

Update on SEACFMD member countries FMD Laboratory activities

12th SEACFMD Laboratory Network Meeting
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SEACFMD Laboratory Network

- Part of component 4 of OIE Sub-Commission for SEACFMD Campaign :
Disease surveillance, diagnosis, reporting and control
- Started in 2005 (Pakchong, Thailand)



- 10 SEA member countries + 2 (China and Magnolia)

📍 Brunei

📍 Cambodia

📍 Indonesia

📍 Lao PDR

📍 Malaysia

📍 Myanmar

📍 Philippines

📍 Singapore

📍 Thailand

📍 Vietnam

>China

>Mongolia

Role of Laboratory Network (LabNet)

- **Timely diagnosis of field FMD suspect samples**
 - **Emergency response, control and vaccination strategy**
- **Facilitate sending of field isolates to Ref. Labs.**
 - **Confirmation**
 - **Antigenic and genetic characterization**
- **Strengthen surveillance**
 - **Molecular epidemiology**
 - **Mapping on the evolution of FMDV serotypes**
- **Monitoring vaccine efficacy**
 - **Vaccine matching**

- **Capacity building on FMD diagnosis**
 - **Expert visits**
 - **Regular training programs**
 - **Proficiency Testing (PT)**
- **Harmonization of diagnostic protocols**
- **Quality assurance, Quality Control (QA/QC)**
- **Facilitate research activities**
 - **Prioritize areas for research**
 - **Joint research studies**
 - **Develop research proposals for possible funding**

2017 LabNet Recommendations	Progress	Remarks	Constraints (technical) in implementing the recommendation
1.Improve sample collection and submission	<p>(Phil's) Sample submission has improved from 61.1% in 2013 to 100.5% in 2018. As of Oct. 10, 2019, 74.6% of the annual target has been achieved.</p>		
	<p>(Indonesia) 1. In 2019, Samples were sent to the National FMD Laboratory, in a good condition. The quality and the number of sera are qualify</p> <p>2. Annual targeted sero surveillans program are implemented using risk base approach to demonstrate freedom from infection. Foccus Grup Discussion have held in 2018, It was attended by epidemiologist experts and director of Disease Investigation Centres to assess the risk factors</p>	<p>1. In the technical meeting, was attended by stakeholders, it was notified regarding the sample requirements that related to quality and quantity</p> <p>2. Several risk factors for the introduction of FMD are considered i.e:</p> <ul style="list-style-type: none"> • Bordering/close proximity with infected countries • llegal importation of beef and meat product • High population and high density off cattle and pigs • Pigfarming practicing swill feeding, • Distribution province/ area of imported meat from India 	
	<p>(Lao PDR)</p> <p>-Probang sample collection on job training in Xayabuly province</p> <p>-FMD sample collection training in target provinces of New Zealand FMD control project</p> <p>-FMD sample collection training in target provinces of ACIAR project(LPB, XYBL and XK)</p>		<p>When has outbreak some area not report, disease report late</p> <p>Sample Low quality.</p>
	<p>(Malaysia) Implemented</p>	<p>Through :</p> <p>1.Consultation whenever required</p> <p>2.Improve transport media by adding glycerol (1:1)</p>	
	<p>(Myanmar) Nationwide improve for sample collection</p>	<p>conducted Sample collection and reporting training to all township officers by OIE-LBVD FMD Control Project(2018)</p>	<p>- Practical and Training duration is very limited</p>
	<p>(Singapore) Sample collection and submission system established</p>		

2017 LabNet Recommendations	Progress	Remarks	Constraints (technical) in implementing the recommendation
2. Use of molecular techniques to complement ELISA based assay.	(Phil's) FMD real-time PCR based on Reid et al., 2001 and Callahan et al., 2002		
	(Indonesia) Laboratory using Real time PCR to detect FMD antigen besides using NSP elisa to detect antibody from FMD suspect. In 2019, The results are negatif	Detection of FMD antigen by real time PCR was certified by ISO 17025 in 2018 Detection of FMD antibody by LBP and NSP Elisa was certified by ISO 17025, 2016	Limited positif control is problem for laboratory and using sintetic positif control instead
	(Lao PDR) We did probang and swab sample collection and used Real time PCR for testing		
	(Malaysia) Implemented	At the moment we are sharing PCR machine at Avian virology unit.	1.New staff need more training.
	(Myanmar) Conventional PCR	-Since 2018, Conventional PCR technique is used for Parallel tests of FMD	-Reagents and kit are limited -To confirm and precise results , Real time PCR and Sequencing are required
	(Singapore) Use of Real time RT-PCR for screening; sequencing PCR and NGS capability developed		

