



Government of Nepal
Ministry of Agriculture and Livestock Development
Department of Livestock Services
Foot and Mouth Diseases & TADs Investigation Laboratory
Chapali, Budhanilakantha, Kathmandu Nepal

ANNUAL PROGRESS REPORT

FY 2080/81



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FOREWORD

It is with great appreciation and pleasure that I present the Annual Progress Report of the Foot and Mouth Disease (FMD) & Transboundary Animal Diseases (TADs) Investigation Laboratory, Budhanilkantha, Kathmandu for the Fiscal Year 2080/81. This report reflects the continued commitment, hard work, and technical excellence demonstrated by the entire laboratory team in pursuit of the goals set for the fiscal year.

As the National Reference Laboratory for Foot and Mouth Disease (FMD), Classical Swine Fever (CSF), and Blue Tongue (BT) Disease in Nepal, the FMD & TADs Investigation Laboratory plays a pivotal role in the country's animal health system. The laboratory performs vital diagnostic and surveillance functions, including ELISA-based serotyping of FMD virus, Serosurveillance of FMD, CSF, and BT, as well as Seromonitoring of vaccinated animals for FMD and CSF. Our molecular diagnostic capabilities include both Conventional Multiplex RT-PCR and Real-Time Multiplex RT-PCR, ensuring accurate and timely detection of FMD.

I would like to extend my sincere thanks to all the dedicated staff members whose contributions have made this year's progress possible. Your commitment to excellence, even in the face of challenges, has been instrumental in achieving our objectives.

A special note of gratitude goes to Dr. Chiran Krishna Tiwari, Veterinary Officer, for his hard work and dedication in preparing this comprehensive annual report.

We welcome constructive feedback and suggestions from our readers and stakeholders. Such input is invaluable and will be thoughtfully considered to improve the quality and content of our future reports.

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1. INTRODUCTION

The laboratory, initially named the Foot and Mouth Disease (FMD) Control Laboratory, was established in 2040 B.S. Its name was later changed in 2061/62 B.S. to the National Foot and Mouth Disease and Transboundary Animal Diseases Laboratory (NFMD & TADs Lab). Since 2075/76 B.S., it has been operating under the name Foot and Mouth Diseases & Transboundary Animal Diseases Investigation Laboratory.

This lab has been serving as a National Reference Laboratory for the diagnosis of Foot and Mouth Disease, Classical Swine Fever and Blue Tongue in the country. The diagnosis of FMDV is conducted by serotyping of the tissue samples by Antigen ELISA, Conventional Multiplex RT-PCR and Real Time Multiplex RT-PCR. Likewise, FMD antibody ELISA test for FMD vaccine Seromonitoring and FMD NSP ELISA test for FMD Sero-Surveillance are carried out in the lab. Similarly, the lab has also carried out the antigen ELISA test for Classical Swine Fever diagnosis and antibody ELISA for Classical Swine Fever vaccine Seromonitoring and also Sero-surveillance of Blue Tongue disease by antibody ELISA Test.

Since 2012 AD, Nepal has been actively involved in the OIE/WOAH and SAARC Progressive Control Pathway for the control of FMD at the regional level. As part of this initiative, the laboratory has begun carrier status surveillance in non-vaccinated animals from non-outbreak areas.

During the fiscal year 2080/81, serotype O was identified as the predominant strain of FMDV, with 100% prevalence across twenty-five districts. Among 194 samples tested for FMD diagnosis, no other serotypes were detected.

The laboratory has also been participating in the Proficiency Testing program organized by the World Reference Laboratory for Foot and Mouth Disease (WRLFMD), Pirbright, UK.

2. OBJECTIVES

Following are the major objectives of FMD & TADs Investigation Laboratory.

- 1) Act as a National Reference Laboratory for FMD, Classical Swine Fever, Blue Tongue and other TADs.
- 2) Provide technical support to Department of Livestock Services to develop policies, strategies and program for the control of FMD and TADs and eventual eradication of FMD and TADs.
- 3) Acquire, adopt, upgrade and establish different laboratory diagnostic methods for FMD, CSF & Blue Tongue
- 4) Conduct laboratory diagnosis of FMD virus, CSF & Blue Tongue in case of outbreak, along with serotyping of the FMD virus.
- 5) Conduct Sero-surveillance of FMD, Blue Tongue & CSF; Seromonitoring of FMD and CSF vaccination.
- 6) Create awareness to the public and farmers about FMD & TADs.

