of Healthy Eating in Fast Food Restaurants

- To assist consumers in making healthier choice at fast food restaurants.
- To encourage and promote good practices amongst fast food industries in producing healthier products.
- To improve long term dietary practices of Malaysians hence, reducing the prevalence of diet-related non-communicable diseases.
Recommendation 1: Reduce portion size

- Triple Cheeseburger: 520 kcal
- Double Cheeseburger: 455 kcal
- Cheeseburger: 307 kcal
- Large (213 kcal)
- Small (116 kcal)
- Large (413 kcal)
- Small (224 kcal)
Recommendation 2: Introduce Healthier Options

- Healthier food choices
  - Less salt
  - Less sugar
  - More fibre
  - Less sauce or only upon request
  - Add more fruits or vegetables or salad in the meal
  - Prepare plain water
  - Make wholemeal bread available
Recommendation 3: Introduce Smaller Meals

Promote smaller meals to kids and adults

Recommendation 4: Nutrition Labelling & Education

Label foods with calories and nutrient content.
Conduct promotional activities to encourage consumers to read labels.
## Proposed Plan of Implementation and Achievements for Healthy Eating Promotion in Fast Food Restaurants

<table>
<thead>
<tr>
<th>ACTIVITES</th>
<th>ACHIEVEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meeting with fast food industries to promote healthy eating.</td>
<td>Meeting conducted on 28 March 2014.</td>
</tr>
<tr>
<td>Preparation and presentation on proposal paper by the fast food industries.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Fast Food Restaurants</strong></td>
</tr>
<tr>
<td>Kentucky Fried Chicken</td>
<td>5 August 2014</td>
</tr>
<tr>
<td>Kenny Rogers Rosters</td>
<td>26 August 2014</td>
</tr>
<tr>
<td>Ayamas</td>
<td>26 August 2014</td>
</tr>
<tr>
<td>Pizza Hut Malaysia</td>
<td>26 August 2014</td>
</tr>
<tr>
<td>Domino’s Malaysia</td>
<td>27 August 2014</td>
</tr>
<tr>
<td>Texas Chicken</td>
<td>10 November 2014</td>
</tr>
<tr>
<td>Implementation of the proposal by the fast food industries in phases.</td>
<td>Plan of Actions presented.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring and evaluation by 2015</td>
<td>Meeting with each fast food restaurant will be conducted annually. Monitoring and evaluation will be based on:</td>
</tr>
<tr>
<td></td>
<td>- Number of healthier products or menu sets formulated or reformulated.</td>
</tr>
<tr>
<td></td>
<td>- Number of promotional activities on nutrition labelling.</td>
</tr>
</tbody>
</table>
Collaboration with Food Industry (Product reformulation)

- **Low Fat**
- **Less Sodium**
- **Less sugar**
- **More fibre**

**a) Product reformulation from January 2013 - September 2014**

<table>
<thead>
<tr>
<th>Fat</th>
<th>Sugar</th>
<th>Sodium</th>
<th>Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>87</td>
<td>67</td>
<td>23</td>
</tr>
</tbody>
</table>

**b) Increase of fibre or additional function from January 2013 - September 2014**

<table>
<thead>
<tr>
<th>Fibre</th>
<th>Additional Function Ingredients</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>15</td>
<td>1</td>
</tr>
</tbody>
</table>
Healthier Choice Logo (HCL)

To help consumers to quickly identify healthier products within the same food category.

To assist consumers in making informed food choices through recognition of the logo displayed on the food label.

To encourage and promote good practices amongst food industries in producing healthier choice products.

To encourage the food industry to formulate food products in line with the Malaysian Dietary Guideline.

To improve long term good dietary practices of Malaysians, hence, reducing the prevalence of diet-related non-communicable diseases.

To influence food policy and legislation to ensure support for improvements in population health.
Implementation of Healthier Choice Logo (HCL) by Other Countries

- Mexico using “OK” label
  ![OK Logo](image)

- United Kingdom using Traffic Light System
  ![Traffic Light System](image)

- Singapore using Healthier Choice Symbol
  ![Healthier Choice Symbol](image)

- Australia, New Zealand, Argentina dan Kanada using ‘tick’
  ![Heart Foundation](image)
Launch on 2 April 2012.
- FOP labeling for energy button.
- Using 2000 kcal as cut-off point.
- Currently, 172 products with FOP energy button.
Companies that have implemented FOP Labelling

- Coca-cola
- Dutch Lady Milk Industries Berhad
- Gardenia
- Nestle Manufacturing (M) Sdn Bhd
- Unilever (M) Holdings
- Mondelez Malaysia Sales Sdn Bhd
- PepsiCo (Malaysia) Sdn Bhd
- Mamee Double Decker (M) Sdn Bhd
- Kellogg Asia Marketing Inc
Food Innovation: Crops For The Future Research Centre

- Biotechnology and Crop Genetics
- Breeding and Agronomy
- Agrometeorology and Ecophysiology
- Nutrition and Bioproducts
- Social, Economic and Policy

Research Value Chain

Source: Crops for the Future Research Center
Potential of underutilised crops as food ingredients......

Kundang
- 331µg Carotenes
- 0.6g Protein
- 1.4g Fibre
- 20µg Vitamin C
- 0.03µg Vitamin B1
- 0.03µg Vitamin B2

Belimbing Buluh
- 229µg Carotenes
- 80mg Potassium
- 0.7g Protein
- 0.7g Fibre
- 12mg Calcium
- 15.7µg Vitamin C

Kedondong
- 145µg Carotenes
- 0.7g Protein
- 2.3g Fibre
- 22µg Vitamin C
- 0.05µg Vitamin B1
- 0.18µg Vitamin B2

Ciku
- 130µg Carotenes
- 0.4g Protein
- 0.9g Fibre
- 6.5µg Vitamin C
- 0.06µg Vitamin B2

Source: Crops for the Future Research Center
Reorganised the cropping system: With FAMA

Breeding: For shorter maturity period

Current scattered UUC cropping system:

Rural Cool room for temporary storage: interim cool chamber (M Res)

Cool/cold room (10-15°C)

Smoothie: (Post-Doc)

Pickle, juices and cereal in case of surplus crop

Cool chain and Shelf Life Management: (M Res)

Baseline data as a precursor for further study in Nutrigenomics

Nutrient tracking along the supply chain (NPA): (PhD)

School Project

Pre-commercialisation

Commercialisation

Vertical Integration of Smoothie with further studies under RVC Concept

Source: Crops for the Future Research Center

Nutrition Division, MOH
Consumer Awareness And Acceptance

- **Heathier Choice Logo** - From a consumer perspective, it can potentially reduce consumers’ cognitive effort and time needed to process information, hence, facilitates decision making with regards to healthier choices.

- **Front-Of-Pack Labelling** - Interpretive and easy to understand. However, more healthy eating promotion is required to create awareness and educate consumers on reading and understanding labels.
Way Forward

- To actively encourage and support food innovation and renovation through public-private partner engagement.
- To further educate and empower consumers on healthy eating.
- To better utilise underutilised crops to improve nutritional security.
- To co-design, co-produce and co-implement nutrition strategies and activities for an improved nutrition landscape in Malaysia.
THANK YOU

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