



# **Scientific Developments and Technical Challenges in the Progressive Control of FMD in South Asia**

**13 – 15 February 2012**

**New Delhi, India**

**Southeast Asia: Action plans, Future directions and needs**

**OIE Reference Laboratory for FMD**

**Regional Reference Laboratory for FMD in South East Asia (RRL)**

**National Institute of Animal Health,**

**Department of Livestock Development**

**Pakchong, Thailand**



# Outline

- **Action plans**
  - **RRL mission**
  - **Laboratory Diagnosis**
  - **Quality Assurance program in SEA region and FMD Laboratory network**
- **Future directions and needs**



# Action plans

## 1. RRL Mission

1. To serve as the OIE Reference Laboratory for FMD to OIE member countries
2. To serve as the central or national lab for FMD diagnosis within Thailand (total 8 Veterinary Diagnostic Centers )





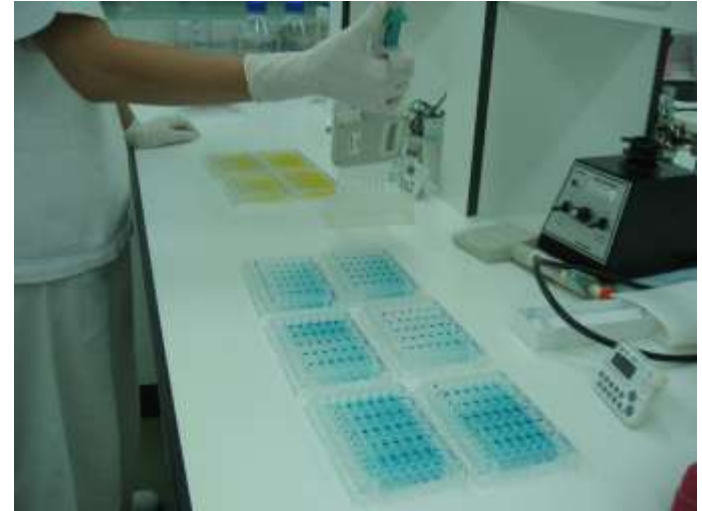
**3. FMD Diagnosis by ELISA typing, Virus isolation,**

**LP ELISA, NS test and PCR**

**4. Strain differentiation for seed  
vaccine selection and vaccine  
matching**

**5. Molecular epidemiology by  
nucleotide sequencing**

**6. Production of diagnostic  
reagent for FMD diagnosis**





**7. Training center and technology transfer in the region**

**8. Establishment Quality Assurance Control system  
in the region**

**9. Provide the proficiency testing and inter-laboratory  
comparison for FMD laboratories within the country  
and ASEAN member countries**

**10. Collaborative research work among  
the institutes and international  
organizations: OIE, WRL, FAO, AAHL  
& JICA**



## 2. Laboratory Diagnosis



### FMD Diagnostic Chart

#### Antigen detection

- \* ELISA typing
- \* Virus isolation
  - Pri. lamb kidney cell
  - BHK 21 Cell line
- \* RT- PCR
- \* Nucleotide Sequencing

#### Antibody detection

- \* LP ELISA Test
- \* NS test
- \* VIA -AGID

#### Reagent production

- \* Rabbit anti FMD
- \* GP anti FMD
- \* Inact. FMD antigen

#### Research/Collaboration

- \* **Strain characterization & collection**
  - Antigenic variation ( r -value)
  - Genomic variation (dendrogram)



# **samples received in 2011**

## **Tissue samples**

- Thailand = 86 samples**
- Sri Lanka = 4 samples**
- Laos = 20 samples**
- Cambodia = 31 samples**

## **Serum samples**

- Thailand = 8,565 samples**
- Myanmar = 450 samples**
- Cambodia = 28 samples**



### 3. Quality Assurance program in SEA region and FMD Laboratory network



#### 1. International quality standard



RRL has accredited by ISO /IEC 17025:2005 from  
Accreditation Body in Thailand , Bureau of Laboratory  
Quality Standard, Dept. of Medical Science



#### Accreditation scopes:

- Antigen typing test by ELISA technique
- Antibody measurement by LP ELISA
- 3B Non structural protein (NS ) test
- 3ABC Non structural protein (NS) test