3. ANNUAL PROGRAM AND PROGRESS FY 2080/81

Table 1: Annual Program and Progress of FMD & TADs Investigation Laboratory during FY 2080/81

S.N.	Programs/activities	Expenditure title	Unit	Annual target		Annual progress	
				Quantity	Weightage	Quantity	Weightage
A. Under the Capital Expenditure							
11.3.10.444	Purchase an -80°C Upright Freezer for laboratory	31112	number	1	6.53	1	3.33
11.3.11.1028	Purchase and installation of an Air Sampler Machine	31112	number	1	3.35	1	3.34
11.3.11.752	Purchase and installation of an Air Conditioner (AC) for the laboratory.	31112	number	2	0.84	2	0.79
11.3.11.808	Purchase and install a PCR Hood.	31122	number	1	2.34	1	2.34
11.3.11.809	Purchase and installation of computers and printers for Conventional PCR Machines and ELISA Readers in the laboratory.	31122	number	3	1.21	3	1.20
11.3.11.810	Purchase of Multichannel Pipettes (2 units) and Single Channel Pipettes (4 units)	31122	number	6	1.34	6	1.34
11.3.11.812	Purchase and installation of a BOD Incubator for the laboratory	31122	number	1	2.01	1	1.99
11.1.3.532	Upgrade and installation of laboratory furniture in the PCR and ELISA testing rooms	31161	time	1	3.01	1	2.94
Total of capital expenditure				16	20.63	16	17.28
B. Under the Current expenditure							
1.1.1.4	Gazetted Class II	21111	person	1	2.94	1	2.93
1.1.1.5	Gazetted Class III	21111	person	3	7.37	3	6.34
1.1.1.6	Non-Gazetted I Class (Technical)	21111	person	2	4.41	2	4.21
1.1.1.25	Light Vehicle Driver level 5	21111	person	1	2.27	1	2.27
1.1.1.93	Non-Gazetted II Class (Technical)	21111	person	1	2.19	1	2.18
1.1.1.102	Non-Gazetted I Class (Account)	21111	person	1	2.17	1	2.16
1.1.1.138	Non-Gazetted II Class (Admin)	21111	person	1	2.09	1	1.83
1.3.1.1	Dress allowance for Civil servants	21121	person	10	0.33	10	0.33
1.2.2.2	Inflation allowance	21132	person	10	0.8	10	0.80
1.2.8.16	Infant care allowance	21139	person	2	0.03	0	0.00
1.2.10.4	Sitting allowance (meeting/ inventory auction meeting allowance)	21139	number	4	0.16	1	0.15
1.6.2.2	Contribution-based Pension fund	21212	month	3	0.28	3	0.21
1.6.4.1	Employee Contribution-based Insurance fund	21213	person	10	0.32	10	0.14
2.1.1.1	Water Tax	22111	number	4	0.1	4	0.05
2.1.2.1	Electricity Bill	22111	number	1	2.71	4	2.71

S.N.	Programs/activities	Expenditure title	Unit	Annual target		Annual progress	
				Quantity	Weightage	Quantity	Weightage
2.1.3.1	Drinking water (Jar)	22111	jar	1000	0.16	1000	0.16
2.1.3.2	Tanker water	22111	number	12	0.1	10	0.07
2.1.6.11	Communication bill (Telephone/e-mail/internet/postal/courier)	22112	month	2	0.16	3	0.15
2.1.6.43	Telephone bill	22112	number	2	0.1	4	0.09
2.1.7.2	Website update	22112	number	1	0.16	1	0.16
2.2.2.11	Petrol for Motorcycle	22212	liter	576	0.36	576	0.24
2.2.2.33	Mobil, Gear Oil, Brake Oil, etc., for Vehicles and Motorcycles	22212	liter	60	0.19	55	0.10
2.2.2.72	Filling of Gas Cylinders for Office Use	22212	number	12	0.07	10	0.06
2.2.2.239	Diesel for Animal Disease Surveillance and Investigation (Office Fuel)	22212	liter	780	0.46	630	0.29
2.2.2.240	Diesel for Sample Collection from FMD infected animals	22212	liter	600	0.35	420	0.26
2.2.2.315	Fuel for Officials and Office Purpose	22212	liter	480	0.28	480	0.21
2.2.2.316	Fuel for four-wheelers to carry out sample collection for Seromonitoring of FMD and CSF vaccinated animals	22212	liter	540	0.32	500	0.31
2.2.2.323	Fuel for monitoring and evaluation of FMD and TADs animal diseases and related programs at provincial and local levels	22212	liter	480	0.28	420	0.20
2.2.2.352	Diesel for sample collection from CSF infected animals	22212	liter	300	0.18	250	0.15
2.2.2.354	Diesel for Blue Tongue Disease Surveillance and Sample Collection in Sheep, Goats, Cattle, and Buffaloes	22212	liter	300	0.18	285	0.11
2.3.1.5	Repair of Two-Wheeled Vehicles	22213	number	7	0.42	10	0.41
2.3.1.11	Repair of Four-Wheeled Vehicles	22213	number	1	1.21	6	1.21
2.9.2.8	Vehicle Insurance and Renewal	22214	number	10	0.4	12	0.36
2.3.2.98	Repair of Computers, Laptops, Fax, Photocopiers, Printers, and Telephones	22221	number	12	0.2	12	0.20
2.3.2.199	Repair and Maintenance of Laboratory Equipment ; Autoclave, Biosafety Cabinet, Analyzers (maintenance and operating expenses of machinery and tools)	22221	number	3	0.23	4	0.23
2.3.2.280	Replacement of HEPA Filters and Other Repairs for Biosafety	22221	number	1	0.45	1	0.45

