



## MODULE 1: Food safety and quality in primary production

### COURSE TITLE: 1.1 FOOD SAFETY ISSUES AND FOOD SAFETY MANAGEMENT SYSTEMS IN PRIMARY PRODUCTION

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<b>Course Title: 1.1 Food SAFETY ISSUES AND FOOD SAFETY MANAGEMENT SYSTEMS in primary production .....</b>	<b>1</b>
<b>Credits: 4 (3-1-8) .....</b>	<b>2</b>
<b>LANGUAGE OF COURSE DELIVERY: .....</b>	<b>2</b>
<b>Workload: 210h .....</b>	<b>2</b>
<b>Prerequisites: Microbiology, Chemistry .....</b>	<b>2</b>
<b>COURSE OBJECTIVES: .....</b>	<b>2</b>
<b>LEARNING OUTCOMES: .....</b>	<b>2</b>
1. Introduction and Overview: Hygiene and Food Safety Issues in Food chain	2
2. Food contaminants in primary production .....	2
3. Legislation and regulation for primary production.....	2
4. Food safety management systems in primary production .....	2
5. Case studies: Crop production, animal production and fishery production	3
<b>LABORATORY SESSION: .....</b>	<b>4</b>
<b>Skills Development Matrix .....</b>	<b>5</b>
<b>Teaching and Learning Methods .....</b>	<b>6</b>
<b>Time Distribution and Study Load: .....</b>	<b>6</b>
<b>Evaluation Scheme .....</b>	<b>7</b>
<b>Assessment of Case study and Assignments: .....</b>	<b>8</b>
<b>Alignment Matrix of Module Learning Outcomes .....</b>	<b>10</b>

## **CREDITS: 4 (3-1-8)**

1 credit: 15 H

(Lecture-Practice-Self learning)

Class (including presentation + farm visit) (contact hours): 90 H

Self-learning (assignment, written report, case study, self study): 120 H

TOTAL: 210 H/SEMESTER

## **LANGUAGE OF COURSE DELIVERY:**

ENGLISH or FRENCH, and national languages (THAI, VIETNAMESE, KHMER)

## **WORKLOAD: 210H**

## **PREREQUISITES: MICROBIOLOGY, CHEMISTRY**

### **COURSE OBJECTIVES:**

To provide the students with an understanding of food contaminants and how to control the factors influencing the safety of agricultural products, and also to implement management system to ensure the safety of agricultural products

### **LEARNING OUTCOMES:**

Student could be better able to:

**LO 1:** Recognize and identify the food contaminants influencing the safety of agricultural products

**LO 2:** Understand and apply properly the national and international legislation/ regulation

**LO 3:** Implement food safety management systems for primary production

**LO 4:** Evaluate food safety management systems and recommend the preventive measures

**LO5:** To be able to research a topic, synthesis current information and develop a presentation related to food safety and food quality

### **COURSE OUTLINE**

#### **1. Introduction and Overview: Hygiene and Food Safety Issues in Food chain**

#### **2. Food contaminants in primary production**

2.1. Biological hazards and risk assessment

2.2. Chemical hazards and risk assessment

2.3. Physical hazards

#### **3. Legislation and regulation for primary production**

3.1 Fundamentals of food laws

3.2 CODEX Alimentarius, WTO-SPS agreement and other regulatory bodies (FAO, WHO, EU)

3.3 Regulatory requirements and status of safety of agricultural products in ASEAN countries

#### **4. Food safety management systems in primary production**

4.1 Introduction

#### **1.1 Food Safety Issues and Food Safety Management Systems in Primary Production**



- 4.2 Good Agriculture Practices (GAP, GTP, GSP, COC)
- 4.3 Good Hygiene Practices
- 4.4 Good Manufacturing Practices
- 4.5 HACCP
- 4.6 Others (organic, private certification)
- 4.7 Traceability
- 4.8 Environmental management
- 4.9 Inspection and audits

