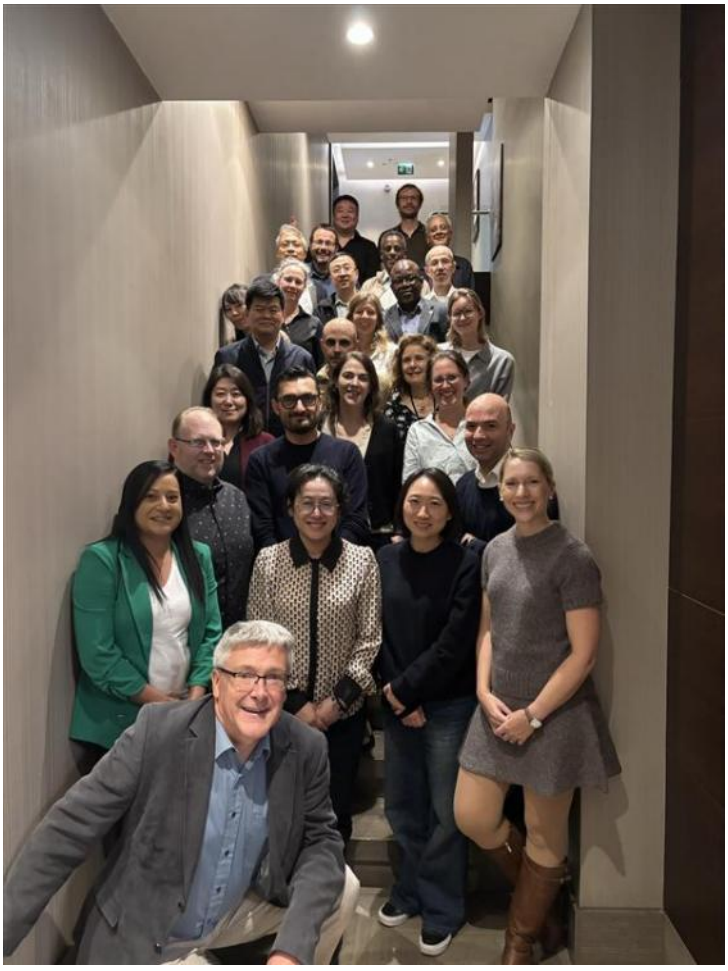
WOAH/FAO
Foot-and-Mouth Disease
Reference Laboratories
Network

The 20th Annual Meeting of the

WOAH/FAO FMD Reference Laboratory Network

23th-24th October 2025

Hosted by: ŞAP Institute, Türkiye



Core Members

	WOAH Reference Laboratory for FMD, Dirección de Laboratorio Animal, SENASA, Argentina Speaker: Sabrina Galdo Novo
	WOAH collaborating Centre for validation, quality assessment and quality control of diagnostic assays and vaccine testing for vesicular diseases in Europe, and FAO Reference Centre for Vesicular Diseases Sciensano, Belgium Speaker: David Lefebvre Participants: Anne-Sophie Bultinck
	WOAH Reference Laboratory for FMD; Botswana Vaccine Institute (BVI), Botswana Speaker: Elliot Fana
	Centro Panamericano de Fiebre Aftosa (PANAFTOSA) and PAHO /WOAH Reference Laboratory for FMD, Brazil Speaker: Edviges Maristela Pituco; Participants: Euclides José De La Torre Medrandra
	WOAH/FAO FMD Reference Laboratory, National Centre for Foreign Animal Disease, Canadian Food Inspection Agency, Canada Speaker: Shawn Babiuk
	WOAH and China National FMD Reference Laboratory, Lanzhou Veterinary Research Institute (LVRI), CAAS, People's Republic of China Speaker: Wen Dang, Haixue Zheng; Participant: Jijun He, Zixiang Zhu
	WOAH/FAO FMD Reference Laboratory, French Agency for Food, Environmental and Occupational Health & Safety (ANSES), France Speaker: Guillaume Girault, Participants: Sandra Blaise-Boisseau
	FAO Reference Centre for FMD in South Asia, Indian Council for Agricultural Research, National Institute of FMD (NIFMD), Bubaneswar, India Speaker: Rabindra Prasad Singh
	WOAH/FAO FMD Reference Laboratory, Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna (IZSLER), Italy Speaker: Santina Grazioli; Participant: Tiziana Trogu, Efrem Foglia
	Diagnosis and Control of Animal Diseases and Related Veterinary Product Assessment in Asia, National Institute of Animal Health (NIAH), Japan Speaker: Katsuhiko Fukai; Participant: Rie Kawaguchi
	WOAH Reference laboratory for FMD, Animal and Plant Quarantine Agency (APQA), Republic of Korea Speaker: Su-Mi Kim; Participants: Soyoon Ryoo
	FAO FMD Reference Laboratory, Wageningen Bioveterinary Research, The Netherlands Speaker: Phaedra Eble; Participants Aldo Dekker
	FAO Reference Centre for FMD for Central Asia and West Eurasia and WOAH Reference Laboratory for FMD, Federal Governmental Institute, Centre for Animal Health (FGI ARRIAH), Russian Federation Speaker: Viktor Nikiforov
	FAO Reference Laboratory for FMD in Africa and WOAH FMD Reference Laboratory, Transboundary Animal Diseases Programme, ARC-Onderstepoort Veterinary Institute (ARC-OVI), South Africa Speaker: Melanie Chitray