S.N.	Programs/activities	Expenditure title	Unit	Annual target		Annual progress	
				Quantity	Weightage	Quantity	Weightage
	Cabinets as suggested by Calibration certificate						
2.3.8.32	Electrical Wiring and Repair in Office Buildings	22231	number	1	1.67	1	1.44
2.3.9.305	Maintenance and painting of Office building, premises and residential buildings	22231	number	1	2.01	1	1.81
2.3.9.351	Management of Biosecurity Fences and Gates for Laboratory Buildings	22231	number	1	1.67	1	1.62
2.4.1.4	Office stationery, toners and other office supplies	22311	number	4	0.47	4	0.46
2.4.1.110	Office Miscellaneous Expenses	22311	number	4	0.6	4	0.60
2.9.5.47	Feed for laboratory animals	22312	number	1	0.33	1	0.29
2.2.3.110	Fuel for Machinery Tools, generators, grass cutters for office purposes (except vehicles)	22314	liter	400	0.24	340	0.24
2.4.12.152	Printing of Informational Materials (Flex, Brochures, Pamphlets) for Disease Investigation and Sample Collection regarding FMD and TADs	22315	number	1	0.6	1	0.58
2.4.13.7	Purchase of Newspapers and Books	22315	number	4	0.1	3	0.04
2.4.13.35	Publication of Annual report	22315	number	1	0.13	1	0.13
2.4.14.3	Information publication expenses	22315	number	4	0.6	4	0.53
2.5.2.484	Calibration of laboratory equipment	22411	number	1	1.67	1	1.66
2.5.3.106	Contract for security guard service	22411	number	2	2.01	2	1.65
2.5.3.555	Operation, Maintenance, and Repair of Laboratory Equipment (Service Contract)	22411	number	1	0.27	1	0.16
2.5.7.5	Dress Allowance for Contract Employees	22413	number	2	0.07	2	0.07
2.5.7.20	Garden Maintenance Contract	22413	person	1	0.2	1	0.20
2.5.7.91	Office helper staff Contract	22413	person	2	2.09	2	1.99
2.5.7.222	Festival Allowance for Contract Employees (individual contract)	22413	number	2	0.17	2	0.17
2.5.8.9	Maintenance and Management of Internet and Electrical Equipment (Computers, Fax, Photocopiers, Printers)	22413	number	1	0.14	1	0.14
2.5.8.126	Cleaning Service Contract	22413	person	1	0.2	1	0.20
2.6.2.2	Employee Driving Training	22511	number	4	0.4	4	0.40

S.N.	Programs/activities	Expenditure title	Unit	Annual target		Annual progress	
				Quantity	Weightage	Quantity	Weightage
2.6.4.1074	Interaction Programs for Disease Investigation and Control of FMD and other TADs at Provincial and Local Levels	22512	number	4	0.8	4	0.80
2.6.4.1073	Three-Day Training for Field Technicians on Quality Sample Collection, Preservation, Coding, and Dispatch	22512	number	2	0.94	2	0.94
2.7.7.309	Testing of Foot and Mouth Disease (FMD) by FMD NSP ELISA Method	22522	number	2000	0.29	2201	0.29
2.7.18.1489	Preparation and Distribution of Sample Collection Media Kit for FMD disease	22522	number	600	0.43	625	0.42
2.7.18.1671	Purchase of Reagent Kits for Differential Diagnosis of Swine Fever using PCR Method	22522	number	1	0.57	1	0.56
2.7.18.1670	Testing of FMD using Real-Time PCR Method	22522	number	150	0.57	184	0.57
2.7.21.6	Garden Management	22522	number	4	0.17	4	0.17
2.7.22.78	Health Checkup for Office staff	22522	person	12	0.17	8	0.12
2.7.25.1088	Purchase of Viral RNA Extraction and Purification Mini Kits (250 Tests)	22522	number	2	1.25	2	1.25
2.7.25.1095	Serosurveillance for carrier status under the National Foot and Mouth Disease Control Program	22522	number	800	0.57	881	0.57
2.7.25.1093	Testing of Samples Collected from Vaccinated Animals (Seromonitoring) under the National Foot and Mouth Disease Control Program	22522	number	600	0.43	1403	0.43
2.7.25.1107	Purchase of ELISA Kits for CSF Diagnosis (Antigen)	22522	number	1	0.57	1	0.56
2.7.25.1119	Sample Preservation and Dispatch to OIE Reference Lab	22522	number	1	1	1	0.93
2.7.25.1116	Purchase of ELISA Kits for Blue Tongue Disease Diagnosis in Sheep and Goats	22522	number	3	1.54	3	1.53
2.7.25.1255	Purchase of FMD NSP ELISA Kits and Reagents for Foot and Mouth Disease Carrier Status serosurveillance	22522	number	4	2.28	4	2.28
2.7.25.1252	Purchase of FMD Serotyping Kits and Reagents	22522	number	3	1.54	4	1.53
2.7.25.1260	Management and ELISA Kits for testing samples Collected from	22522	number	3	2.14	3	2.14

