



# Thailand experience on applying the acute risk assessment of pesticide residues

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Stakeholder meeting on Revisiting the International Estimate of Short-Term Intake,  
7 September 2015, Switzerland



# Outline

Part I: The establishment of Thai MRLs for  
pesticide residue

Part II: Opinion on the proposal



# National Agencies in charge of Food control

Ministry of Agriculture and Cooperatives:  
Production based

Ministry of Public Health:  
Health based

- Food production, mainly primary production (safety + quality)
- Standard of food in trade, mainly export
- Food security

- Consumer protection (safety + quality)
- Some parts of food production related to consumer protection
- Food import
- Domestic market including food service



# Food Act 1979

- Regulated by Ministry of Public Health (MOPH), Food and Drug Administration (FDA)
- Registration of food establishments
- Establish regulations on specific foods
- Control of food sold domestically or imported foods
- Control of food labelling and food advertising



# Agricultural Standards Act 2008

- Effective on 20 August 2008
- The Agricultural Standards Committee is a statutory body in charge of policy
- Enforced by the National Bureau of Agricultural Commodity and Food Standards (ACFS) , Ministry of Agriculture and Cooperative (MOAC)





# Agricultural Standards Act 2008

- Mandatory standards:
  - license required for production, export or import
  - require inspection / certification by approved CB
- Voluntary standards:
  - license not required
  - inspection / certification on voluntary basis
- The uses of certification mark for both types of standards are controlled by law



# The Establishment of Thai MRLs



มาตรฐานสินค้าเกษตร

มกช. 9002-2556

THAI AGRICULTURAL STANDARD

TAS 9002-2013

สารพิษตกค้าง : ปริมาณสารพิษตกค้างสูงสุด

PESTICIDE RESIDUES : MAXIMUM RESIDUE LIMITS

สำนักงานมาตรฐานสินค้าเกษตรและอาหารแห่งชาติ  
กระทรวงเกษตรและสหกรณ์

CS 67.040

ISBN 978-974-403-995-8



มาตรฐานสินค้าเกษตรและอาหารแห่งชาติ

มกช. 9003-2547

THAI AGRICULTURAL COMMODITY AND FOOD STANDARD

TACFS 9003-2004

สารพิษตกค้าง : ปริมาณสารพิษตกค้างสูงสุด  
ที่เป็นปื้นจากสาเหตุที่ไม่อาจหลีกเลี่ยงได้