## 2. Harmonization of test method for FMD diagnosis



### 1. ELISA typing : SOP has been prepared (English and Thai version)

Standard Operating Procedures:	Code : RRL-T-002
 Regional Reference Laboratory for FMD in South East Asia	Date : 7/09/2009
Subject : Liquid Phase Blocking ELISA	Page : 1 of 25
	Prepared by : Wilai Lanchongsubongkoch

Liquid Phase Blocking Enzyme Linked Immunosorbent Assay (LP ELISA)  
for Detection of Antibodies of Foot and Mouth Disease Virus:

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### 2. LP ELISA : SOP has been prepared (English and Thai version)

Standard Operating Procedures:	Code : RRL-T-001
 Regional Reference Laboratory for FMD in South East Asia	Date : 7/09/2009
Subject : ELISA Typing Test	Page : 1 of 18
	Prepared by : Wilai Lanchongsubongkoch

ENZYME LINKED IMMUNOSORBENT (ELISA)  
FOR DETECTION OF FOOT AND MOUTH DISEASE ANTIGEN

SECTION	CONTENTS	PAGE
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### **3. Quality Assurance program in SEA region**



#### **Aim:**

- 1. Upgrade diagnostic laboratory within the region to meet standard such as ISO 17025:2005 or OIE standard.**
- 2. Implement biosafety and biosecurity in diagnostic laboratory**
- 3. Assist field veterinarian in good quality sample collection including packing and transportation between field to the lab under the biosecurity principle.**
- 4. Implement member country in submission sample to RRL by international airline using standard container approved by IATA .**



**Activities to upgrade or improve the quality assurance program in SEA region are:**

- 1. Participating in inter-laboratory comparison testing or proficiency testing annually**
- 2. More sample submission to RRL regularly in order to confirm their laboratory diagnostic results**

## Quality assurance program of the RRL in 2011



- 1. Organize the 3<sup>rd</sup> round of interlaboratory comparison testing on foot and mouth disease(FMD) ELISA typing, FMD serology by LP ELISA and NSPs test. This year has been conducted during March- August by 2011, 16 FMD laboratories within Thailand and member countries have been participated.**
- 2. Participating in Proficiency testing on FMD diagnosis organized by WRL, Pirbright Laboratory(During Aug-Sep 2011. The PT results has been submitted to WRL, 10<sup>th</sup> Oct 2011.**



- 3. Submission a big group of FMD sample to WRL, UK annually for confirmation of FMD diagnostic result (This year : Total 34 samples were submitted in July 2011. )**
- 4. Maintain the ISO 17025:2005 certified by**
  - conducted the Internal audit for the RRL staff**
  - Improve and update the ISO document such as Quality manual, Procedure manual, work instruction, test method, validation and verification of reference diagnostic reagents, calibration of equipment**

# FMD training center and technique transfer in the region



## Training OIE member country in 2010-2011

### 1. Two trainees from Bhutan received training on FMD diagnosis





## 2. Dr. January from Philippines received training on FMD diagnosis during 12 -26 Oct 2010







### 3. Two trainees from Sri Lanka received training on FMD diagnosis during 12-27 Feb 2011





#### 4. Five trainees from China received training on FMD diagnosis during 29 August – 2 September 2011



# Request for training and collaboration



**All member countries request for  
information, reagent supply,  
training and research collaboration**

**contact**

**Director General**

**Department of Livestock Development**

**Phaya Thai Road, Bangkok 10400, THAILAND**

**Tel: +66 2 6534400 Fax: +66 2 6534900**

**Email: [dg@dld.go.th](mailto:dg@dld.go.th)**



# Research activities

1. Development of Production of Foot and Mouth Disease ELISA reagent kit
2. Molecular Epidemiology Analysis of Foot and Mouth Disease Virus isolated in Thailand and South East Asia during 2010-2012
3. Development of Real-Time PCR for the Diagnosis of Foot and Mouth Disease
4. Study of seromonitoring and disease status of FMD of elephant in Thailand
5. Whole Genome Sequence Analysis of Foot and Mouth Disease Virus Isolated in Thailand
6. Study on foot and mouth disease status in sheep and goats in Thailand



# Submission of sample to RRL

## 1. Sample

- Infected tissue should be kept in 50% glycerin buffer, pack in strong container
- Blood/serum should be kept in a screw cap vials with O-rings





## 2. Packaging and submitting of sample to RRL should be followed the guideline protocol :

- IAH, Pirbright
- UN, AUS 3356



UN code 602 for Infectious substance





UN code 650  
for non Infectious substance





<b>Sender details</b>	<b>Owner Details</b>
Country:.....	Owner's name:.....
Your Reference No.:.....	Address:.....
Name of Institute:.....	.....
.....	.....
Address:.....	District/Province:.....
.....	Region:.....
Tel:.....Fax:.....	Country:.....
Email:.....	Tel:.....Fax:.....