S.N.	Programs/activities	Expenditure title	Unit	Annual target		Annual progress	
				Quantity	Weightage	Quantity	Weightage
	Vaccinated Animals under the National Foot and Mouth Disease Control Program						
2.7.25.1429	Purchase of Probe Master Mix Reagents for Conventional RT-PCR	22522	number	2	0.85	2	0.85
2.7.25.1428	Purchase of Primer Probe Master Mix Reagent Kits for Real-Time RT-PCR Testing of Foot and Mouth Disease	22522	number	2	1.14	2	1.14
2.7.25.1426	Investigation and Sample Collection from Foot and Mouth Disease Outbreaks in Cattle and Buffaloes	22522	number	200	0.14	264	0.14
2.7.25.1425	FMD Surveillance and Sample Collection from Domestic Animals in National Park Buffer Zones area	22522	number	300	0.21	317	0.21
2.7.25.1423	Risk-Based Surveillance and Sample Collection for Foot and Mouth Disease	22522	number	300	0.21	298	0.21
2.7.25.1439	Logistic Support for Laboratory Staff (Soap, Surf, Gloves, Masks, Aprons, Sanitizers, Torches, etc.)	22522	number	2	0.34	2	0.34
2.7.25.1435	Surveillance and Sample Collection for Blue Tongue Disease in Sheep, Goats, Cattle, and Buffaloes	22522	number	600	0.34	639	0.34
2.7.25.1434	Purchase of Antibody ELISA Kits and Reagents for CSF Diagnosis	22522	number	1	0.49	1	0.49
2.7.25.1432	Surveillance, Investigation, Sample Collection, and Laboratory Testing for CSF in Pigs	22522	number	150	0.09	169	0.08
2.7.25.1431	Testing of Samples Collected from Vaccinated Animals under the National Foot and Mouth Disease Control Program from other federal, provincial & local offices	22522	number	900	0.13	1486	0.13
2.7.25.1430	Purchase of Reagent Kits for Differential Diagnosis of Foot and Mouth Disease	22522	number	1	0.71	1	0.71
2.7.25.1433	Sample Collection from Vaccinated Animals (Seromonitoring) under the	22522	number	150	0.09	166	0.09

S.N.	Programs/activities	Expenditure title	Unit	Annual target		Annual progress	
				Quantity	Weightage	Quantity	Weightage
	National Classical Swine Fever Control Program						
2.7.25.1442	FMD carrier status Sero surveillance, sample collection & laboratory testing from live animal markets, quarantine checkpoints, and festival target haat bazars	22522	number	300	0.21	306	0.21
2.7.25.1609	Testing of Foot & Mouth Disease using Conventional PCR Method	22522	number	200	0.57	272	0.57
2.8.1.579	Monitoring and Evaluation of TADs in Veterinary disease investigation laboratories (Internal visit)	22611	number	3	0.3	6	0.13
2.8.1.580	Monitoring and Evaluation of Foot and Mouth Disease and Classical Swine Fever Programs at Provincial and Local Levels (Internal visit)	22611	number	3	0.3	3	0.25
2.8.1.774	Visit to provide expert services related to animal disease investigation and control at provincial and local levels	22611	number	2	0.2	6	0.20
2.8.1.836	Inter-Laboratory Study Visits and Observation	22611	number	1	0.2	1	0.20
2.8.2.2	Various Administrative Visits	22612	number	3	0.2	2	0.14
2.8.2.47	Daily Allowance for field technician	22612	number	4	0.2	12	0.20
2.8.2.295	FMD carrier status serosurveillance on main market and quarantine check post (Internal visit)	22612	number	2	0.23	2	0.23
2.8.2.394	Visit expense for FMD sample collection media kits preparation and distribution to other federal offices, provincial and local levels	22612	number	4	0.4	8	0.33
2.8.2.396	Travel Expenses for FMD carrier status serosurveillance and sample collection from Cattle, Buffaloes, Sheep, and Goats	22612	number	4	0.47	4	0.35
2.8.2.397	Travel Expenses for Risk-based FMD serosurveillance and sample collection	22612	number	2	0.23	2	0.23
2.8.2.398	Travel Expenses for Surveillance and Sample Collection from Domestic Animals in National Park Buffer Zones Areas	22612	number	2	0.23	2	0.22