	Regional Reference Lab for FMD in SouthEast Asia, Pakchong, Thailand Speaker: Kingkarn Boonsuya Seeyo
	FAO World Reference Laboratory (WRLFMD) and WOAH Reference Laboratory for FMD The Pirbright Institute, United Kingdom Speakers: Donald King, Anna Ludi, Antonello Di Nardo; Participant: Andrew Shaw
	WOAH FMD Reference Laboratory, Foreign Animal Disease Diagnostic Lab, Plum Island Animal Disease Center (PIADC), United States of America Speaker: Vivian O'Donnell; Participants: Amanada Kortum

Affiliates

	Australian Centre for Disease Preparedness (ACDP), Australia Speaker: Wilna Vosloo
	Animal Health Institute (AHI), Ethiopia Speaker: Daniel Gizaw
	National Veterinary Research Institute, Plateau State, Nigeria Speaker: David Ehizibolo
	Şap Institute (and WELNET FMD), Türkiye Speaker: Can Cokcaliska

WOAH/FAO Representatives

eufmd	The European Commission for the Control for Foot-and-Mouth Disease Speaker: Fabrizio Rosso Participants: Shahin Baiomy
	Food and Agriculture Organization of the United Nations Speakers: Nick Lyons Participants: Artem Metlin
World Organisation for Animal Health	WOAH – World Organisation for Animal Health Speakers: Min-Kyung Park
	Armenia: West Eurasia EPINET Participant: Satenik Kharatyan

Vaccine Producers

Boehringer Ingelheim	Boehringer-Ingelheim, VPH Veterinary Public Health Speaker: Pascal Hudelet Participants: Amélie Poulard
Biogénesis Bagó	Biogénesis-Bagó Participants: Romina Scian and Sabrina Cardillo
MERCK Animal Health	MSD, MERCK Participants: Chriche du Plessis
Dollvet	Dollvet Participants: Sinan Aktas and Yaser Vezir

Observers

	Friedrich Loeffler Institute (FLI), German Participant: Michael Eschbaumer
	Labib Bakkali Kassimi
	Lab MENET Ahmed R. Habashi

Apologies received from: FMD Reference Laboratory, Embakasi, Kenya and Laboratoire National d'Elevage et de Recherches Vétérinaires (LNERV), Senegal

DAY 1: THURSDAY 23rd OCTOBER

1. Opening Remarks (Dr Donald King)

- Dr King warmly welcomed colleagues to the 20th meeting of the WOAH/FAO Reference Laboratory Network for FMD. This annual meeting brings together representatives from all of the global WOAH and FAO FMD reference laboratories and other regional-leading reference laboratories in Africa and Asia, providing an opportunity to review data from recent FMD outbreaks to help understand emerging patterns of risk.
- This year's meeting is being run back-to-back with the GFRA meeting (https://insights.crdfglobal.org/gfra2025) with delegates attending and contributing to the meeting via in-person and virtual formats. It was noted that an overview of current global FMD risks was presented by the WRLFMD on day one of the GFRA meeting and a brief introduction to the history and work of the Network was also provided to the wider FMD community in the plenary Epidemiology session.
- Since this meeting is shorter than those in the past, the focus was on concise updates from the partners to highlight new data (surveillance data, virus characterisation, and vaccine performance insights) that can be used to contribute to an understanding of global FMD epidemiological patterns. These outputs provide evidence that is used to support global control strategy.
- The meeting agenda was adopted by the delegates
- Dr King thanked the sponsors (Biogenesis Bago, Boehringer Ingelheim, MSD and Dollvet) for their support to the meeting.

2. Updates from GF-TADs, WOAH, FAO and EuFMD

2.1 GF-TADs FMD Working Group (Dr Min-Kyung Park)

- The global Framework for the progressive control of transboundary animal diseases (GF-TADs), is a joint WOAH/FAO initiative that has a vision to reduce the threat of TADs through multi-stakeholder cooperation.
- The presentation from Dr Park briefly described work from the GF-TADs FMD Working Group to update the Global FMD Control Strategy published in 2012 to provide a vision for activities encompassing 2027–2042 (due to be launched in 2027).
- The objectives are designed to develop an inclusive, evidence-based and strategy that is aligned to the other TADs frameworks.
- Other regional control programs such as SEACFMD (and other regional road maps) have also recently updated their workplans and there is now scope to more closely link these regional control initiatives together.
- The FMD Progressive Control Plan (PCP) is still relevant with >80 countries engaged and using the tool, but a review of data shows that many countries find it difficult to progress beyond PCT Stage 2. Recognising this, the Working Group is considering options to define additional "sub-steps" that might help countries demonstrate progress from PCP Stage 2 to PCP Stage 3.