**5. Case studies: Crop production, animal production and fishery production**

## Detail Course outline (Lecture hours)

1. Introduction and Overview: Food Safety Issues in Food chain (2 hours)
  - Global food safety crisis focusing on primary production; their origin, impacts and solutions
  - Example of ASEAN food safety issues
2. Food contaminants in primary production (15 hours)
  - 2.1. Biological hazards and risk assessment
    - Foodborne pathogens (bacteria, parasites, viruses), prions
    - Biological risk assessment methodology
  - 2.2. Chemical hazards and risk assessment
    - Animal drug, mycotoxins, pesticides, feed additives, pollutants and heavy metals
    - Chemical risk assessment methodology
  - 2.3. Physical hazards
3. Legislation and regulation for primary production (5 hours)
  - 3.1 CODEX Alimentarius, WTO-SPS agreement and other regulatory bodies (FAO, WHO, EU)
  - 3.2 Regulatory requirements and status of safety of agricultural products in ASEAN countries
4. Food safety management systems in primary production (20 hours)
  - 4.1 Introduction
    - Overview of food safety management systems
    - Prerequisite programs
  - 4.2 Good Agriculture Practices (GAP, GTP, GSP, COC)
    - Principle of GAP, GTP, GSP, COC focusing on the food safety aspects
  - 4.3 Good Hygiene Practices (GHP)
    - CODEX GHP
    - Hand washing, personnel hygiene, prevent cross contamination, cleaning and sanitizing
  - 4.4 Good Manufacturing Practices (GMP)
    - Overview of GMP, CODEX and national GMP
  - 4.5 HACCP
    - Principle and prerequisite of HACCP
  - 4.6 Traceability
    - Principle in whole food chain (tracking and tracing)
    - Application of traceability system in primary production (food crops, animal and fishery products)
  - 4.7 Environmental management {waste management in animal production, drainage in water resources, waste/ residue from crop production, pesticide container (solid waste management)
  - 4.8 Inspection and audits
    - Inspection: Official control of the implementation of legislation in primary production
    - Audit: Certification of food safety management system
5. Case studies: Crop production, animal production and fishery production (3 hours)

**LABORATORY SESSION:** None

Benchmark Los	Knowledge	Skills	Competence	Suggested EQF levels
LO1	X	X		6
LO2	X	X		7
LO3	X	X	X	7
LO4	X	X	X	7
LO5	X	X		6

### Learning Outcomes (LOs)- Course Content Matrix

	1	2	3	4	5
LO1	X	X			X
LO2	X		X		X
LO3	X	X	X	X	X
LO4	X	X	X	X	X
LO5	X		X	X	X

### Skills Development

#### SKILLS DEVELOPMENT MATRIX

<b>Skills (Discipline specific)</b>	
Food contaminants	IP
Risk assessment	IP
Legislation and regulation	IP
Food Safety Management Systems	IPA
Inspection and audits	IPA
<b>Transferable Skills</b>	
Independent learning	P
Time management	P
Oral communication	PA
Written Communication	PA
Co-operative learning	P
Leadership	P

I: Introduced, P: Practice, A: Assessed

### Outcome-Method Table

#### Intellectual Outcomes

Intellectual outcomes	Teaching methods or activities
Students will be better able to:	
Recognize and identify the food contaminants influencing the safety of agricultural products	Classroom lecture, practical (possibly guest speaker), review and compare articles, seminar and presentation, pre and post test, case studies
Understand and apply properly the national and international legislation/ regulation	Classroom lecture, assignment, case studies

## Skills Outcome

Skills outcome	Teaching methods or activities
Students will demonstrate the ability to:	
1. Develop and implement food safety management plan for primary production	Classroom lecture, case studies, farm visits, virtual visit (video), presentation
2. Evaluate food safety management systems and recommend the preventive measures	Classroom lecture, case studies, farm visits, virtual visit (video), presentation, audit and inspection exercise (role play)

## Attitudinal Outcome

Attitudinal outcomes	Teaching methods or activities
Students will increasingly be able to:	
1. Systemically search, select and evaluate the literature and other relevant materials on food safety	Case studies (individual or group), farm visits
2. Plan and manage to do the research and identify issues related to food safety in primary production	Case studies (individual or group), farm visits
3. Be responsible towards food safety	Case studies (individual or group), farm visits

## TEACHING AND LEARNING METHODS

The course is delivered via lectures, reading materials including the recent literatures and practical problem solving in food safety issues. Additional online and recent information will be provided to enhance self-learning experiences. Active learning is encouraged and students' understanding of each modules or subtopics is evaluated via featured examples, practical questions, relevant case studies, assignments and presentations.

1. Lecture
2. Reading (self study, glossaries)
3. Practical (HACCP plan, risk assessment, test kit for pesticides, antibiotics, mycotoxins, microbiology : small hand on laboratories sponsored by companies).
4. Online material (videos)
5. Case study
6. Farm visit (orientation, observation report, check list practice)
7. Review and compare article (assignment, group discussion, group work)
8. Seminar/ Presentation (seminar attendance, report) (ex 10)
9. Peer and self assessment (ex 13)

## TIME DISTRIBUTION AND STUDY LOAD:

1. Lecture: 45 hours
2. Assignments: 30 h
3. Case study and Presentation: 45 h
4. Self study: 90 hours

Chapter	Lecture hour	Farm visit	Presentation	Self-study/Assignment	Report
1	2			4	
2	15	10	10	20	20
3	5			6	
4	20		5	20	20
5	3	10	10	15	15
<b>Total</b>	<b>45</b>	<b>20</b>	<b>25</b>	<b>65</b>	<b>55</b>

## Assessment

Total (%)		LO <sub>1</sub>	LO <sub>2</sub>	LO <sub>3</sub>	LO <sub>4</sub>	LO <sub>5</sub>
10	Specific assignment		7			3
10	Seminar Presentation	7				3
24	Case study (group)	4	4	6	6	4
16	Farm visit (report and group presentation)	3	3	3	3	4
40	Final exam	10	10	10	10	

Report: structure of report (20%) , writing skills (20%) , analysis results (20%), discuss and explanation of results (40%).