S.N.	Programs/activities	Expenditure title	Unit	Annual target		Annual progress	
				Quantity	Weightage	Quantity	Weightage
2.8.2.399	Travel Expenses for Investigation and Sample Collection during Foot and Mouth Disease Outbreaks in Cattle and Buffaloes	22612	number	6	0.7	6	0.52
2.8.2.401	Travel Expenses for Sample Collection from Vaccinated Animals (Seromonitoring) under the National Foot and Mouth Disease Control Program	22612	number	4	0.47	4	0.41
2.8.2.402	Travel Expenses for Classical Swine Fever Surveillance, Investigation, and Sample Collection in Pigs	22612	number	4	0.54	4	0.54
2.8.2.403	Travel Expenses for Sample Collection from Vaccinated Animals (Seromonitoring) under the National Classical Swine Fever Control Program	22612	number	3	0.4	3	0.36
2.8.2.404	Travel Expenses for Blue Tongue Disease Surveillance and Sample Collection in Sheep, Goats, Cattle, and Buffaloes	22612	number	4	0.47	4	0.46
2.9.6.1	Daily Tea Expenses in the Office	22711	number	12	0.4	12	0.40
2.9.6.5	Other Miscellaneous Expenses	22711	month	12	0.08	12	0.08
2.9.6.7	Tea Expenses for Regular Staff Meetings	22711	month	12	0.1	12	0.10
2.9.8.7	Hospitality, Welcome, and Farewell Programs cost	22711	number	4	0.08	4	0.08
7.2.9.40	Purchase of Medicines for Distribution to Farmers during Disease Surveillance and Sample Collection	27213	number	2	0.57	2	0.56
7.2.9.41	Purchase of Medicines for Distribution to Farmers during Seromonitoring under National Disease Control Programs	27213	number	2	0.57	2	0.57
8.1.6.21	Hiring Vehicles for disease investigation, control, and management of disease outbreaks	28143	number	6	1.13	6	1.07
Under the current expenditure				13071	79.32	14494	74.37
Under the capital and current expenditure				13087	99.95	14510	91.65

Total Financial progress: 91.6 %

Total weightage progress: 91.7 %

4. MAJOR ACTIVITIES OF THE LABORATORY DURING FY 2080/81

4.1 FMD Sample collection and Virus typing

In total, 194 suspected samples from affected animals were received from FMD outbreak & non outbreak areas across different districts. Out of 77 district, 25 districts with suspected FMD cases were laboratory confirmed as FMD positive while 3 districts (Doti, Kailali and Dhanusha) having clinical cases of FMD were not confirmed by laboratory test. Out of 194 samples, 117 samples were positive for FMD virus serotype O and none of the samples were positive for other serotypes. Most of the received samples in the present fiscal year were qualitatively better in compare to previous years. The training programs and interaction with field level technical manpower as an integrative extension program of lab might have contributed for acquiring quality sample from field. However, the best samples for laboratory diagnosis of FMD like vesicular fluid, epithelium from the tissue, tongue, gums and dental pads and tissues from the inter-digital space at the early stage of infection within 4 days of onset of clinical signs are still lacking in some cases. Therefore, field veterinarians and technicians are required to know what and how the sample are collected and keep attention for the quality aspects of the samples in order to get better laboratory results.

Table 2: Month wise Serotyping of FMD Virus by ELISA and RT-PCR method FY 2080/81 (Surveillance and Outbreak)

Trimester	Month	No. of tested samples	FMDV Serotypes				FMD positive districts
			O	A	Asia-1	NVD	
1	Shrawan	1	-	-	-	1	-
	Bhadra	0	-	-	-	-	-
	Ashoj	78	2	-	-	76	Chitwan
2	Kartik	25	19	-	-	6	Bhaktapur, Kaski, Kathmandu, Kavrepalanchowk, Lalitpur, Makwanpur, Nawalparasi W, Jhapa
	Mangsir	26	22	-	-	4	Bajhang, Chitwan, Gorkha, Kathmandu
	Poush	33	23	-	-	10	Chitwan, Kathmandu, Morang, Nawalpur E, Tanahun
3	Magh	61	23	-	-	38	Chitwan, Lalitpur, Lamjung, Tanahun
	Falgun	11	9	-	-	2	Dhading, Dolakha, Gulmi, Kapilbastu, Kathmandu, Kavrepalanchowk, Okhaldhunga, Ramechhap
	Chaitra	7	6	-	-	1	Dhading, Kavrepalanchowk
4	Baishakh	9	4	-	-	5	Dolakha, Dhading
	Jestha	11	4	-	-	7	Khotang, Morang, Sunsari, Udaypur
	Ashad	183	5	-	-	178	Sindhuli, Tanahun
Total		445	117	-	-	328	25/77

Table 3: District wise serotyping of FMD virus by Ag ELISA and RT-PCR method FY 2080/81 (Outbreak)

SN	District	No. of tested sample	FMDV Serotype			
			O	A	Asia-1	NVD
1	Bajhang	4	2	-	-	2
2	Bhaktapur	4	2	-	-	2
3	Chitwan	20	16	-	-	4
4	Dhading	14	10	-	-	4
5	Dhanusha	1	-	-	-	1
6	Dolakha	6	3	-	-	3
7	Gorkha	5	4	-	-	1
8	Gulmi	2	2	-	-	-
9	Jhapa	5	5	-	-	-
10	Kailali	9	-	-	-	9
11	Kapilbastu	10	2	-	-	8
12	Kaski	7	6	-	-	1
13	Kathmandu	22	15	-	-	7
14	Kavrepalanchowk	24	7	-	-	17
15	Khotang	3	3	-	-	-
16	Lalitpur	5	5	-	-	-
17	Lamjung	1	1	-	-	-
18	Makwanpur	4	1	-	-	3
19	Morang	8	6	-	-	2
20	Nawalparasi W	4	2	-	-	2
21	Nawalpur E	4	2	-	-	2
22	Okhaldhunga	5	4	-	-	1
23	Ramechhap	12	5	-	-	7
24	Sindhuli	3	3	-	-	-
25	Sunsari	1	1	-	-	-
26	Tanahun	8	7	-	-	1
27	Udaypur	3	3	-	-	-
Total		194	117	-	-	77