2.2 FAO update (Dr Nick Lyons)

- Dr Lyons described work to strengthen regional FMD control strategies in East Africa, West Asia and West Africa to bridge between global and national strategies.
- FAO has developed a range of tools/platforms to support these activities: regional virtual learning centres, PCP Hub, FAO Laboratory Mapping Tool enhanced for FMD-specific assessment.
- A recent focus of this work has been to monitor the emergence and spread of the SAT-1 serotype in West Asia, to provide guidance on vaccine availability, and assistance to coordinate responses in the West Asia and West Eurasia. FAO have recently published "alerts" to raise awareness to countries about these SAT 1 outbreaks (https://www.fao.org/newsroom/detail/fao-warns--enhanced-awareness-and-action-needed-amid-foot-and-mouth-disease-outbreaks-in-europe-and-the-near-east/) and have also prepared a rapid risk assessment (https://www.fao.org/animal-health/rapid-risk-assessment-fmd/en) that can be used by countries to help them prepare for further spread of this exotic serotype in the region.

2.3 EuFMD update (Dr Fabrizio Rosso)

- The presentation from Dr Rosso highlighted the wide range of activities that EuFMD undertake to support FMD surveillance and control. He briefly described the work to develop the new FMD dashboards (OpenFMD), support of sample shipments to WOAH/FAO Reference Laboratories, and initiatives to enhance diagnostic testing and demonstrate laboratory equivalence via proficiency testing schemes organised by ANSES and the WRLFMD.
- EuFMD continues to contribute to the PCP via participation in regional roadmap meetings and development of a PCP and PCP dashboard hub as well as support for a PCP/social-economic analysis workshop (for Armenia, Azerbaijan and Jordan).
- Outside of Europe, EuFMD provides support to countries in North Africa, West Asia via risk information sharing, training, and vaccine advisory groups.

2.4 WOAH (Dr Min-Kyung Park)

- Dr Park thanked the Network partners for their work to update the FMD Chapter of the WOAH Terrestrial Manual. The revised text now includes updated protocols used for virus isolation, ELISA, LFD and VNT and removal of the sections relating to the use of the complement fixation test (CFT). Additional points to emphasise the importance of adopting diagnostic tools for differential diagnosis of Seneca Valey virus for samples arising from pigs are also included. The revised text was adopted by the WOAH General Session in May 2025.
- The FMD Chapter in the WOAH Code was also updated in 2024.
- Dr Park also provided a brief overview of the WOAH system that is used to document the official FMD status of a country and territory. She also gave an update in changes to the Official WOAH status that have occurred during 2025):
    - *FMD-Free without vaccination:* Bolivia (whole territory), Brazil (whole territory), Argentina (four zones FMD free with and without vaccination).
    - *FMD-Free with vaccination:* Russia (zone), Republic of Korea (Jeju Island).
    - *Control programme endorsed:* Mongolia.
- During 2025, FMD outbreaks in Europe led to a suspension in the FMD free status in three countries. The FMD-free status has now been recovered: Germany (reinstated in 95 days)

and Hungary (reinstated in 191 days) and Slovakia. FMD outbreaks (serotype SAT 2) have led to a suspension of the FMD free status in Eswatini.

2.5. Opening session – discussion topics

- A proposal was discussed to review PCP criteria to capture progress *within* stages, not only between them, with perhaps an opportunity to reflect on what has worked for South America and Europe.
- Suggestion to publish "lessons learned" from the GFTADs FMD 2012–2027 strategy.

3.0. Brief Summary of Laboratory Updates

3.1 Pool 1 – Thailand (Dr Kingkarn Boonsuya Seeyo)

- Surprisingly, no clinical cases of FMD have been detected so far in 2025. However, based on profiles from previous years, it is likely that there will be an increase in outbreaks towards the end of the year.
- The last time serotype A was detected in Thailand was in 2022
- Surveillance activities in Thailand have led to the collection of probang samples, where FMD viruses have been detected (sequences to be confirmed).
- Serosurveillance for FMD-specific antibodies in the country now includes testing for serotype SAT 2, but no animals with serotype SAT 2 antibodies have been detected to date. Dr Kingkarn Boonsuya Seeyo explained that this is new policy that is mandated the Thai government due to uncertainty about the risks of this serotype being introduced into the country. It was noted that China now has a similar policy for surveillance of all imports of cattle/sheep from areas with SAT2 outbreaks.

3.2 Pool 1 – China (Dr Wen Dang)

- Dr Wen Dang described three FMD outbreaks that have occurred in during 2025 (all in Xinjiang Province, China). These cases were in cattle and were found to be due to the O/ME-SA/Ind-2001e lineage.
- There were also three outbreaks in 2024, two in cattle due to O/ME-SA/Ind-2001e, while an outbreak in pigs was due to the O/CATHAY.
- Active surveillance activities in pigs have collected 2071 samples, of which 83 were positive for FMDV RNA by RT-PCR. Sequencing of these samples detected O/CATHAY (n=53) and O/ME-SA/Ind-2001e (n=30).
- O/SEA/Mya-98 last detected in 2021 but is thought to still be circulating in China, the last time serotype A was detected was in 2019.
- The current O-type vaccines appear to be poorly matched to field viruses from the O/CATHAY topotype; findings that have been recently verified by an *in-vivo* study.
- Chinese teams are developing a new recombinant vaccine candidate called O-KC, which has generated encouraging protective responses
- Peptide vaccines are still available for pigs, but these vaccines are not being widely used in China.

ACTION 25-01: Colleagues at LVRI to request permission from the Chinese authorities to share sequences recovered from field outbreaks and surveillance projects with the Network.