2017 LabNet Recommendations	Progress	Remarks	Constraints (technical) in implementing the recommendation
3. Explore the use of Solid-Phase Competition ELISA (SPCE)	(Phil's)	We use commercial NSP ELISA kit (Prionics).	
	(Indonesia) Laboratory hasn't use SCPE, because we haven't the training yet	Hopefully getting the training to improve the laboratory performance	
	(Lao PDR) We did only when the some research project request for and provide the kit		
	(Malaysia) Not implemented yet		Short of staff and budget
	(Myanmar) Pribright kit and PrioCHECK kit	Provided by IAEA project	Kits are limited
	(Singapore) Use of IZSLER's SPCE kits for FMD O, A, Asia1 antibody detection		

2017 LabNet Recommendations	Progress	Remarks	Constraints (technical) in implementing the recommendation
4. Synergise resources from other diagnostic units e.g. HPAI to improve capacity of FMD diagnosis.	(Phil's)	The FMD Laboratory has its own fund source for resources, hence, sourcing from other laboratory units is minimal or nil.	
	(Indonesia)	It is needed the training for a new employees to improve the National FMD laboratory performance	
	(Lao PDR)	We use the Real time together	
	(Malaysia) Implemented	The only PCR machine available in the laboratory	
	(Myanmar) -Sharing resources from other laboratories (Veterinary Diagnostic Laboratories and Biologic laboratories)	Cell culture plaques , materials , chemical , and others are sharing	
	(Singapore) Separate fund for FMD surveillance is available - Annual serological surveillance at local cattle and goat farm; monthly serological surveillance for imported pigs	Singapore is prepared to contribute the diagnostic and research capacities and capabilities to the region	

2017 LabNet Recommendations	Progress	Remarks	Constraints (technical) in implementing the recommendation
5. Sharing of information/report	<p>(Phil's)</p>	<p>FMD Lab. Reports are released to the responsible BAI Division.</p> <p>Positive test results are immediately relayed to provincial/regional officers for re-sampling of animals and retesting.</p>	<p>Delay in the transmittal of laboratory reports to provincial/regional officers by the responsible BAI Division.</p>
	<p>(Indonesia) The result of serosurveillans will be reported to Directorate General of Livestock and Animal Health Services and it will be combined with Sindromyc surveillans and negative surveillans reports from DICs., and it will be reported to OIE</p>		
	<p>(Lao PDR) -Submit the lab result to division of veterinary service to report to WAHIS. -Report result back to the sample origin province</p>		
	<p>(Malaysia) Implemented</p>	<p>FMD cases in Peninsular Malaysia is being reported in WAHIS interface regularly by Epidemiology and surveillance (DVS)</p>	
	<p>(Myanmar) Nationwide improve for reporting via report form and online network</p>	<p>-Conducted Sample collection and reporting training to all township officers by OIE-LBVD FMD Control Project(2018) -Conducted FMD training to CAHWs and TVO in vaccine campaign area by OIE-LBVD FMD Control Project(2018)</p>	
	<p>(Singapore) Singapore is currently free from FMD and will notify OIE immediately, if there is any FMD detection. Singapore abides by the necessary OIE reporting requirements.</p>	<p>Beyond sharing of test results, Singapore is prepared to work with regional laboratories on reviewing and refining methodology, as well as, inter-lab proficiency testing.</p>	

2017 LabNet Recommendations	Progress	Remarks	Constraints (technical) in implementing the recommendation
6. PVM program for monitoring herd immunity in vaccinating countries	(Phil's) Not applicable		
	(Indonesia) No PVM because Indonesia free from FMD		
	(Lao PDR) – - ACIAR project in LPB,XYL and XK province 2016 to 2019. - NZ project in Savanakhet, Champasack and Xiengkhoung provinces 2016 - NZ project the last PVM for monitoring will conduct in 2020		
	(Malaysia) Not yet implemented	Plan to be carried out next year 2020	
	(Myanmar) PVM program is improved	-Conducted in the vaccine campaign area by OIE-LBVD FMD Control Project	
	(Singapore) No FMD vaccination programme in Singapore	Singapore can play its part by providing testing services to regional countries.	

2017 LabNet Recommendations	Progress	Remarks	Constraints (technical) in implementing the recommendation
<p align="center">Improve sample collection and submission</p>	<p>Brunei: Reviewed and updated Guidelines for Sample Collection and Submission Animal Diagnostic (ADG) booklet (Third Edition 2019). Booklet is given to all program owner, farmers and private sectors requiring laboratory services. Held Client briefing for sample collection and submission as well as overview of laboratory services provided (once every two years) and conducted customer satisfaction survey (every year) for laboratory improvement and reviewing needs for new testing services. VLS achieved 100% satisfactory sample submission for FMD diagnosis in 2018.</p>	<p>Standard Operating Procedure (SOP) for collection, submission, storage, transport and referral of biological materials is still in drafting process. Target for implementation in 2020.</p>	<p>Requires training from experts for sample collection and submission and also for Sample Packaging and Transport.</p>
	<p>China: On-going</p>	<p>On-going</p>	
<p align="center">Use of molecular techniques to complement ELISA based assay.</p>	<p>Brunei: Detection of FMD using Conventional PCR is still in the process of acquiring materials for method development. (Source: AAHL)</p>	<p>The scope will target for ISO/IEC 17025 accreditation in year 2020/2021.</p>	<p>Requires practical hands-on training from experts.</p>
	<p>China: qRT-PCR and sequencing is in routine use</p>	<p>Completed and on-going activity</p>	