Table 4: Province wise distribution of FMD outbreak FY 2080/81

SN	Province	Lab confirmed FMD +ve districts	FMD Clinical Cases only	FMD outbreak districts
1	Koshi	Jhapa (5), Khotang (3), Morang (6), Okhaldhunga (4), Sunsari (1), Udaypur (3)	-	6/14
2	Madhesh	-	Dhanusha	1/8
3	Bagmati	Chitwan (16), Bhaktapur (2), Dhading (10), Dolakha (3), Makwanpur (1), Kathmandu (15), Kavrepalanchowk (7), Lalitpur (5), Ramechhap (5), Sindhuli (3)	-	10/13
4	Gandaki	Gorkha (4), Kaski (6), Lamjung (1), Nawalpur E (2), Tanahun (7)	-	5/11
5	Lumbini	Gulmi (2), Kapilbastu (2), Nawalparasi W (2)	-	3/12
6	Karnali	-	-	0/10
7	Sudurpaschim	Bajhang (2)	Kailali, Doti	3/9
Total		25 Districts	3	28/77

Figure 1: Province wise FMD Outbreak Pattern FY 2080/81 (Lab confirmed)

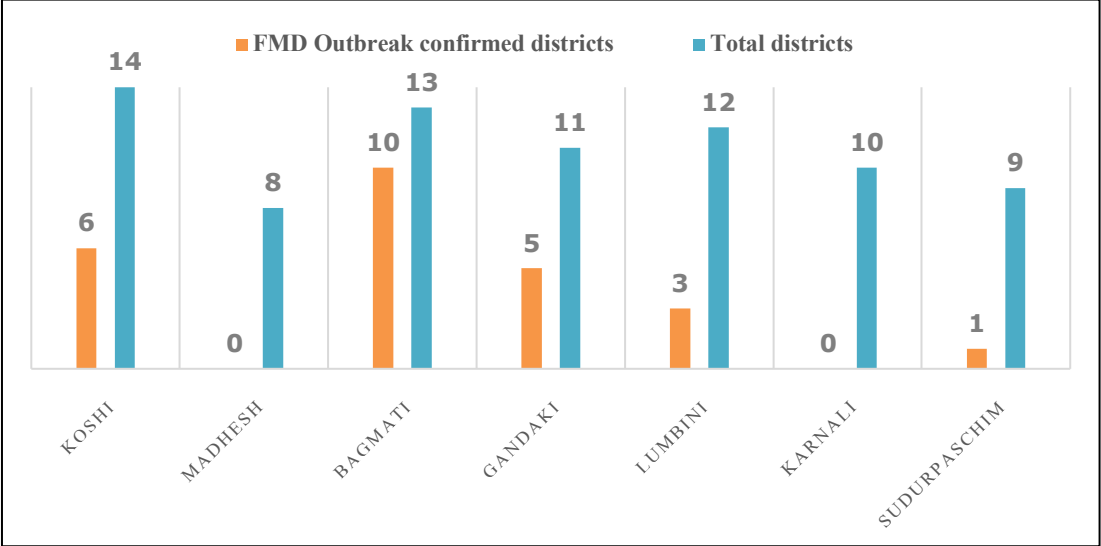
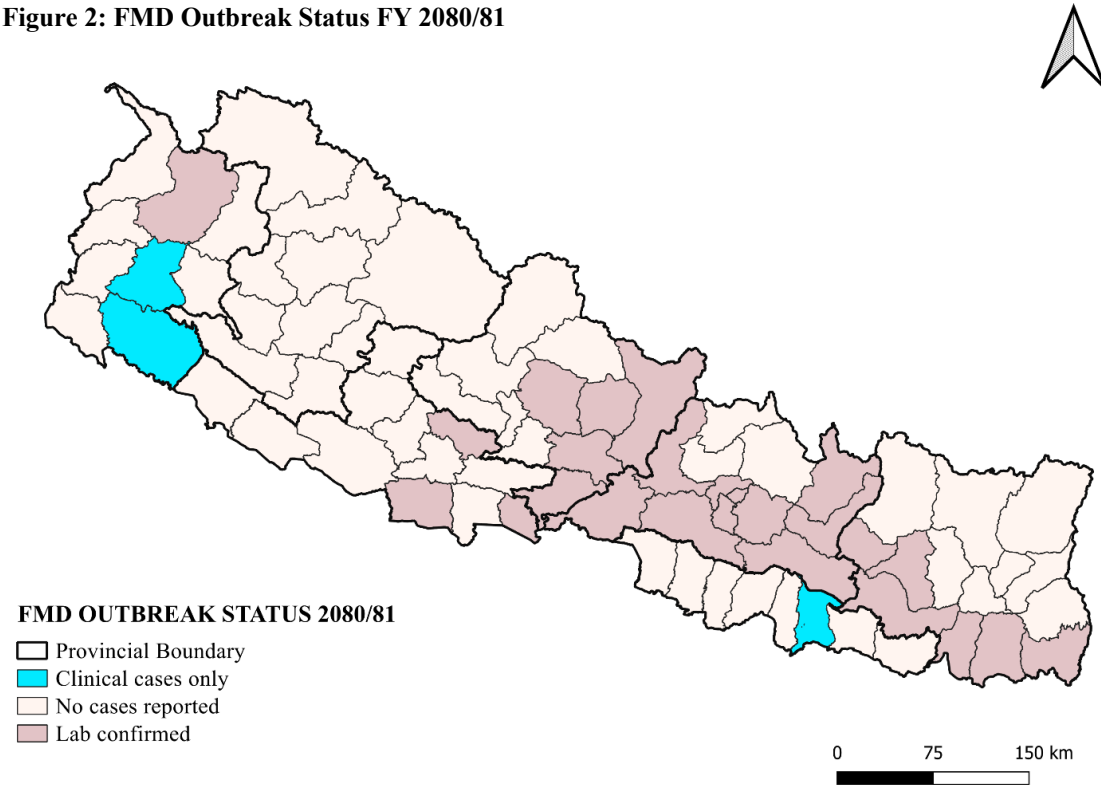