3.3 Pool 1 – The Republic of Korea (Dr Su-Mi Kim)

- Dr Kim's presentation described new FMD outbreaks that have been detected during 2025 in Jeollanam-do Province after two years without any cases in South Korea. The first case occurred on a cattle farm in Yeongam County on 14th March 2025, after which further cases were detected on 12 further cattle farms in Yeongam County and six farms (1 cattle and 5 pig) in Muan County. Movement restrictions were maintained from 14th March – 8th July. Sequence analysis has identified the causative viruses as those from the O/ME-SA/Ind-2001e lineage, where phylogenetic comparisons support a new introduction of FMDV from overseas
- Vaccination coverage in South Korea is estimated at > 90 % in cattle, pigs, goats.
- This presentation also highlighted results from recent collaborations with other countries in Asia (Bangladesh, Cambodia, Laos PDR, Mongolia, Vietnam). Sequences collected from samples submitted from these countries provide evidence for circulation of a diverse range of serotype O lineages: O/ME-SA/Ind-2001e (all), O/ME-SA/PanAsia (Laos, Vietnam), O/ME-SA/SA-2018 (Bangladesh), O/SEA/Mya-98 (Vietnam). Notably, 14/19 samples from Bangladesh were characterised as belonging to the O/ME-SA/SA-2018 lineage; highlighting the dominance of this lineage in South Asia (Pool 2) and its threats for introduction into countries in Southeast Asia (Pool1).

3.4 Pool 1 - Japan (Dr Katushiko Fukai)

- Dr. Don King introduced the Kodaira Research Station, at the National Institute of Animal Health (NIAH) in Japan. This Institute is a WOAH Collaborating Centre "Diagnosis and Control of Animal Diseases and Related Veterinary Product Assessment in Asia" actively involved in FMD surveillance in several countries in South-East Asia. Network partners were invited to respond to a proposal from WRLFMD that NIAH, Japan should be invited to join the Network; all responses were supportive and there were no objections.

AGREEMENT: NIAH, Japan to be asked to sign the Memorandum of Understanding to formally join the Network as a WOAH Collaborating Center.

- The presentation from Dr Fukai described results from studies to sequence FMD viruses collected from Myanmar (n=16) and Thailand (n=12). All sequences belonged to the O/ME-SA/Ind-2001e lineage, consistent with regional strains.

3.5 Pool 1 - Russia (Dr Viktor Nikiforov)

- No new FMD outbreaks have been detected in Russia during 2025.
- A risk assessment highlights the continued threats of virus introduction posed by the O/ME-SA/Ind-2001e lineage (primarily from Pool 1), as well as the increased potential for virus incursions of the SAT1/I and SAT2/XIV topotypes from Pool 3
- Serological monitoring in vaccinated and unvaccinated zones has continued

- Dr Nikiforov also described the results for bovine serum samples collected from Pakistan (post-vaccination) which demonstrated 100% antibody positivity for serotypes O, A and Asia 1 (by LPBE and VNT).
- CIS-wide coordination continues under the 2025 Action Plan; 2026–2030 plan approved in September 2025.
- Interlaboratory Comparison Tests (ILC) for FMD were conducted for 10 veterinary laboratories from 8 countries: Uzbekistan, Tajikistan, Armenia, Belarus, Kazakhstan (2 laboratories), Kyrgyzstan (2 laboratories), Moldova, and Mongolia. The testing was completed successfully, and reports have been prepared for the participating countries.

3.6 Pool 2 - India (Dr Rabindra Prasad Singh)

- Dr Singh's presentation highlighted a decline in the number of reported outbreaks in India during 2025. For example, during 2024, 242 serotype O, 31 serotype A outbreaks were recorded, in comparison to only 55 serotype O, 5 serotype A in so far in 2025. There have been no FMD outbreaks recorded in the southern peninsula of India during 2025, despite strong surveillance for the disease
- There have been no serotype Asia 1 outbreaks recorded in India since 2023.
- The reduction in clinical outbreaks coincides with data from serological surveillance that demonstrates a reduction in NSP antibody prevalence across the national cattle herd (8.8% positive in 2025 compared to 13.9% positive in 2024). Sentinal surveillance in small ruminants that are not typically vaccinated was initiated in 2024, where data also shows a decline in FMDV-antibody positivity.
- All serotype O viruses characterised during 2025 have belonged to the O/ME-SA/SA-2018 lineage. Serotype A outbreaks are from the A/G-VII (G-18/non-deletion/2019) lineage
- Vaccine matching: continues to be good for serotype O. Antigenic data for serotype A highlights the need to replace the vaccine strain with a more closely matched virus.
- The risks of FMD incursion into India due to exotic FMDV lineages have been emphasized by testing of trade-related samples which have yielded RT-PCR FMDV results including two consignments from Saudi Arabia.

3.7 Pool 3 - Türkiye (Dr Can Çokçalişkan)

- The presentation from Türkiye highlighted increased laboratory activity during 2025 with >1000 samples analysed in since the beginning of the year. FMDV positive samples from Türkiye represent serotype O (n=221), serotype A (n=4), serotype SAT 1 (n=478) and serotype SAT 2 (n=92).
- SAT1/I was first detected May 2025 in Hakkari Province; outbreaks then spread during the sacrifice festival (Eid al-ahda) due to animal movements. Sequences recovered from these SAT 1 outbreaks are closely linked to the sequences determined for Iraqi (and Bahraini) isolates.
- Cases due to the SAT2/XIV topotype appear to be waning with no outbreaks detected in the country for the last two months.
- Serotype O viruses sequenced during 2025 encompass the endemic O/ME-SA/PanAsia$^{ANT-10/PUN-16}$ lineage and the O/ME-SA/SA-18 that has recently emerged from Pool 2. For serotype O, vaccine matching for five isolates shows that the OTUR-07 and O1 Manisa vaccine strains are matched but not the OTUR 24 vaccine.
- Serotype A virus collected in Igdir represent the A/ASIA/Iran-05^{FAR-11} sublineage.

