RISK ANALYSIS FOR FOOD SAFETY IN THAILAND

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Since 2003, Food Safety Policy and implementation have been campaigned in Thailand. Food Safety strategies and road map covering the food chain were developed. In 2008, Law to establish National Committee on Food was issued.

Strategy of Food Safety System (from 2003)

Regulatory measure comply with international standard  
Standardized of  
1. Imported  
2. Domestic  
3. Exported

Strengthen on  
1. Food Safety monitoring  
2. Risk management system

Improve  
1. Consumer’s potential  
2. Risk management system

Improve  
1. Resource work process  
2. Human resource

Improve  
1. Lab potential  
2. Lab capacity

Food for sale (consumer protection)  
1. Market – food test kits  
2. Restaurant – clean food good taste  
3. Street food vendor  
4. Check FDA label

Food production (farm/ factory)  
1. Control food production  
2. Control food quarantine

Transportation/Logistic  
1. Control food production  
2. Control food quarantine

Consumer

In 2008, Law to establish National Committee on Food has been issued. (National Committee on Food Act 2551)

To coordinate the activities:
1. Food quality  
2. Food safety  
3. Food security  
4. Food education

Chair by the prime minister

Food safety based on risk analysis

Risk Analysis Activity

Generic components of risk analysis

Risk Communication

Risk Assessment

Risk Management

Interactive and ongoing exchange of information and opinions

Scientific inputs

Decisions involving Policy and values
Benefits for national governments of using food safety risk analysis

- Risk Analysis allows likely costs of implementation and compliance to be compared with expected benefits.
- Supports setting research priorities of food safety problems.
- Supports food safety regulators for effective decision-making for food safety management.

Food microbiological risk assessment in Thailand

<table>
<thead>
<tr>
<th>Year</th>
<th>Host</th>
<th>Risk Assessment</th>
<th>Hazard</th>
<th>Commodity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>ACFS</td>
<td>Chemical risk Assessment</td>
<td>3- MCPD</td>
<td>Seasoning sauce</td>
</tr>
<tr>
<td>2003</td>
<td>ACFS</td>
<td>Chemical risk Assessment</td>
<td>sulfate dioxine</td>
<td>Food</td>
</tr>
<tr>
<td>2003</td>
<td>ACFS</td>
<td>Chemical risk Assessment</td>
<td>ochratoxin</td>
<td>Food</td>
</tr>
<tr>
<td>2003</td>
<td>ACFS</td>
<td>Chemical risk Assessment</td>
<td>cadmium</td>
<td>Food</td>
</tr>
<tr>
<td>2007</td>
<td>Thai FDA</td>
<td>Chemical risk Assessment</td>
<td>acrylamide</td>
<td>Food</td>
</tr>
<tr>
<td>2011</td>
<td>Thai FDA</td>
<td>Exposure Assessment</td>
<td>Sodium benzoate</td>
<td>Ready to eat food packed in plastic bag</td>
</tr>
</tbody>
</table>

Activity:

- Identification of the responsible organization for risk assessment, risk management, and risk communication
- Draw risk assessment road map and frame work
- Expert list
- Priority areas
- Capacity building

Risk Analysis Agencies

<table>
<thead>
<tr>
<th>Organization</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thai FDA</td>
<td>Risk manager, Risk communicator</td>
</tr>
<tr>
<td>ACFS</td>
<td>Risk manager, Risk communicator</td>
</tr>
<tr>
<td>DMSc</td>
<td>Risk assessor, Risk communicator</td>
</tr>
<tr>
<td>Institute of Nutrition</td>
<td>Risk assessor, Risk communicator</td>
</tr>
<tr>
<td>Knowledge Network Institute of Thailand</td>
<td>Risk assessor, Risk communicator</td>
</tr>
<tr>
<td>Some Universities</td>
<td>Risk assessor, Risk communicator</td>
</tr>
<tr>
<td>FSOC</td>
<td>Risk communicator</td>
</tr>
</tbody>
</table>

Abbreviation: FDA = Food and Drug Administration, ACFS = National Bureau of Agricultural Commodity and Food Standards, DMSc = Department of Medical Sciences, FSOC = Food Safety Operation Center
Toxicity of 3-MCPD

- A long-term study indicates that carcinogenicity of rat’s kidney relates to the quantity of exposure to 3-MCPD. However, 3-MCPD is not a genotoxic substance.

The 3-MCPD regulatory levels

<table>
<thead>
<tr>
<th>Organizations/Countries</th>
<th>2011 ppb</th>
<th>EU</th>
<th>&lt; 10 ppb</th>
<th>&lt; 20 ppb</th>
<th>Food Advisory Committee (FAC)</th>
<th>&lt; 10 ppb</th>
<th>USA</th>
<th>&lt; 1 ppm</th>
<th>Canada</th>
<th>&lt; 1 ppm</th>
<th>Australia and New Zealand</th>
<th>&lt; 20 ppb</th>
<th>Malaysia</th>
<th>&lt; 20 ppb</th>
<th>Codex and Japan</th>
<th>N/A</th>
</tr>
</thead>
</table>

Objectives

- To obtain the risk assessment data for CODEX and Thai FDA decision on the maximum level to be set as standard

- To improve and develop the efficiency of analysts in risk assessment (on-the-job training)

Areas of Study

- Hazard Identification
- Dose-response assessment
- Exposure Assessment
- Risk Characterization
Hazard Identification

- Study the properties of 3-MCPD
- Study its toxicological properties and estimate its abilities to cause toxicity in human

Dose-response assessment

- Study relations between quantity of 3-MCPD and its effect on experimental animals and human
- Study the process that cause an effect to experimental animals and human

Exposure Assessment

1. Conduct a survey of food consumption data
2. Conduct a survey of contamination of 3-MCPD in food
3. Estimate the amount of 3-MCPD that can be exposed by human

Risk Characterization

- Collect the results from exposure assessment and from estimated responding at the different quantities to estimate the risk from toxicity as well as to indicate the uncertainty

Exposure assessment result

1. General Information of households (512 households, 1,945 persons) in four regions

<table>
<thead>
<tr>
<th>Areas</th>
<th>City (person)</th>
<th>Countryside (person)</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>270</td>
<td>246</td>
<td>516</td>
<td>26.53</td>
</tr>
<tr>
<td>North</td>
<td>270</td>
<td>206</td>
<td>476</td>
<td>24.47</td>
</tr>
<tr>
<td>Northeast</td>
<td>239</td>
<td>237</td>
<td>476</td>
<td>24.47</td>
</tr>
<tr>
<td>South</td>
<td>245</td>
<td>232</td>
<td>477</td>
<td>24.53</td>
</tr>
<tr>
<td>Total</td>
<td>1,034</td>
<td>511</td>
<td>1,545</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Food consumption survey

- Household food disappearance method
- Food Frequency questionnaires
Result

• Exposure Assessment
  Thai people expose to 3-MCPD from food consumed everyday at 0.036 µg/kg bw/day in average

• Risk Characterization
  The exposure amount equals to 1.8% of PMTDI assigned by JECFA (2 µg/kg bw/day)

Conclusion

❖ The amount of 3-MCPD that Thai people expose to is in safety level.

Thanks you for yours attention