<b>1. Sample Details:</b>						
<input type="checkbox"/> Epithelium tissue <input type="checkbox"/> Vesicle fluid <input type="checkbox"/> Virus culture <input type="checkbox"/> Serum <input type="checkbox"/> Other .....						
Number of animals sampled: .....						
Sample Identification: .....						
Data collected: .....d.....d.....			Date of dispatched: .....d.....d.....			
Data first noticed: .....d.....d.....		Date of report .....d.....d.....		Number of herd involved /Duration of outbreak: .....		
Species	sex	No. of animals affected, in outbreak or dead		Date of previous infection and serotype		
Cattle						
Buffalo						
Pig						
Other						
More details: .....						
.....						
<b>2. Vaccination history:</b>						
Species	Vaccinated Yes      No		Date of last vaccination	Type of vaccine or serotype	Vaccine producer	Batch no.
<b>3. Outbreak investigation /method of spread/Control measures:</b>						
.....						
.....						
<b>4. Comments</b> .....						
.....						
<b>5. Signature</b> ..... <b>Date</b> .....						

**Example Form for  
filling history of  
sample submission  
to RRL, Thailand**

### 3. Shipment Address:

TO Regional Reference Laboratory for FMD in South East Asia  
Department of Livestock Development Pakchong, Nakhonratchasima  
30130 THAILAND

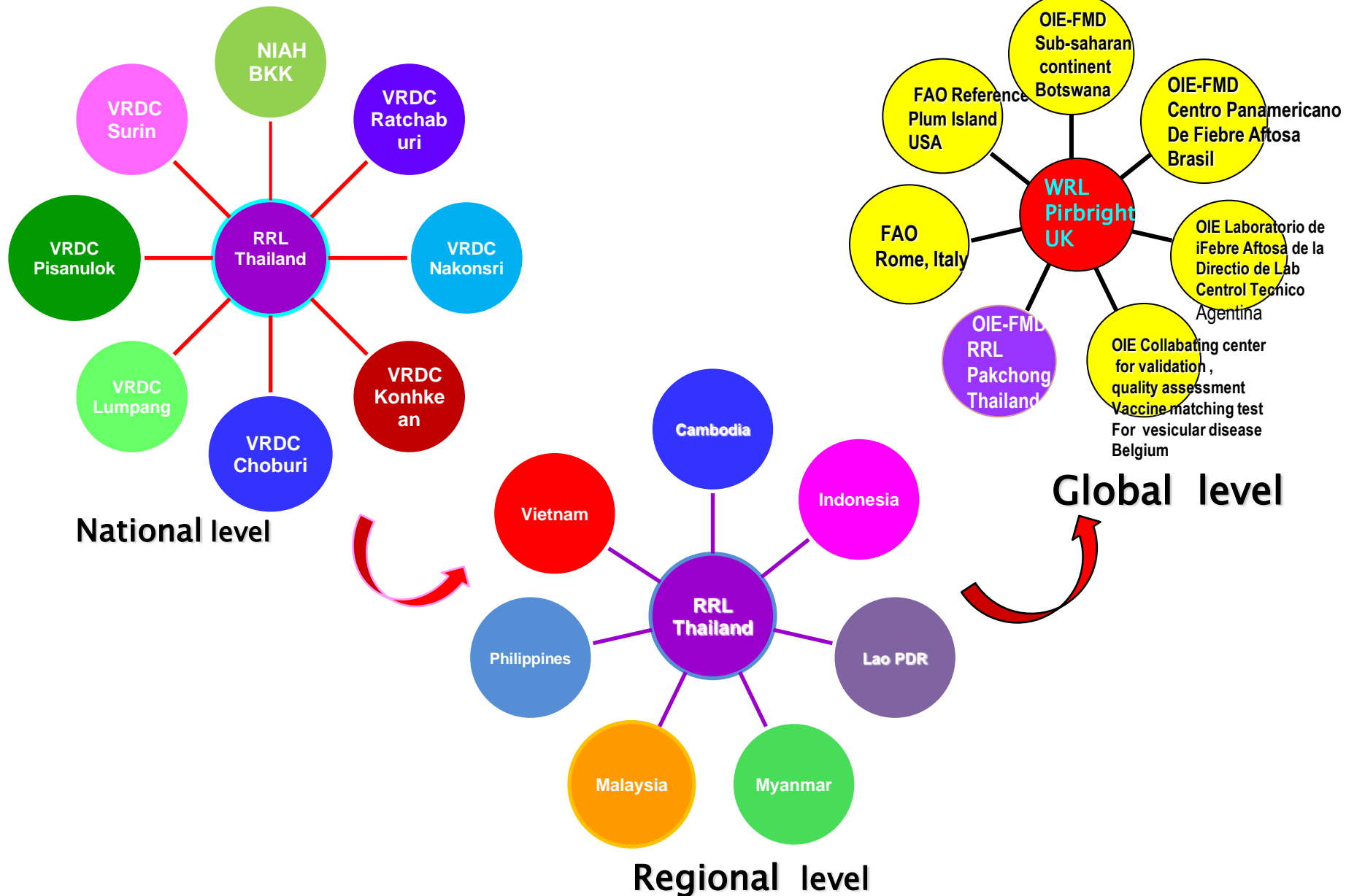
Tel: +66 44 279112, 313 869 Fax: +66 44 314889