- The SAP FMD Institute has also provided assistance to test samples from outbreaks in neighbouring countries (Iraq [n=6] and Syria [n=20]).
- The Thrace region of Türkiye remains FMD-free with vaccination where NSP surveillance has tested 26,132 sera. NSP surveillance has also been undertaken for animals moved to temporary animal markets in Istanbul (n=35,409)
- Discussion after the presentation highlighted a need to improve the cross-border data sharing between Türkiye, Iraq and Iran.

ACTION 25-02: Dr Abdulnaci Bulut is requested to comment on the coverage of the vaccination campaign for SAT 1 in the Thrace region.

3.8 Pool 4 - Ethiopia (Dr Daniel Gizaw)

- During 2025, 18 outbreaks of FMD have been reported in Ethiopia.
- Samples (n=117) have been submitted to AHI from field cases in Ethiopia. Ag-ELISA has been used to detect serotype O (n=48) and serotype A (n=2). These samples will be sent to WRLFMD for full characterisation.
- Previously, SAT2/XIV was dominant in the country; however, samples collected during 2025 indicate that serotype O is now dominant.
- NSP serosurveillance has been undertaken in cattle where 2050/2500 (82%) of sera were positive for FMDV-specific antibodies
- Serotype SAT1 was last detected in 2007.

3.9 Pool 5 - Nigeria (Dr David Ehizibolo)

- Sequencing for samples collected in 2024 confirms circulation of O/EA-3, A/AFRICA/G-IV and SAT2/VII lineages in Nigeria consistent with prior years.
- Vaccine matching data (generated at WRLFMD) was presented for Nigerian serotype O and SAT 2 field isolates for international FMD vaccines from Biogenesis Bago, Boehringer Ingelheim and MSD.
- A small NSP serosurvey has been undertaken yielding 154/378 (40.7%) positive results.
- There are unconfirmed reports of SAT 1 detection in Ghana which are under investigation since the last SAT1 (SAT1/X) cases detected in West Africa were in 2016. It is unclear if this unofficial report was derived from antigen ELISA results where cross-reactivity with other FMDV serotypes may be a concern. Sequences are urgently required to confirm these findings.
- Continued concern about regional spread of SAT2 as Niger has stated they have SAT2/V (presentation in Tunisia).

ACTION 25-03: WRLFMD and NVRI to contact Ghana and Niger to request further information on the unofficial SAT1 and SAT2 outbreaks.

3.10 Pool 6 - Southern Africa (Dr Elliot Fana)

- Dr Fana presented the results for 476 samples received from Botswana and neighbouring countries in Southern Africa during 2025. Samples from Botswana and Namibia were FMDV negative, while serotype SAT 2 was detected in samples from Eswatini and

Zimbabwe. Sequencing of these FMDV-positive samples is planned but has been delayed.

- A small number of samples collected for surveillance purposes have also been analysed using VNT and NSP ELISA. Positive FMDV-antibody results were obtained for 5/6 sera collected from Namibia, while 3 sera from Eswatini were FMDV-antibody negative.
- Vaccine matching using VNT shows that isolates from Eswatini and Zimbabwe collected in 2025 are matched to the SAT251 vaccine from BVI (additional matched data was presented for the Zimbabwe isolate for the SAT 2035 vaccine strain).
- No epidemiological changes observed, but continued vigilance for FMD recommended in southern Botswana due to regional risks.

3.11 Pool 6 - South Africa (Dr Melanie Chitray)

- Dr Chitray described the wide range of laboratory testing activities that have occurred during the first part of 2025 due to the on-going FMD outbreaks in South Africa (NB: data presented only covered the period from Jan-Mar 2025).
- More than 200 FMD outbreaks in South Africa have involved serotypes SAT 1(KwaZulu-Natal) and SAT 2 (five provinces: KwaZulu-Natal, Mpumalanga, Gauteng, North West and Free State). Active surveillance is also underway in two provinces (Northern Cape and Western Cape) where FMD has not been detected, while earlier outbreaks due to serotype SAT 3 in Limpopo (2021) and Eastern Cape (2024) are now resolved.
- The presentation covered molecular analyses of SAT 2 viruses collected during 2025. Sequences recovered from outbreaks highlight a close relationship between SAT 2 viruses recovered from the affected provinces and outbreaks in KwaZulu-Natal (which is now the largest outbreak cluster).
- OVI trivalent (SAT 1, 2, 3) vaccine undergoing safety and field evaluation; initial results are good. Large-scale production of this vaccine expected by March 2026, pending facility approval.

ACTION 25-04: All to gather intelligence on what is happening in Lesotho.

