Food Innovation & Renovation: Success stories and key challenges

Presented by:
FEDERATION OF MALAYSIAN MANUFACTURERS
MALAYSIAN FOOD MANUFACTURING GROUP
(FMM MAFMAG)
Outline

- Introduction of FMM
- Our commitments
- Contributions up-to-date
- Key challenges
- Summary & moving forward
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• Introduction of FMM
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• Key challenges
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FMM Brief Background

FMM
(FEDERATION OF MALAYSIAN MANUFACTURERS)
• Established on 2nd July, 1968
• Companies from many Industry Sectors
• Membership categories:
  Ordinary, Affiliate, Association

FMM MAFMAG
(MALAYSIAN FOOD MANUFACTURING GROUP)
• Established on 24th September, 1984
• Membership:
  Manufacturers and affiliates in the Food and Beverage Industry
• 69 companies to date

FMM MAFMAG Objectives
• Cohesive group to promote co-operation among food industries;
• Promote development of food industries by formulating recommendations on investment incentives, market protection and other measures;
• Channel of communication between food industries and government on relevant matters; and
• Active participation in ASEAN and international activities e.g. ASEAN-ICC, Codex Committees.
By Industry Sector

- Food, Beverage and Tobacco
- Chemicals, including Petroleum
- Electrical and Electronics
- Fabricated Metal
- Machinery
- Plastic
- Transport
- Basic Metal
- Paper, Printing and Publishing
- Non-Metallic Mineral
- Rubber
- Others
- Medical, Precision and Optical Instruments
- Textile, Wearing Apparel and Leather
- Manufacture of Furniture
- Wood and Wood Products, including Furniture
- Recycling
Economic contributions of FMM MAFMAG members in 2013 statistics:

- Annual sales turnover of FMM MAFMAG members of more than USD3.3 billion accounted for nearly 2% of the total sales value of the entire manufacturing sector in Malaysia and 58.4% of the gross exports of food products in 2013, which amounted to USD5.7 billion.

- Employment of the Group at 25,000 employees accounted for 2% of total employment in the manufacturing sector i.e. 1,035,136 persons.
Introduction of FMM MAFMAG
Health & Nutrition Working Group

Objectives:

- Active participation among the food industries in promoting health and nutrition related matters.
- Channel of communication between food industries and government and relevant stakeholders on nutrition and health related matters; and
- Commitments among the food industries to government in actively promoting and contributing on health and nutrition matters.

• Established in September, 2011
• Membership: Manufacturers and affiliates in the Food and Beverage Industry
• Working committee: 18 working committees to date
Introduction of FMM MAFMAG
Health & Nutrition Working Group
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As responsible food companies in Malaysia, FMM MAFMAG pledges to contribute actively in the implementation of NSP-NCD
Our Commitments

1. Continue to increase the production and promotion of Healthier Food Choices to Malaysians.

2. Adopt an active role in the Multi-Sectoral Partnerships.

3. Engage wider industry participation in the NCD prevention and control programs.
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Survey among selected industries:
Total accumulated number of products with reduction of fat, sugar and sodium

Total accumulated number of products with reduction on respective ingredients in selected industries (2012-2014)

NOTE:
The data is based on the survey conducted FMM MAFMAG.
2012: 14 companies
2013: 9 companies
2014: 5 companies
Reduction in Fat

- Fat reduction 7%
- Fat reduction 20.5%
- Fat reduction 17.7%
- 45% fat reduced from fresh coconut milk
- 95% fat reduced compared to classic
- 33% fat reduced compared to classic
- 50% fat reduced compared to classic
- 30% fat reduced compared to classic
Reduction in Fat

26% fat reduction
36% fat reduction
Reduction in Sugar

- 100% added sugar removal
- 5% less sugar reduction
- Less sweet with increased protein
- 50% sugar reduction
- Diet Coke
- 5% less sugar reduction
Reduction in Sugar

- 25% Sugar reduction
- 31% Sugar Reduction
- 37% Sugar reduction
Reduction in Sugar

100% Juice

Gatorade

Mid Calorie Beverages

7 Up Revive
Original

7 Up Revive
Lime Burst

7 Up Revive
Apple Zest

No Sugar / No Calorie Beverages

Pepsi Light
Reduction in Sodium

- ** Chips More **
  - Low Sodium and 30% reduced Fat

- ** Lady's Choice **
  - 28% sodium reduction
  - 20% sodium reduction

- ** Jacob's **
  - Low Sodium Hi-Fibre

- ** Ayam Brand **
  - No salt added

- ** Lady's Choice **
  - No sodium added

- ** Lady's Choice **
  - 28% sodium reduction

- ** Tartar **
  - 20% sodium reduction
Survey among selected industries: Total accumulated number of products with addition of functional ingredients