Email: [rrl@dld.go.th](mailto:rrl@dld.go.th)

### 4. Airport destination : Bangkok International Airport



# FMD Laboratory network



# The 5<sup>th</sup> SEAFMD Lab Network, Vientiane , 11-12 Mar 2010,

## Outcome:

1. Improving collection good quality sample by using standard container approved by IATA



1.2 Achievement of participation on first round of inter-laboratory comparison testing

- Reports have been distributed to member countries



# The joint meeting of The 6th SEACFMD LabNet and Epinet Pakchong, Thailand , 2-3 March 2011



## Outcome:

- 1.1 The progress of sample submission to the RRL,
- Member countries had submitted more samples to RRL in 2010 and 2011 ; such as Cambodia, Vietnam, Myanmar and Lao PDR and Sri Lanka







## 1.2 Lecture on packing and transporting of infectious substances follow WHO and IATA regulation



### 1.3 Second round of Inter-laboratory comparison testing has been organized and the reagent with samples have been distributed to participating laboratories ( 16 Labs)







**Inter-lab reports round 2011 has been completed (Thai and English version) and already distributed to all participating labs in NC meeting , Hanoi , 11-16 Sep 2011.**



# **The 6<sup>th</sup> Annual meeting OIE/FAO Reference Laboratory Network meeting, 3-6 October 2010, WRL , Pirbright , UK**



## **Principle and goals:**

- 1. Understand global virus distribution and making vaccine recommendations**
- 2. Improving the quality of laboratories tests from international and national reference laboratories**

## **Outcome of 6<sup>th</sup> annual meeting of OIE/FAO Reference Laboratory Network in 2009 and 2010**



- **Update global and regional FMD situation**
- **Report of inter-laboratory comparison on vaccine matching organized by WRL**
- **Plans for future inter-laboratory vaccine matching and Proficiency testing (PT)**
- **Recommend the reference vaccine strain for each viral pool**

# Future directions and needs



1. The 7<sup>th</sup> SEACFMD Lab network meeting will be held in China (date has not fix) under the support of OIE-SRR
2. Conduct the 3<sup>rd</sup> interlaboratory comparison testing on FMD serology and antigen typing test or proficiency testing by end of 2012, organized by RRL
3. Continuing participating in PT program organized by WRL
4. Continuing the sample submission to WRL in early 2012



## 5. Reagents supply for FMD diagnosis

- Rabbit trapping antibody for FMDV, type O, A and Asia1
- Guinea pig detecting antibody for type O, A and Asia1
- Inactivated FMD antigen; fresh and concentrated antigen
- Control serum; strong and weak positive serum
- PT samples for antigen typing ELISA and serology test antigen
- Inter-laboratory comparison reagents

## 6. FMD training and technique transfer

## 7. Project and Research activities



# Thank you for your attention