3.12 North Africa Update – Italy (Dr Santina Grazioli)

- Dr Grazioli describe results for samples received from Libya (collected near Tripoli, Feb 2025). This sample batch included tissues (epithelia and heart), FTA cards prepared from blood and epithelia and sera. 3/9 tissues and the FTA cards were positive by real-time RT-PCR (3D and O/EA-3).
- VP1 sequencing confirmed the presence of the O/EA-3 topotype, with sequences most closely related to those collected in Libya (2023/24) and more distantly related to sequences from Egypt and Ethiopia. These data provide evidence for multiple incursions into Libya of FMD viruses from the O/EA-3 topotype since 2019.
- Sera were positive (70%) for NSP and serotype O – consistent with infection with this serotype
- IZSLER are not aware of any recent data from Algeria or Tunisia, but ANSES have new samples under analyses that will be include in the final report.

3.13. Pool 7 - South America Update (Dr Euclides José de la Torre Medranda y Edviges Maristela Pituco

- South America has been FMD-free for 7 years (outside of Venezuela); no positive FMDV samples received.
- Ongoing support to national labs for vesicular disease differential diagnosis (Seneca Valley virus, vesicular stomatitis).
- Hemispheric Program for the Eradiation of Foot-and-Mouth Disease (PHEFA) Plan 2026–2030: aims to maintain continental FMD-free status; Venezuela remains the only non-free country.
- The presentation highlighted the Regional Bank of Antigens and Vaccines against Foot-and-Mouth Disease (BANVACO) with Ecuador, Paraguay, and Brazil as its founding members that was established in August 2025. The initiative remains open to the participation of other countries at any time. The Regional Bank's core mission is to: ensure the availability of safe vaccines, internationally certified for quality; provide technical cooperation to member states, strengthening preparedness for health emergencies; foster regional initiatives guided by solidarity and collective strategy; secure economies of scale and transparent negotiations with vaccine suppliers facilitated through the Pan American Health Organization (PAHO).

3.14 North America Update (Dr Vivian O'Donnell)

- Dr O'Donnell described results for samples received from two west Africa countries. Samples collected from Ghana represent serotype O (11 samples) and serotype SAT 2 (one sample), while RT-PCR has generated positive results for 10 samples from Nigeria. Molecular analysis including complete genome sequencing is ongoing
- Vaccine potency testing has been conducted for antigens held by the North American FMD Vaccine Bank.

3.15. Europe update (Dr Guillaume Girault)

- The EU-RL (ANSES, France) has provided support to EU Member States during the FMD incursions during 2025. These events represent two separate introductions of the virus into continental Europe for the first time since 2011: (i) the first in January causing a single outbreak in water buffalo due to the O/ME-SA/SA-2018 lineage and (ii) the second starting in March involving Hungary and Slovakia, where there have been 11 outbreaks due to the O/ME-SA/PanAsia-2$^{\text{ANT-10 (or PUN-16)}}$ lineage.
- Sequences highlight a likely origin for both of these incursions as Western Asia (Pool 3). Full genome sequences have been used to reconstruct the virus order in which farms in Hungary and Slovakia were infected and highlight several trans-border virus transmission events.
- Samples have also been submitted from Türkiye documenting the circulation of serotypes O, A, SAT 1 and SAT 2.
- Vaccine matching data generated by ANSES has been used to help select appropriate vaccines for these outbreaks in Europe.

3.16. Canada update (Dr Shawn Babiuk)

- Sequencing of FMDV positive samples collected from Nigerian samples (collected 2017-2020) highlights the presence of O/EA-3, A/AFRICA/IV and SAT2/VII lineages.

DAY 2: FRIDAY 24th OCTOBER

4. Review of FMD Lineage Prevalence (Endemic Pools 1–7)

Meeting participants were invited to contribute to a review of the regional lineage risks. An updated table of these risks is shown below:

Table 1: Proposed changes to the lineage distribution scores for the endemic pools

Lineage	South-east / Central / East Asia [Pool 1]	South Asia [Pool 2]	West Eurasia & West Asia [Pool 3]	North Africa	Eastern Africa* [Pool 4]	West / Central Africa [Pool 5]	Southern Africa [Pool 6]	South America [Pool 7]
O/ME-SA PanAsia-2			25					
O/ME-SA PanAsia	10							
O/SEA Mya-98	15							
O/ME-SA Ind2001	43	21	3	0				
O/ME-SA/SA-2018		61	13					
O/EA			1	58	62.5	60	16	
O/WA						0		
O/EURO-SA								90
O/CATHAY	17							
A/ASIA Sea-97	15							
A/ASIA Iran-05	0	0	20					
A/ASIA G-VII		15	0					
A /AFRICA				24	12	15		
A/EURO-SA				2				10
Asia1	0	3	5					
SAT 1			21	4	15	1	8	
SAT 2			12	12	10	24	57	
SAT 3					0.5		19	
C								

Note: For each of the regions, data represent the relative importance of each viral lineage (prevalence score estimated as a percentage [percent] of total FMD cases that occur in domesticated hosts). Changes to increase risks are shown in **red**, while a reduction in risk is shown in **green**. * Pending report from the FMD Reference Laboratory, Kenya

- The experts recognised the value to undertaking regular regional risk assessments but acknowledged that the current approach to refine these values could be improved – perhaps using a structured expert elicitation model according to the criteria below:
    - Experts submit individual assessments (min–most likely–max estimates) online ahead of the Network meeting.
    - Aggregated data statistically summarized for consensus.
- EuFMD agreed to explore whether a simple online tool (i.e., MentiMeter) could be established to support this exercise.