## EVALUATION SCHEME

An “A” would be awarded if a student can show the ability having elaborative knowledge on; elaborate, formulate and solve problems related to this module. A “B” would be awarded if a student shows an overall understanding of the topics covered, a “C” would be given if a student meets below expectation on both knowledge acquired and analysis. A “D” would be given if a student does not meet basic expectations of the topics presented in the course.

## Assessment Specification Grid

Activities	LO1	LO2	LO3	LO4	LO5	Total
Assignment 1		8			2	10
Assignment 2	8				2	10
Assignment 3	3	3	3	3	4	16
Case study	4	4	6	6	4	24
Examination	10	10	10	10		40
Total	25	25	19	19	12	100

\*Assignment 1: Seminar presentation (Food contaminant)

Assignment 2: Written report (legislation)

Assignment 3: Report and presentation of farm visit

\*Case study: food crops, animal food, fishery products

#### **ASSESSMENT OF CASE STUDY AND ASSIGNMENTS:**

- Understanding the concept and topics properly
- Demonstrate the specifically sound of the evident-based case analysis
- Concise reviewing the relevant literature on relevant topics
- Interpret the acquired data and analyze scientifically
- Describe the results comprehensively and writing skills in the report
- Clear oral presentation

#### REFERENCES

Websites:

FAO (Food and Agricultural organization): <http://www.fao.org/home/en/>

Codex alimentarius: <http://www.fao.org/fao-who-codexalimentarius/codex-home/en/>

EFSA (European Food Safety Authority): <http://www.efsa.europa.eu/>

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## ALIGNMENT MATRIX OF MODULE LEARNING OUTCOMES

Corresponding EQAS LO	Module LO	Units developing the LO	Extent of alignment with EQAS LO (maximum total for an EQAS LO 100%)
<b>Learning Outcomes for Food Safety and Microbiology</b>			
Describe the properties of common food spoilage organisms. Experimentally determine their presence and numbers. Demonstrate a critical understanding of instances of food spoilage, causation and prevention.	LO 1: Recognize and identify the food contaminants influencing the safety of agricultural products	2	
Describe the properties of common food poisoning organisms, their toxins and means of detection. Experimentally determine the presence of food poisoning organisms. Demonstrate a working knowledge of food-borne infections/intoxications, evaluating causation and prevention.	LO 1: Recognize and identify the food contaminants influencing the safety of agricultural products	2-4	
<b>Learning Outcomes for Food Chemistry and Analysis</b>			
Demonstrate an awareness of the relationship between food, nutrition and health.	LO 1: Recognize and identify the food contaminants influencing the safety of agricultural products	2, 4	
	LO 4: Evaluate food safety management systems and recommend the preventive measures	4	
<b>Quality Management and the Law</b>			
Demonstrate an understanding of the principles of quality management systems in the food industry, the range of documentation required and its use.	LO 2: Understand and apply properly the national and international legislation/ regulation	3	
	LO 3: Implement food safety management systems for primary production	4	
	LO 4: Evaluate food safety management systems and recommend the preventive measures	4	
Describe the legal framework that applies to the food industry, the principle legal requirements, enforcement and the penalties that can be applied within a defined jurisdiction.	LO 2: Understand and apply properly the national and international legislation/ regulation	3	
	LO 3: Implement food safety management systems for primary production	4	
Demonstrate a critical understanding of the role of food provenance in maintaining food quality. Undertake an	LO 2: Understand and apply properly the national and international legislation/	3, 4	

Corresponding EQAS LO	Module LO	Units developing the LO	Extent of alignment with EQAS LO (maximum total for an EQAS LO 100%)
analysis demonstrating how a food product can be authenticated.	regulation		
	LO 4: Evaluate food safety management systems and recommend the preventive measures	4, 5	
<b>Generic Competences Communication abilities, ethics and personal skills</b>			
Able to plan and carry out an experimental investigation under supervision and write a scientific report following standard conventions.	LO 4: Evaluate food safety management systems and recommend the preventive measures	4, 5	
Communicate scientific ideas through written, oral and visual means in English. Able to discuss these ideas at a higher level.	LO 3: Implement food safety management systems for primary production	4, 5	
	LO 4: Evaluate food safety management systems and recommend the preventive measures	4, 5	
Evaluating their own achievement by developing a capacity for self-reflection and that of others by participating in peer-review.	LO 3: Implement food safety management systems for primary production	4, 5	
Demonstrate autonomy, self-direction, initiative and effective decision making in complex and unpredictable situations.	LO 3: Implement food safety management systems for primary production	4, 5	
	LO 4: Evaluate food safety management systems and recommend the preventive measures	4, 5	