Explore the use of Solid-Phase Competition ELISA (SPCE)	Brunei: None.	NSP ELISA is sufficient and reliable for screening of FMD in FMD-free zone country.	NA
	China: Newly developed SPCE kits for type A and O	Achieved	
Synergise resources from other diagnostic units e.g. HPAI to improve capacity of FMD diagnosis.	Brunei: Use of same HPAI facilities for development of FMD molecular testing (still in progress).		
	China: The centre for diagnosis and testing includes diagnosis for different animal diseases in LVRI	Mainly within the Institute	
Sharing of information/report	Brunei: FMD serosurveillance report is submitted bi-annually to OIE through WAHIS portal.	FMD laboratory result is disseminated to Animal Health and Disease Control Unit for epidemiological monitoring and report to OIE.	NA
	China: Share sequences of isolates from China With S. Korea and WRL FMD	Limited	Regulations from different countries , need to approve from the authority
PVM program for monitoring herd immunity in vaccinating countries	Brunei: None.	Brunei maintains the status of FMD-free country without vaccination.	NA
	China: Annual Programme in place	Achieved and on-going	

2017 LabNet Recommendations	Progress	Remarks	Constraints (technical) in implementing the recommendation
Improve sample collection and submission	<p>-Province officer should collected samples and submitted to laboratory belonging to guideline of sample collection.</p> <p>- In the future, RRL will pick up the sample at Animal quarantine at border country as following member country requested to testing. (On going to continue process)</p>		Technique and correct understanding
Use of molecular techniques to complement ELISA based assay.	Laboratory usually have used the molecular techniques to complement ELISA base assay but should optimized the proper the right way. That can be continue to sequencing information.		Facility and proficiency of the testing
Explore the use of Solid-Phase Competition ELISA (SPCE)	In 2008, RRL ever had compare with routine test but currently, RRL does not perform this test. Possibly, that include for choice testing in the laboratory		
Synergise resources from other diagnostic units e.g. HPAI to improve capacity of FMD diagnosis.	RRL did not synergized from other diagnostic units. Any way RRL have maintained the IQC of the test for QA in the laboratory. That should be do this because that can be apply and improve FMD diagnosis.		Collaboration
Sharing of information/report	Report have to distribute to DLD and regional sender in the country and Coordinator person that would be report to WAHIS website. That should be sharing but asking the sender to accept this sharing before.		
PVM program for monitoring herd immunity in vaccinating countries	RRL have tested by 3ABC and LP ELISA for PVM program every vaccine round		Connect and collaboration each other in the organization

Laboratory Network (2019) Diagnostic Tests for FMD

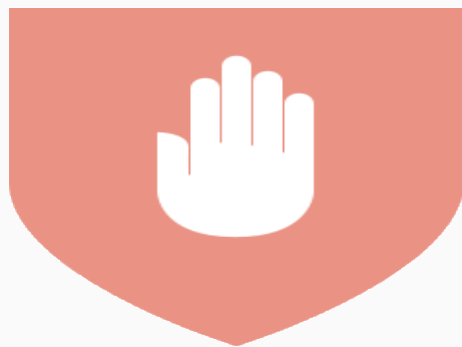


Tests	SEACFMD Campaign Member Countries											
	Brunei	Cambodia	China (Lanzhou)	Indonesia	Lao PDR	Malaysia	Myanmar	Mongolia	Philippines	Singapore	Thailand	Vietnam
1. ELISA												
• Indirect (Ag detection)		√	√		√	√	√	√	√	√		√
• LPBE		√	√	√	√	√	√	√	√	√	√	√
• NSPE	√	√	√	√	√	√	√	√	√	√	√	√
• SPCE			√		√		√			√		
• MABE								√ (research)				
2.VNT			√			√		√				√
3. IHA								√				
3. Virus Isolation			√					√			√	√
• BTY cells								√ (ZZR-127)				
• BHK cells						√	√	√ (IBRS-2)				√
• LFBK cells								√ (LPBK)				√
• PK cells												
• MDCK cells								√				
4.Molecular Diagnosis						√		√				
• Real time PCR		√	√	√	√		√	√	√	√	√	√
• Multi-RT PCR			√			√		√				
• Sequencing VP1			√	√				√		√	√	√
• Full Genome			√ (research)					√ (research)		√		



Way Forward...

- Harmonization of Molecular Protocol in the region
- Harmonization of FMD Diagnosis algorithm with serological and molecular assays
- PT for both tests
- Encourage active sharing of information between labs in the region
- Submission of representative outbreak samples to reference labs.
- Research collaboration in the region.



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12th SEACFMD LabNet
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