5. OpenFMD Platform and PRAGMATIST Updates (Dr Antonello Di Nardo, WRLFMD)

- Dr Di Nardo gave an overview of the OpenFMD platform (launched in April 2024) and now includes:
    - **FMDWatch** for surveillance, where there have been new developments to allow full access to vaccine matching (VM) data from WRLFMD (r_1-values, neutralisation titres) and statistical distribution of VM data over time to help understand antigenic evolution.
    - **FMDnext** (based on NextStrain) which will hopefully be ready by the end of 2025
    - **FMDbase** the FMDV sequence database which will adopt a new user registration process with updated T&C. early in 2026.
    - Update on vaccine recommendations based on new **PRAGMATIST** application.
    - **OpenFMD** will also incorporate a new web form developed to simplify submission of new FMD information from laboratories: including diagnostic, serology, and sequencing data. It is proposed that laboratories could submit data which will be curated and uploaded into FMDbase
- Improving reporting
    - FMDtype and FMDwatch to feed global surveillance information into the annual report of the WOAH/FAO ref lab Network for FMD.
    - Reference laboratory reports to be uploaded directly (similar to what is currently being done by WOAH Reference Laboratories for their Annual Reports).

6. Review of Terrestrial Manual – Potency Test Harmonisation

- Dr Donald King led discussions on previous inconsistencies between the PD50 and PPG/PGP potency test endpoints in the WOAH Terrestrial Manual. These texts were not aligned since the PGP method (Section 5.3.2) described unprotected animals as those that "show lesions on the feet within 7 days after inoculation", while the PD50 method defined non-protected animals as those that "show lesions at sites other than the tongue". A survey of 22 laboratories conducted in 2023 showed 64.7% (11/17) of respondents used foot lesions only, while a minority also considered oral/nasal lesions to define non-protected cattle. Together with expert opinion, these responses were used to prepare a modified and harmonised statement in the WOAH manual to state that only vesicular lesions on the feet should be used to define a non-protection animal for both FMD potency methods; oral/nasal lesions are excluded. The harmonised text was approved by the Biological Standards Commission and incorporated into an updated version of the Terrestrial Manual that was adopted by the WOAH GS in May 2025.
- The new text removes the inconsistency that previously existed between the endpoints used for PD50 and PPG/PGP studies. However, opposition to the revised text was received by the Chinese delegation. Therefore, colleagues from LVRI were invited to provide evidence that could be considered to further adjust the text; recognising that (i) further revision will need consensus between the WOAH experts, (ii) that there is clear scientific justification to ensure that the end-points for the PD50 and PPG/PGP texts are the same and (iii) that changes to the text will need to be accommodated within the regular updates to the WOAH manual.

ACTION 25-05 (ALL): Laboratories to collect data on when lesions are seen on teats (or any other side), but not the feet?

ACTION 25-06: Colleagues from Lanzhou to pull together data on when lesions are seen on the nose but nowhere else.

ACTION 25-07 (ALL): Laboratories which hold local/national pharmacopeia texts, please bring this information to the next meeting

- **7. Revision of the FMD Chapter of the WOAH Manual– Vaccine Section**

    - The Network partners were thanked for their help to prepare updated text for the WOAH Terrestrial Manual, which for this cycle focussed on a series of appendices that describe the use of different diagnostic tests for different purposes.
    - The next section of the WOAH Terrestrial Manual is to update the vaccine section.
    - Target date for draft submission: June–July 2026.
    - Vaccine manufacturers (including MSD, Boehringer Ingelheim, Biogénesis-Bagó, DOLLVET) will be invited to provide their views on points that require revision.
    - Objective: harmonise the content and avoid duplication with Manual chapters that consider overarching issues relating to vaccines and their use (see section 2.3 of the Manual).

ACTION 25-08: Updated appendices to be circulated to all members for comments.

ACTION 25-09: Dr Don King to distribute Word versions to members for input on sections to be reviewed. A follow-up meeting will be scheduled in the New Year to consider the consolidated feedback.

8. Role of Reference Laboratories to evaluate commercial vaccines

- There is an increasing interest in studies that assess the performance of FMD vaccines. This work often includes serological testing of sera that has been collected after vaccination with a commercial product. Using laboratories in the Network should provide a degree of independence in the testing – providing confidence to the customers that the results reflect the responses that should be expected if the vaccine is purchased.
- In this joint presentation by Boehringer Ingelheim (Dr Pascal Hudelet), Biogénesis Bagó (Dr Romina Scian), Dollvet (Dr Sinan Aktas) and MSD (Dr Chriche du Plessis) the issues of transparency, impartiality, and harmonisation in vaccine evaluation were discussed:
    - How can the ref labs reduce the perceived or actual biases in these analyses?
    - How can reference laboratories be confident that the companies provide truly representative sera for these analyses? – i.e., should test results make it clearer that certain sera are provided from the company (or from studies under their supervision), while other sera can come to reference laboratories from studies where company has no influence?
    - How should these data be presented?
- Key Recommendations for PVM studies:
    - Where possible, BVS should be produced by independent laboratories, funded by manufacturers. These sera should use commercial batches of vaccines representative of the products that are provided to customers. Recognising that this is often not currently possible, the provenance of these sera should be clearly described in the reports/presentations arsing for the testing of FMD vaccines.

