

Challenges to a Safe and Sustainable Vegetable- Risk assessment in leafy vegetable production systems in Cambodia



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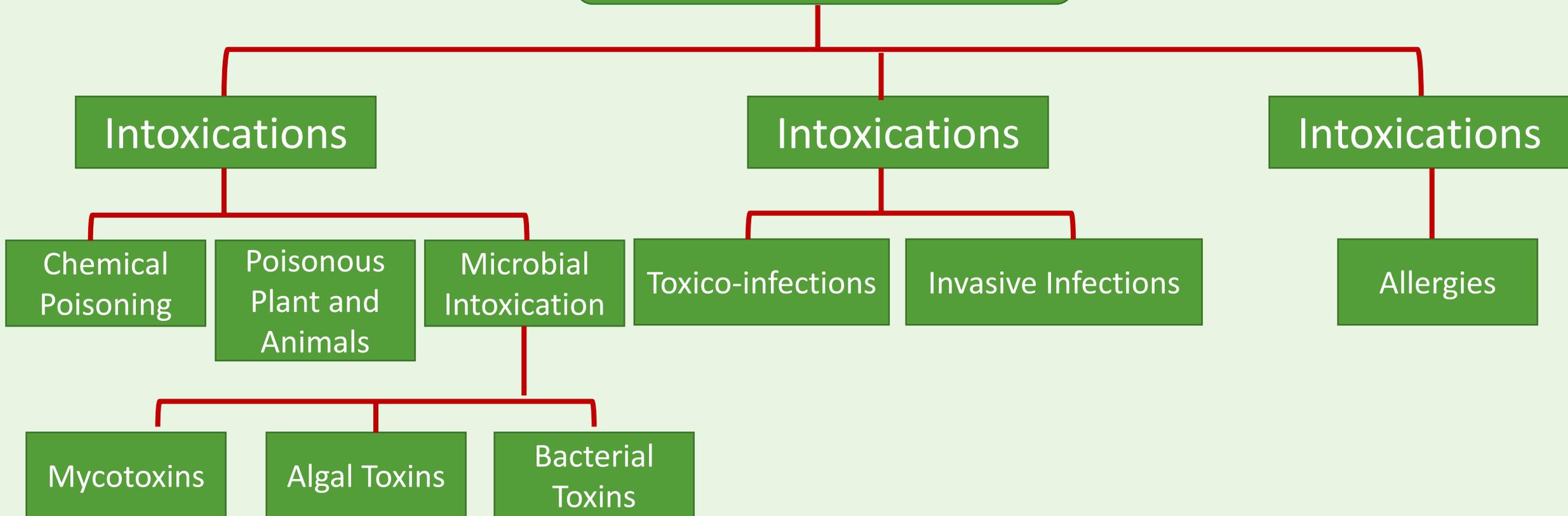
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General Information

Risks in Foods

Foodborne Diseases





General Information

Thailand's Pilot Study on Foodborne Diseases

Based on Thailand's National Notifiable Disease Surveillance System

- In 2009 – 10 to 35 million foodborne infections
- Main etiologic agents: Salmonella, V. cholera, Shigella and E. coli
- Liver fluke infection (*Opisthorchis viverrini*)

(WHO Report, 2015)



General Information

Foodborne Disease Estimates by CDC in the U. S.

	Million cases/year	Deaths/year
Total foodborne diseases/year	47.8	3,037
Known causes (bacteria, virus...)	9.4	1,351
Unknown causes	38.4	1,686

200 known diseases are transmitted through food

(Scallan et al, 2011)



General Information

Factors may Contribute to Foodborne Diseases

1. Implementation of enhanced epidemiological surveillance
2. Advances in microbiological methods
3. Changes in agricultural practices
4. Complex food production, processing and distribution systems
5. New virulent and/or resistant strains
6. Globalization
7. Decreased immunity (Comfortable life, less exercise? More pollution...)
8. Consumer preferences