Figure 2: FMD Outbreak Status FY 2080/81



4.2 FMD carrier status Serosurveillance

A total no of 2201 serum samples from different districts were either collected by our lab staffs or received from other offices; Veterinary Laboratories, Quarantine offices, Veterinary Hospital & Livestock Service Expert Centre of provinces and Livestock service unit from various local levels. Those samples were tested by FMD NSP antibody ELISA test to study the carrier status of FMD in the animals. Out of 2201 serum samples, 247 samples (11.2%) were positive and 1954 samples (88.8%) were negative.

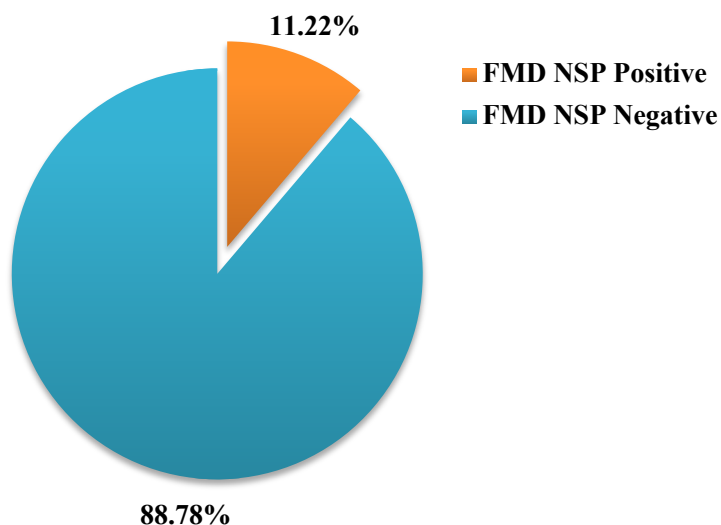
Table 5: District wise result of FMD NSP Antibody ELISA test for FY 2080/81

SN	District	No.of tested samples	Positive	Negative	Positive%
1	Bara	153	29	124	19.0
2	Bhaktapur	67	1	66	1.5
3	Chitwan	194	38	156	19.6
4	Dhading	31	1	30	3.2
5	Kaski	162	3	159	1.9
6	Kathmandu	191	19	172	9.9
7	Kavrepalanchowk	36	4	32	11.1
8	Lalitpur	213	20	193	9.4
9	Makwanpur	155	49	106	31.6
10	Manang	171	1	170	0.6
11	Nawalpur (East)	184	42	142	22.8
12	Rasuwa	162	0	162	0.0
13	Rupandehi	78	23	55	29.5
14	Siraha	114	4	110	3.5
15	Surkhet	140	6	134	4.3
16	Taplejung	150	7	143	4.7
Total		2201	247	1954	11.2

Table 6: Species wise result of FMD NSP Antibody ELISA test for FY 2080/81

SN	Species	Total sample	Positive	Negative	Pos%
1	Goat	1794	201	1593	11.20
2	Sheep	207	7	200	3.38
3	Cattle	178	35	143	19.66
4	Buffalo	22	4	18	18.18
Total		2201	247	1954	11.22