Total accumulated number of products with addition of functional ingredients in selected industries (2012-2014)

NOTE:
The data is based on the survey conducted FMM MAFMAG.
2012: 14 companies
2013: 9 companies
2014: 5 companies
Addition of functional ingredients

Addition of FOS-Inulin

Addition of Plant Sterol

Addition of Fibre

Addition of Omega-3
Addition of functional ingredients

**Nutrifruit Biscuit**

With goodness of milk, strawberry and banana fruit pieces – It took 3 years of R&D work, consumer insights, etc.
Provides consumers with a variety of great–tasting products for different meal occasions – all made with the wholesome goodness of oats!
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Key challenges

1. Consumer acceptance

2. Wider group participation

3. Innovation & technological limitation

4. Regulation
Key challenges

1. Consumer acceptance

2. Wider group participation

3. Innovation & technological limitation

4. Regulation
Key challenge: Consumer acceptance

I don’t have high blood pressure, so no need to worry about salt

The doctor put me on a low sodium diet – it tasted horrible!
Key challenge: Consumer acceptance

- Taste
- Nutrition
- Convenient
- Relevancy
- Source (natural, food safety)
- Other factors i.e. Price

Food choice
Key challenge: Consumer acceptance

- **Focus group (FG) on pasta sauce**: to evaluate product acceptance by local Malaysian consumers.
- **Result from FG**: Tomato sauce that with high salt and sugar content is the most preferred option by consumers.

<table>
<thead>
<tr>
<th>Products</th>
<th>Ranking in focus group (preference)</th>
<th>Sugar – NIP per 100g</th>
<th>Sodium – NIP per 100g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomato sauce A</td>
<td>1</td>
<td>4g</td>
<td>520mg</td>
</tr>
<tr>
<td>Tomato sauce B</td>
<td>2</td>
<td>5.2g</td>
<td>570mg</td>
</tr>
<tr>
<td>Tomato sauce C</td>
<td>3</td>
<td>5.72g</td>
<td>524mg</td>
</tr>
<tr>
<td>Tomato sauce D</td>
<td>4</td>
<td>3.6g</td>
<td>359mg</td>
</tr>
<tr>
<td>Tomato sauce E</td>
<td>5</td>
<td>4.2g</td>
<td>180mg</td>
</tr>
</tbody>
</table>
Key challenges

1. Consumer acceptance

2. Wider group participation

3. Innovation & technological limitation

4. Regulation
Key challenge: Wider group participation

Multi-sectorial partnership

Out of home: restaurant/cafe
SME/local small food producers
Health authorities
Media agency
HCP
Consumers
Retailers
Others
Key challenges

1. Consumer acceptance

2. Wider group participation

3. Innovation & technological limitation

4. Regulation
Key challenge: Innovation & Technological Limitation

- Reduction in:
  - Sugar
  - Sodium
  - Fat

- Additional functional ingredients
Key challenge:
Innovation & Technological Limitation

• Reduction in:
  – Sugar
  – Sodium
  – Fat

• Additional functional ingredients
The functional roles of sugars in foods

- Sugars have many roles in food products, beyond its sweetening properties.

- The various methods of use of sugar are based on its physical and chemical properties.

- Based on the broad range of characteristics of sugars, technical constraint is one of the challenges that food industries face in food innovation/renovation of sugar reduction or replacement of other sweetening substances.
The functional roles of sugars in processed foods

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweeteners</td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td></td>
</tr>
<tr>
<td>Texture</td>
<td></td>
</tr>
<tr>
<td>Shelf life</td>
<td></td>
</tr>
<tr>
<td>Fermentation</td>
<td></td>
</tr>
<tr>
<td>Appearance/colour</td>
<td></td>
</tr>
<tr>
<td>Preservation</td>
<td></td>
</tr>
<tr>
<td>Reduction of freezing point</td>
<td></td>
</tr>
</tbody>
</table>
# The functional roles of sugars in processed foods

<table>
<thead>
<tr>
<th>Functions</th>
<th>Cereals</th>
<th>Beverages</th>
<th>Baked Goods</th>
<th>Cakes, Cookies</th>
<th>Jams, Jellies</th>
<th>Processed Foods</th>
<th>Confections</th>
<th>Dairy</th>
<th>Frozen Desserts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweetener</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Texturizer</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Preservative</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shelf Life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Fermentation</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Caramelization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Maillard Reaction</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Solubility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Freezing Point</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>
Key challenges in sugar reduction

- Consumer acceptance – taste profile, texture/body and mouth feel
- Shorten product shelf life
- Reduction of freezing point (ice cream) – stability of products
Challenge of sugar reduction in ice cream