Risk assessment in 51 Leafy vegetable farms

Aug 2016 – January 2017

No.	Village	Location		
		Commune	District	Province
1	Tanou	Sa Ang Phnom	Sa Ang	Kandal
2	Toul Speu	Talon		
3	Klakoh	Klakoh		
4	Rorkar Loeu	Khob		
5	Anlong Trosek	Sre Ambel		
6	Krong	Krong Yauv		
7	Andoug			
8	Toul Krouch			
9	Koh Brak	Phoum Thom	Kien Svay	
10	Koh Phost	Dey Et		
11	Dey Et			
12	Buos Ankang	Prek Ang	Chbar Ampao	
13	Chong Prek			

1. Identified risks in leafy vegetable farms

- 35.3%- high, 25.5-medium and 7.8%-low identified risks
- Farmers' knowledge in the aspect of chemical & hygiene is weak
- Chemical & biological contamination readily happen in farms

2. Identified High Risks Leading to Chemical Contamination

- Farmers apply agrochemicals relying on own experience and recommendation from other farmers & salers but not instruction from labels or chemical advisers.
 - • excessive residues or improper application



2. Identified High Risks Leading to Chemical Contamination

- 80% farmers mix 2-3 kinds, 12% mixed 4-6 kinds, 2% mix up to 5-8 kinds of agrochemicals in one spray.
 - • change of active ingredients and excessive MRL
- Holding period less than 7 days after agrochemical spray
 - • excessive MRL



2. Identified High Risks Leading to Chemical Contamination

- Farmers without training on agrochemicals use
 - residues exceeding MRL from inappropriate application
- Farmers unaware of authorized suppliers and approved agrochemicals
 - Application of unapproved chemicals, excessive residue on vegetables



2. Identified High Risks Leading to Chemical Contamination

- Waste (including agrochemical waste) disposed near the production sites
chemical or biological contamination to produce



3. Identified High Risks Leading to Biological Contamination

Harvest vegetables direct contact with soil
→ pathogen contamination on vegetables



1. Identified risks in Cucumber farms

- Farmers' knowledge in dealing with agrochemicals and hygiene issues are worse than those from leafy vegetable farms
- 60%-high, 12.5%-medium and 10% low identified risks
- Chemical and biological contamination readily happen in farms
- Share similar risks with the leafy vegetables farms but more high risks identified.

2. Identified High Risks Leading to Biological Contamination



Easy access for domestic animal entering production sites and packing/storage area

- ➔ biological contamination through contact of their fur, fluid, faeces with vegetables, equipment, containers and materials



Farmers not having training on personal hygiene, no proper personal hygiene instruction to worker

➔ biological and physical contamination on produce from their activities

Toilets and washing facilities not available for workers around production/packing areas

➔ biological contamination through human.



Using untreated/improperly composted animal manure as fertilizer.
→ Pathogen contamination to vegetables.



Water not analyzed before use

- • Possible chemical and biological contamination



Not checking the cleanliness of transport vehicle

→ chemical or biological contamination to produce

Not ensuring the postharvest equipment/containers are soundness and cleanliness before use

→ produce contamination from contact with dirt, faeces, agrochemicals, fertilizers or others

IV

Risk Treatment

- In order to reduce the identified risks to an acceptable level, there is a urgent need to provide trainings to farmers who are involved in this study, collectors and retailers to address the chemical and hygiene issues.
- Training
 1. Chemical application
 - a. introduce the legal chemicals especially pesticide application.
 - b. Advice of where to locate the authorised suppliers and how to differentiate the approved and banned agrochemicals
 - c. Information of what to do with the disease/insects on leafy vegetables and cucumbers and probably other crops as well
 2. Application of fertilizers
 - how to compost/treat the animal manure before use.
 3. Postharvest handling
 - educate farmers, collectors and retailer about the hygiene issues which affect the quality and safety of vegetables.

Acknowledgement

- My sincerely thanks to ACIAR project ASEM/2012/081 on “Improving market engagement, postharvest management and productivity of the Cambodian and Lao PDR vegetable industries” for the financial and technical support to these studies.
- My most profound thanks to the project members from PPO/CARDI, GDA and RUA for their wonderful gathering information from farmers

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