PESTICIDE RESIDUES : EXTRANEIOUS  
MAXIMUM RESIDUE LIMITS

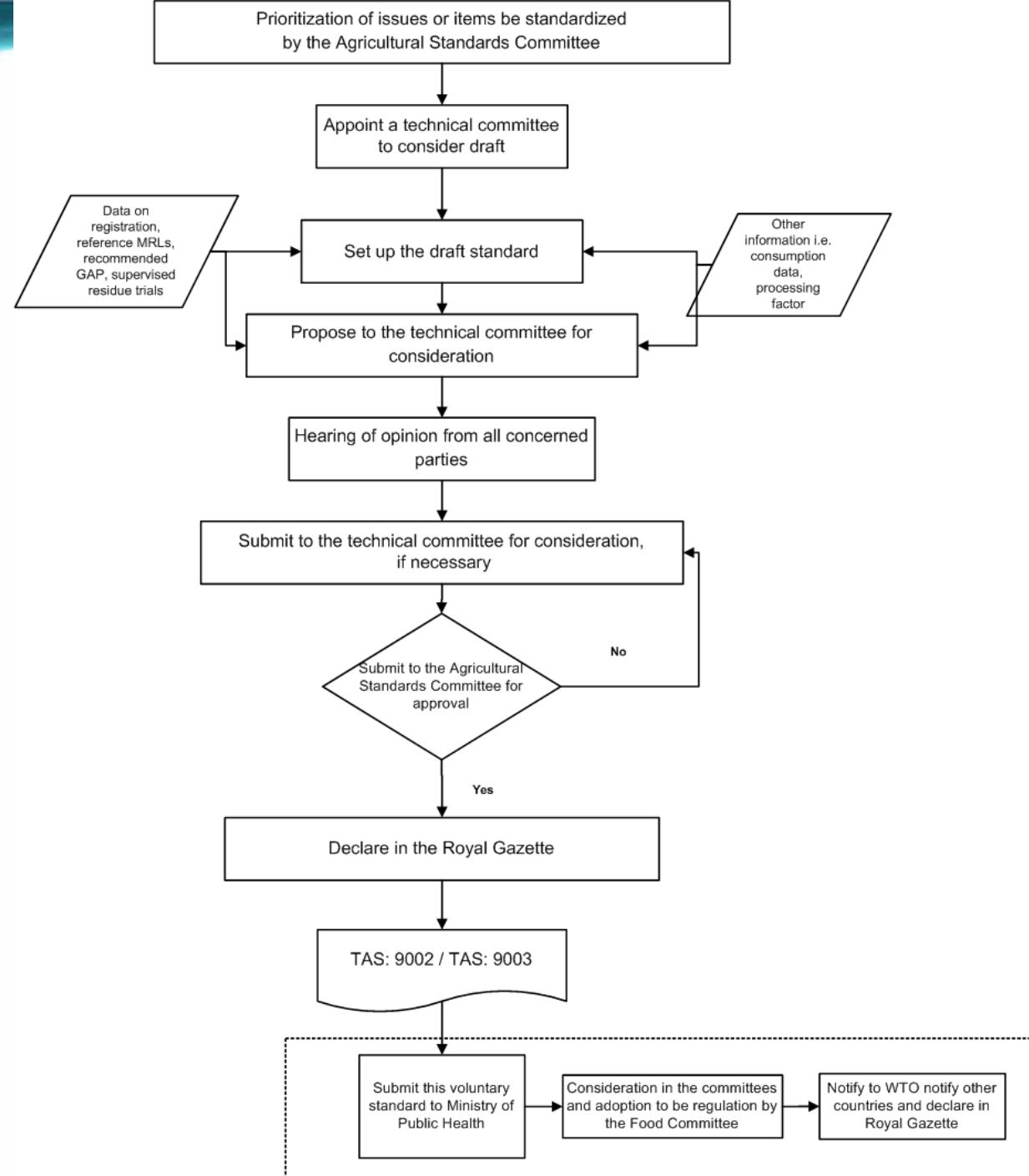
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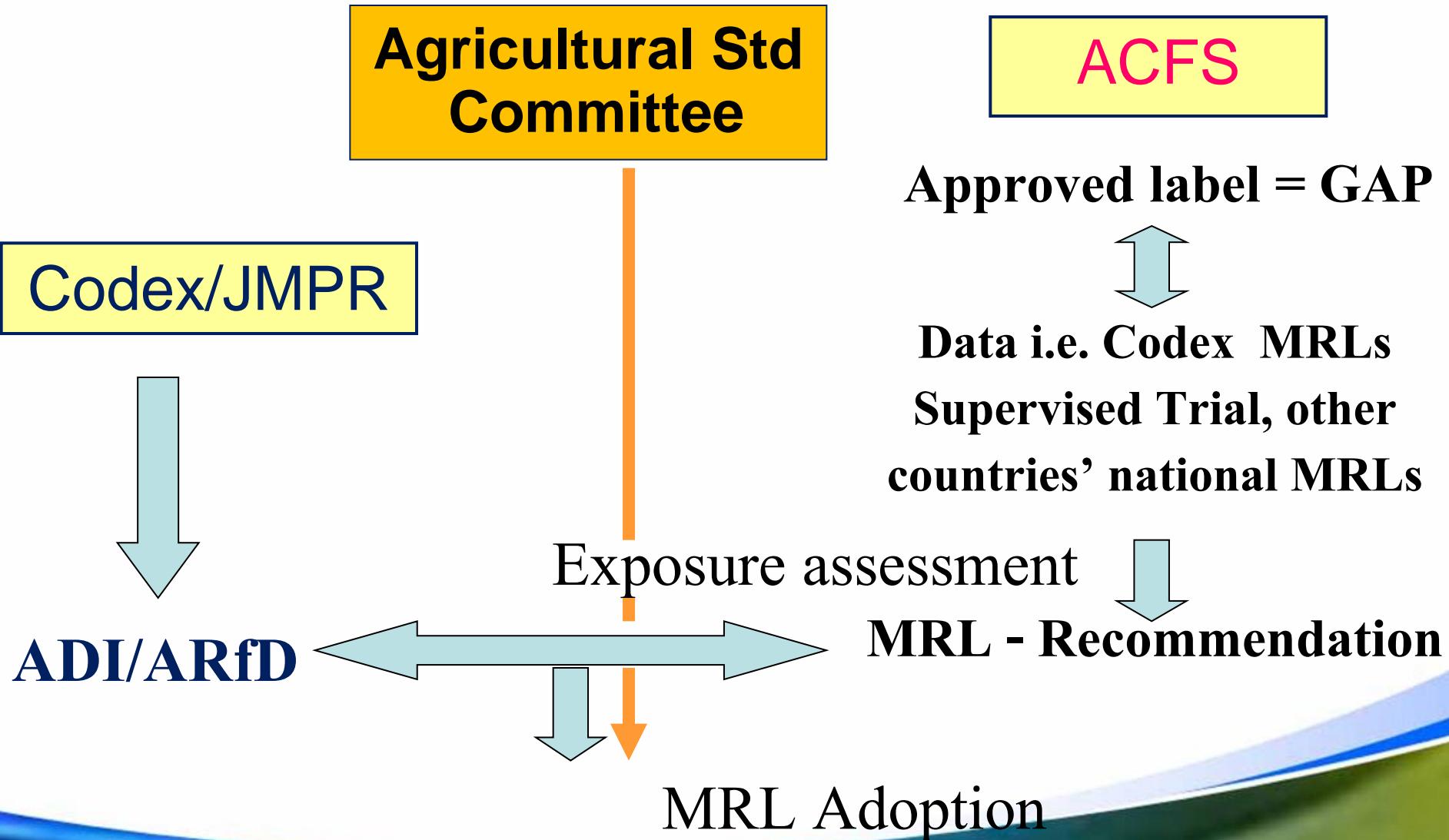