- Make raw BVS data (animal data, day-0 serology, batch records, vaccination protocol) available and auditable.
- Make adjustments to the WOAH Terrestrial Manual to stress that heterologous neutralisation titres should also be reported when considering vaccine responses (currently focuses only on r_1-values).
- Work with the Network could assist to calibrate the VNT and ELISA approaches used to measure FMDV-specific antibodies. Increased (and harmonised) capacity in this area would allow additional laboratories to contribute data to the selection of appropriate FMD vaccines
- The companies endorsed the concept of regional antigen panels to allow post-vaccination sera to be tested against relevant virus risks. In this context there was a suggestion to consider creating a "regional vaccine testing report."
- WRLFMD quarterly (Vaccine Matching) reports should include only results generated by WRLFMD using monovalent BVS and homologous vaccine strains from manufacturers.

ACTION 25-10: AL/WRLFMD to put together a short document highlighting the above and circulate for comment.

ACTION 25-11: Discussion paper to be drafted for next meeting on whether the standard should move from $3PD_{50}$ to $6PD_{50}$ with more focus on efficacy; led by Drs Aldo Dekker, Sabrina Galdo and Wilna Vosloo.

9. Nagoya Protocol – Updates and Implications

- Dr Don King provided an update on the Nagoya protocol's impact on the work of the Network and sharing of FMDV viruses.
- A resolution at the WOAH General Session in May 2025 recommended that WOAH works with Members to identify approaches that could minimise impact on surveillance and control of transboundary diseases (see item 5 of resolution 29: https://www.woah.org/app/uploads/2025/06/2025-92gs-resolutions-final-en.pdf)
- In 2026, it is proposed that an ad-hoc group of WOAH will be established to address this issue (chaired by Don King)
- In adherence to the Nagoya Protocol, The Pirbright Institute will now assess all virus requests for 'utilisation' under Nagoya definitions and only share material where there is appropriate PIC/MAT approvals from the source country. A document defining these new processes will be posted on the WRLFMD website.

10. Review of WOAH/FAO Reference Centre Networks Meeting (Labib Bakkali Kassimi)

- Dr Labib Bakkali Kassimi presented the outcomes from a meeting held at WOAH HQ in May 2025 to discuss common issues within the reference centre networks, focusing on experience sharing, collaboration, and recommendations to strengthen diagnostic and surveillance capacities for transboundary animal diseases. A report from this meeting can be found on the WOAH website : https://www.woah.org/en/strengthening-collaboration-across-our-reference-centre-network/
- Key Points:

- The is often a regional imbalance in these networks; there should be more focus on the gap in the geographic distribution of reference laboratories, especially in Africa, by strengthening representation and diagnostic capacity.
- The was interest in the meeting to adopt platforms similar OpenFMD to share genomic and other data from the networks.

11. Development of New FMD Vaccines (Dr Haixue Zheng)

- This presentation covered work at LVRI to develop next-generation FMD vaccines which aim to provide higher efficacy and broader protection:
- Key points from the talk:
  - Discovery of key molecular mechanisms in host adaptation and immune evasion.
  - LVRI have developed a system to engineer seed strains using a single-plasmid rescue system.
  - High-potency vaccines (≥9 PD_{50}) now in use nationally; maintaining six-year freedom from serotype A and Asia 1 outbreaks.
  - Development of VLP and DIVA-compatible diagnostic kits underway.
- Future goal: apply China's combined vaccination–surveillance model globally.

12. Preparation of draft guidelines to outline the use of pen-side (devolved) tests, lineage specific-PCR for example

- Work in this area is inspired by African Swine Fever Network guidance documents (https://rr-asia.woah.org/en/news/the-oie-asf-reference-laboratory-networks-overview-of-african-swine-fever-diagnostic-tests-for-field-application/).
- Is there a value to supply similar documents for FMD?
  - Yes, and as a starting point could start with LFDs or lineage specific PCR
- Network agrees to do this, but it will be a long process to prepare and a key person to lead this would need to be identified

ACTION 25-12: Dr Vosloo to provide an update from the ASF Network to understand the resources that were need to prepare this document for ASF.

13. Availability of reference reagents for FMD diagnostics

- Current FMD reference sera and antigens largely unchanged for many years.
- The Network plans to publish a more comprehensive list of available sera (WRLFMD, ANSES, SENASA, etc.) on the WOAH–FAO Network website.
- New guidance expected on defining and validating molecular reference standards.
- Dr Aldo Dekker provided document of the standardisation of sera in the past: Mackay, D., Davidson, F., Rendle, T. (1996). FAO Phase XIV - Standardisation of the FMD antibody detection ELISA. European commission for the control of FMD, session of the research group of the standing technical committee. EUFMD. Kibbutz Ma'ala Hachmisha, Israel.

ACTION 25-13: Dr Anna Ludi to put sera on a dedicated page of the Network website as stepping stone to establish a repository of reference sera that are available to other laboratories

ACTION 25-14: Nomenclature group (led by Dr Antonello Di Nardo) to be re-energized by having a follow up meeting. Originally set-up to standardise names but how this is implemented needs to be discussed.