- **Less Sugar**
  - harder
  - less sweet

- **Less Fat**
  - less smooth
  - less creamy
  - more icy/cold
  - less stable
Sugar reduction in baked bean products

- Currently baked bean light version contributes 12.8% of the total sale for baked beans.
- It increased the competitiveness as Ayam Brand is offering 3 variances (classic, cheese and light) of baked bean products. It offered more choices for consumers, hence lead to increase frequency of consumption.
Remove added sugars in milk product

Overcame food technological challenge

Made healthier option available: Created demand for consumers

Consumer awareness and acceptance
Key challenge:
Innovation & Technological Limitation

- Reduction in:
  - Sugar
  - Sodium
  - Fat
- Additional functional ingredients
The functional roles of sodium in processed foods

- Historically, the main reason for the addition of salt to food was for preservation.

- Because of the emergence of refrigeration, advances in food storage, improvement in packaging techniques, the speed of transportation and other methods of food preservation, the need for salt as a preservative has decreased.

- However, sodium levels, especially in processed foods, still considerable high. This is due to sodium does remain important in production of processed foods because it plays additional functional roles, which is beyond its preservative effect.
The functional roles of sodium in processed foods

- Preservative
- Flavour enhancer
- Texture enhancer
- Binding agent
- Colour enhancer

Functional roles of sodium
The functional roles of sodium in processed foods

<table>
<thead>
<tr>
<th>Compound Name</th>
<th>Food to Which the Compound Is Added</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disodium ethylenediaminetetraacetic acid (EDTA)</td>
<td>Salad dressing, mayonnaise, canned seafood, fruit fillings</td>
</tr>
<tr>
<td>Sodium acetate</td>
<td>Baked goods, seafood</td>
</tr>
<tr>
<td>Sodium ascorbate</td>
<td>Meat products</td>
</tr>
<tr>
<td><strong>Sodium benzoate</strong></td>
<td>Beverages, fermented vegetables, jams, fruit fillings, salad dressings</td>
</tr>
<tr>
<td>Sodium diacetate</td>
<td>Condiments</td>
</tr>
<tr>
<td>Sodium erythorbate</td>
<td>Meat, soft drinks</td>
</tr>
<tr>
<td>Sodium lactate</td>
<td>Meat products</td>
</tr>
<tr>
<td>Sodium nitrate</td>
<td>Cured meats</td>
</tr>
<tr>
<td>Sodium phosphates</td>
<td>Meat products, cheese, puddings or custards</td>
</tr>
<tr>
<td>Sodium propionate</td>
<td>Cheese, baked goods</td>
</tr>
<tr>
<td>Sodium sulfite</td>
<td>Fruit and vegetable products, seafood</td>
</tr>
</tbody>
</table>
Key challenges in sodium reduction

• Taste profile
  – Need to shape and cultivate healthier eating habits and adopt to less salty food

• Products’ shelf life
  – Could be challenging for imported processed foods i.e. processed cheese

• Food safety
  – Reductions in salt might result in greater risk of toxin formation by Clostridium botulinum (the organism responsible for botulism) in certain foods.
  – Processed cheese and meat products have been recognized as having potential for C. botulinum control problems when sodium is reduced.
  – Microbiology activity need to be re-assessed.
Challenge of sodium reduction in dressings
Sodium reduction in ingredient

Monosodium Glutamate
(Umami Seasoning)

• Although Monosodium Glutamate (MSG) contains some sodium, research has shown that one can reduce total sodium in food as much as 30% by adding relatively small amount of MSG to reduce total salt consumption.
• How this works: MSG is a powerful bitter taste inhibitor (as is salt itself). MSG also adds body, intensity and savoury flavour to foods in a way that is somewhat similar to salt.

MSG has less sodium per gram than Table Salt
– it contains only 1/3 the amount of sodium in table salt

<table>
<thead>
<tr>
<th></th>
<th>MSG</th>
<th>Table Salt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Structure</td>
<td>Na Glutamate-H₂O</td>
<td>NaCl</td>
</tr>
<tr>
<td>Na Content (w/w)</td>
<td>12%</td>
<td>40%</td>
</tr>
</tbody>
</table>
Sodium reduction in ingredient

MSG addition can result in equally palatable food with a 30% reduction in total sodium

These two noodle dishes are equally palatable but the one with added MSG has about 30% less total sodium content
A prominent example of an added compound involves glutamic acid (an amino acid). Combining glutamic acid with sodium creates the well-known flavoring compound monosodium glutamate, or MSG. MSG imparts a savory taste (called “umami”) as well as a salt taste to food. Some studies have shown that it is possible to maintain food palatability with a lowered overall sodium level in a food when MSG is substituted for some of the salt.
Key challenge:
Innovation & Technological Limitation

• Reduction in:
  – Sugar
  – Sodium
  – Fat

• Additional functional ingredients
The functional roles of fat in processed foods

- Texture
- Taste & flavour
- Appearance
- Emulsion
- Heat transfer
- Solubility
- Melting point

Functional roles of Fat
Key challenges in fat reduction

• Products flavour, texture and taste profile
  – Reduce the creaminess of dairy products, ice cream and mayonnaise.