# Flow chart of the Elaboration of Thai MRLs





# Establishment of Thai MRL





# Principle/Process of MRL Establishment

- Set MRL for all commodities which the pesticide is allowed to be used
- Reference is made to Codex/ASEAN MRLs, where available
- In case of no Codex/ASEAN MRL, the following data are used :
  - Supervised residue trial data
  - Other national MRLs e.g. EU, USA, Japan, Australia
  - Other Codex/ASEAN/National MRLs on related commodities
  - Other related and available data e.g. monitoring data



# Risk Assessment of the Proposed MRLs

- ⊕ All proposed MRLs must ensure safety to consumer by apply appropriate risk assessment using Codex technique
- ⊕ Intake calculation is conducted, assuming that all food consumed contain residue at MRL (worst case)
- ⊕ Consumption data was used in the intake calculation
- ⊕ Both chronic and acute intake were included in the calculation
- ⊕ All MRLs/EMRLs have to pass the assessment that provide sufficient safety to consumer before they can be submitted for adoption as national MRLs



# Chronic Exposure Assessment

Chronic intake =

$$\Sigma \frac{\text{Food consumption} \times \text{Concentration}}{\text{Body weight}}$$

Compare intake to ADI

= Risk characterization



# Acute Exposure Assessment

= intake from one food in one meal or day

Calculate “National Estimated Short-Term Intake (NESTI)

3 cases of intake calculation depended on food commodity unit weight

Case 1 : food commodity unit weight  $\leq 25$  g

Case 2 : food commodity unit weight  $> 25$  g

Case 3 : processed Commodity is bulked or blended;  
including milk

Compare intake to ARfD = Risk characterization



# Acute Exposure Assessment

Calculate “National Estimated Short-Term Intake (NESTI)

**Case 1** - food commodity unit weight  $\leq 25$  g

- also applies to meat, edible offal, eggs

$$\text{NESTI} = \frac{\text{LP} \times \text{HR}}{\text{bw}}$$

LP = Large portion consumption (97.5th percentile of eater)

HR= Highest residue found from supervised trial data



# Acute Exposure Assessment

**Case 2** : food commodity unit weight > 25 g

**Case 2a** unit weight, edible portion (U) < LP

$$\text{NESTI} = \frac{(U \times \text{HR} \times V) + [(LP-U) \times \text{HR}]}{\text{bw}}$$

$V$  = Variability factor  
( JMPR use a default  $V = 3$  )



# Acute Exposure Assessment

Case 2b unit weight, edible portion (U)  $\geq$  LP

$$\text{NESTI} = \frac{\text{LP} \times \text{HR} \times \text{V}}{\text{bw}}$$



# Acute Exposure Assessment

**Case 3** Processed Commodity is bulked or blended; including milk

$$\text{NESTI} = \frac{\text{LP} \times \text{STMR-P}}{\text{bw}}$$

**STMR-P** = supervised trials median residue  
in processed commodity



# Tier approach

- Applied in the risk assessment for setting up national MRLs
- **1<sup>st</sup> Calculation** : Primary estimation, MRL can be used as a maximum residue concentration
  - If intake  $\leq$  ADI/ARfD  $\rightarrow$  pass
  - If intake  $>$  ADI/ARfD  $\rightarrow$  **2<sup>nd</sup> refine intake calculation**



# Refine of Intake Calculation

- **2<sup>nd</sup> Calculation** : STMR, HR, residue in edible portion, processing/cooking factors are used in this step
  - If intake  $\leq$  ADI/ARfD  $\rightarrow$  pass
  - If intake  $>$  ADI/ARfD  $\rightarrow$  the proposed MRLs are rejected



# Intake calculation for residue gathering from monitoring program

- Use current formulas
- Use means and HR for chronic and acute intake calculation
- Submit the result of risk assessment to risk manager for consideration



# Opinion on Proposal

- **MRL**

Using MRL → acceptable if Tier approach

- Tier 1 : using MRL
- Tier 2 : using STMR, HR

- **Unit weight**

Agree with the harmonisation of guidelines for unit weight, **but** the data can be different among region.



# Opinion on Proposal

- **Variability factor**

The figure(s) should be from the study

- **Processing / cooking factor =>**Another factor leads to the result of different MRLs  
Could they be harmonised??



# Conclusion

- No objection on applying the MRLs but tier approach should be applied as well.
- Agree with the establishment of guidelines of generating of the unit weight.
- Propose for consideration of processing / cooking factors
- Propose for establishment of the guideline of inspection management on pesticide residues based on risk



Thank you  
Any Questions?

