Risk Assessment: A Philippine Experience on Pesticides for Food Safety

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CODEX and RISK ANALYSIS

Risk Assessment
- hazard identification;
- hazard characterization;
- exposure assessment;
- risk characterization

Risk Management
- Identify food safety problem
- Establish risk profile
- Policy for the conduct of risk assessment
- Commissioning of risk assessment
- Eval of risk management option
- Implementation
- Monitoring and review

Risk

Communication
RISK ASSESSMENT

• One of the components of Risk Analysis
• Based on scientific evaluation from exposure to chemical /microbial hazards.
• Basis for food standards development at Codex (e.g. JMPR, JECFA, JEMRA)
RISK ASSESSMENT cont’d

Consist of:

(i) hazard identification- identifying the hazard
(ii) hazard characterization- qualitative or quantitative evaluation of the nature of the adverse effects
(iii) exposure assessment- evaluation of the degree of intake of food.
(iv) risk characterization- Integration of the above
Relation of WTO w/CODEX

- CODEX standards were identified as the key reference points in the WTO “Agreement on the Application of SPS

- As long as a country employs the CODEX standards, its measures are presumed to be in conformance with the WTO-SPS Agreement
Philippine Experience

- Risk assessment and management is implemented by both the Dept. of Agriculture (DA) for agricultural commodities and Dept. of Health (DOH) for processed foods.

- The DA and DOH, created jointly, the National CODEX Organization in 2005 to have a consultative process for establishing the country’s position for CODEX standards for risk assessment, risk management and risk communication.
Fig. 1. Philippine National CODEX Organization
e.g. **Sub Committee on Pesticide Residues**

- The Sub-committee on Pesticide Residues is responsible on pesticide issues requested by CODEX.

- Data generated by the industry are evaluated at the Fertilizer and Pesticide Authority through Expert Committees and the Technical Advisory Committee.

- Proposed MRLs are solicited and collated by the sub Committee from the authority (FPA) and comments are sent to the CCPR.
Estimation of Dietary Risk

- A dietary risk assessment is calculated based on the magnitude of residues contained in a commodity consumed on a per capita intake by an average man.

\[ \text{NTMDI} = \text{MRL}_i \times F_i \]

55 kg bw

Where:

- MRL = Maximum Residue Limit
- Fi = Nat’l. consumption of that commodity / person.
### National Theoretical Maximum Daily Intake (NTMDI)

**Pesticide Code** - 196  
**Name** - Tebufenozide  
**ADI** = 0.02 mg/kg bodyweight or 1.1 mg/person (55 kg)

<table>
<thead>
<tr>
<th>Commodity Code</th>
<th>Name</th>
<th>MRL mg/kg</th>
<th>Note</th>
<th>Diet g/day</th>
<th>NTMDI mg/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB 269</td>
<td>Grapes</td>
<td>0.5</td>
<td></td>
<td>18.00</td>
<td>0.0090</td>
</tr>
<tr>
<td>CM 649</td>
<td>Rice, Husked</td>
<td>0.1</td>
<td></td>
<td>12.00</td>
<td>0.0012</td>
</tr>
<tr>
<td>FP 9</td>
<td>Pome fruits</td>
<td>1</td>
<td></td>
<td>45.00</td>
<td>0.0450</td>
</tr>
<tr>
<td>VR 589</td>
<td>Potato</td>
<td>0.5</td>
<td>1/</td>
<td>240.00</td>
<td>0.1200</td>
</tr>
<tr>
<td>TN 678</td>
<td>Walnuts</td>
<td>0.05</td>
<td></td>
<td>1.00</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

TOTAL = 0.18  
% ADI = 16%  
(Rounded) % ADI = 20%

1/ National maximum limit
Interpretation

- When the overall exposure to a chemical is below ADI or acute RfD, the MRLs in food contributing to the exposure are unlikely to have any impact in terms of public health.

- The CODEX states that food containing residues at the level of the adopted Codex MRLs must be safe for the consumers.

- When there is exceedance of the acute RfD, the MRLs are not advanced to higher step of the Codex Procedure.
QUALITATIVE vs QUANTITATIVE

- **Qualitative risk assessment**: A risk assessment based on data which, while forming an inadequate basis for numerical risk estimations, nonetheless, when conditioned by prior expert knowledge and identification of attendant uncertainties permits risk ranking or separation into descriptive categories of risk.\(^1\)

- **Quantitative risk assessment**: A risk assessment that provides numerical expressions of risk and indication of the attendant uncertainties.

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\(^1\) Principles and Guidelines for the Conduct of Microbiological Risk Assessment (CAC/GL 30-1999)
MRL

Once MRL is recommended by the Joint FAO/WHO Meeting on Pesticide Residues or Joint Experts on Contaminants and Food Additives (CCRVDF), the Codex Committee on Pesticide Residues (CCPR) or Codex Committee on Residues of Veterinary Drugs in Foods (CCRVDF) will distribute the proposed MRLs to member countries for comments. There are eight step procedures to follow at the CAC.
When applying import requirements which are stricter than CODEX standards, guidelines and recommendations, countries ought to ensure that those measures are based on risk assessment.

If ADI is still exceeded concern about dietary intake becomes an issue for risk management to be considered by CODEX
The above procedures complement the recently signed Philippine Food Safety Act by the President on 23 Aug 2013 to strengthen the food safety regulatory system in the country. The DA and DOH set the mandatory food safety standards based on risk analysis.