• Stability & safety
  – Gross reductions of fat in products such as low-fat spreads could give rise to microbiological problems.

• Cost
  – Cost effective low fat solution is very challenging.
Challenges in fat reduction in instant noodle

Maggi Tastylite – Reduced Fat Instant Noodle

- Air-dried, non-fried instant noodle
- Less than 3g fat per serving
- However, discontinued after 4 years in the market.
- Consumer prefer the taste of normal instant noodle (which is fried noodle).
Key challenge:
Innovation & Technological Limitation

• Reduction in:
  – Sugar
  – Sodium
  – Fat

• Additional functional ingredients
Additional functional ingredients

- Plant sterol
- Whole grain, Dietary fibre (FOS-Inulin)
- Probiotic, etc

Improve the functionality of food
Key challenges in additional functional ingredients

- Products texture and taste profile
- Research development take time
- New ingredient approval and functional claim approval
  – Strong human clinical studies are required to prove on safety and efficacy of respective ingredient.
Key challenges in additional functional ingredients

- **Consumer knowledge and awareness**: Not all fiber breads are wholegrain bread – wheat germ vs wholegrain.
- **Consumer acceptance & preference**: Wholegrain bread taste different from white bread.
Key challenges in additional functional ingredients & sodium reduction

Value % Share

- Jacob cream cracker: 62%
- Jacob Hi-Fibre: 27%
- Jacob Hi-Fibre Low Sodium: 11%

Source: Modified from AC Nielsen Malaysia Retail Index
Key challenges

1. Consumer acceptance
2. Wider group participation
3. Innovation & technological limitation
4. Food regulation
Key challenge: Food regulation

1. Nutrient comparative claims:
   - **Regulation 18D:** Nutrient comparative claims: the comparison should be based on a relative difference of at least 25% in the energy or nutrient content, except for micronutrients where a 10% difference in NRV would be acceptable, between the compared foods and a minimum absolute difference in the energy value or nutrient content equal to or more than the value required for claim as ‘low’ or a ‘source’ in Table I and II to the Fifth A Schedule.
   - **Regulation 18C:** Fifth A Schedule (Table I) Conditions for nutrient contents for use of nutrition claims - Meeting the criteria of “low in” or “free of”.

- **Challenges:** Food technological challenge & consumer communication is not possible if the product is not able to meet the required criteria.
Key challenge: Food regulation

2. Approval of new ingredient to be added in food & new ingredient functional claims

3. Shared formulations across many regions
   – new innovated/renovated formulations need to be incompliance with other countries food regulations

4. Level of understanding from consumers on product labels
Key challenge: Food regulation

Based on 2000 kcal

One Serving (30g) contains

- Energy: 140 kcal
- 7.0% of

**TH**

Setiap hidangan (30g) mengandungi:

- Tenaga: 140 kcal
- 7.0% of

**MY**

Berdasarkan 2000 kcal

**PH**

Based on 2000 kcal

**ID**

Per 30 g

- Energi: 0 Kkal
- Lemak: 0 g
- Gula: 30 mg
- Natrium: 0 mg
- % Asupan Kecukupan Gizi (AKG): 0%
Key challenges: Food regulation

5. Limitations and barrier to food innovation:
   - Some current vertical regulatory standards could restrict industry in providing choices such as products that are low in fat, sodium or sugar.
   - For example:
     - Reg 95 (Condensed milk or Sweetened condensed milk) shall contain not less than 8% milk fat. This regulation may restrict industry from innovating a “low fat” condense milk product whereby it needs to meet < 3% of fat.
     - Reg 26 (7) (Table III): Twelfth schedule - Permitted added nutrient: max amount in recommended daily serving, i.e. Ascorbic acid – max level is 100mg/day
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Summary

- Food industries will continuously nurture innovation and/or renovation by offering a range of products with healthier options available for consumers that support the goal of healthier diets.
- Besides offering choices, we are committed to provide transparent, fact-based information that empower consumers to make informed product choices and usages.
- There are many challenges that industries experience especially consumer acceptance and behaviour.
- In responding to the key challenges, we believe that the most strongest and cost-effective way to address the challenges is through public-private-partnership.
Moving forward

Partnering at all levels

Continuous research development

Sharing expertise (regulatory & nutrition)

Education

Increase consumers awareness & increase demands
An innovation journey in action
Thank You