Figure 3: FMD NSP Serosurveillance ELISA Result FY 2080/81



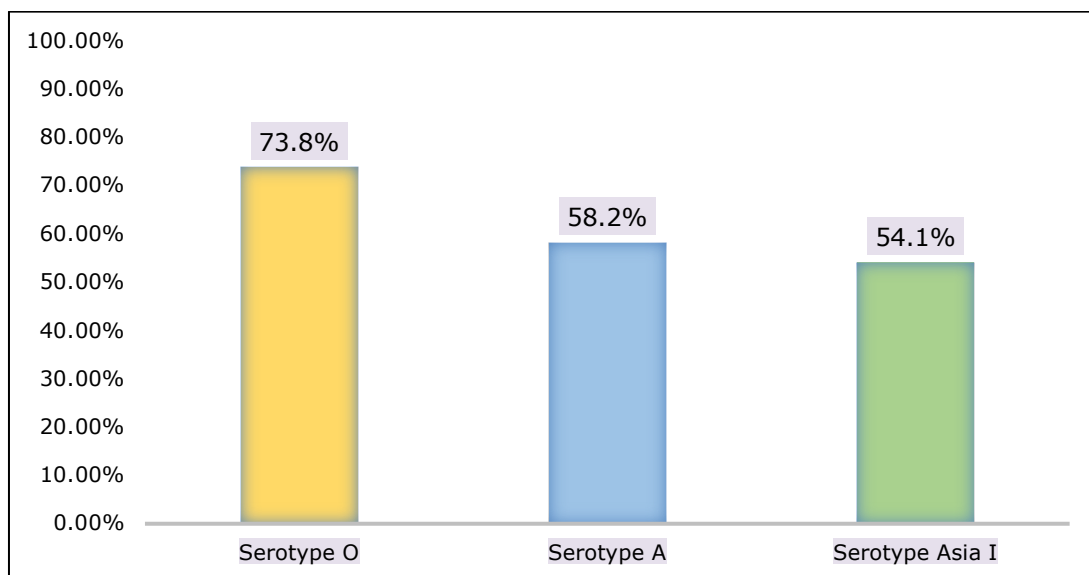
4.3 FMD Vaccine Seromonitoring

A total no of 2889 serum samples was received from 28 districts and tested by FMD Antibody ELISA test. All samples were tested for FMD type O antibody and 2132 (73.8%) out of total samples were found positive. Only 428 serum samples were tested for type A and 270 samples were tested for type Asia 1 antibody. Out of which 249 (58.18%) samples were found positive for antibody type A and 146(54.07%) samples were found positive for antibody Type Asia 1.

Table 7: FMD Vaccine Seromonitoring status FY 2080/81

S.N.	Province	District	Total Sample	Serotype O			Serotype A			Serotype Asia-1		
				Positive	Negative	Positive %	Positive	Negative	Positive %	Positive	Negative	Positive %
1	KOSHI	Dhankuta	81	56	25	69.1	-	-	-	-	-	-
2		Ilam	100	72	28	72	-	-	-	-	-	-
3		Jhapa	61	46	15	75.4	-	-	-	-	-	-
4		Morang	102	82	20	80.4	-	-	-	-	-	-
5		Sunsari	194	115	79	59.3	-	-	-	-	-	-
6		Udaypur	80	59	21	73.8	-	-	-	-	-	-
7	MADHESH	Bara	86	62	24	72.1	-	-	-	-	-	-
8		Mahottari	86	23	63	26.7	-	-	-	-	-	-
9		Parsa	104	63	41	60.6	-	-	-	-	-	-
10		Rautahat	92	52	40	56.5	-	-	-	-	-	-
11		Saptari	81	57	24	70.4	-	-	-	-	-	-
12		Sarlahi	81	61	20	75.3	-	-	-	-	-	-
13	BAGMATI	Siraha	81	54	27	66.7	-	-	-	-	-	-
14		Bhaktapur	103	90	13	87.4	20	2	90.9	19	3	86.4
15		Chitwan	177	152	25	85.9	43	23	65.2	19	7	73.1
16		Dhading	125	94	31	75.2	4	22	15.4	1	25	3.8
17		Dolakha	114	70	44	61.4	6	12	33.3	5	13	27.8
18		Kathmandu	176	168	8	95.5	23	29	44.2	4	8	33.3
19		Kavre	159	101	58	63.5	33	43	43.4	13	14	48.1
20		Lalitpur	23	12	11	52.2	0	5	0	0	5	0
21		Makwanpur	158	143	15	90.5	39	11	78	23	5	82.1
22		Ramechhap	123	99	24	80.5	21	9	70	20	6	76.9
23		Sindhuli	86	35	51	40.7	4	14	22.2	3	15	16.7
24	GANDAKI	Lamjung	98	98	0	100	21	0	100	13	5	72.2
25	LUMBINI	Dang	27	18	9	66.7	-	-	-	-	-	-
26		Kapilbastu	20	16	4	80	-	-	-	-	-	-
27		Nawalparashi	161	136	25	84.5	26	1	96.3	21	6	77.8
28		Rupandehi	110	98	12	89.1	9	8	52.9	5	12	29.4
Total sample			2889	2889			428			270		
Average result				2132	757	73.8	249	179	58.2	146	124	54.1

Figure 4 Seroconversion of FMD vaccine FY 2080/81 (Positive % in O, A & Asia-1 antibody)



4.4 Classical Swine Fever (CSF) Laboratory Diagnosis

Classical Swine Fever (CSF) is a highly contagious and economically significant viral disease of pig caused by classical swine fever virus (CSFV), a member of the genus *Pesti* virus and family *Flaviviridae*. Only one CSFV serotype has been found, but minor antigenic variability has been demonstrated between viral strains.

CSF Antigen ELISA test result

In FY 2080/81 a total number of 3 tissue samples from suspected pigs were received and tested by antigen ELISA method in the lab. All 3 samples were tested negative for CSF antigen.

Table 8: Result of CSFV Antigen ELISA test FY 2080/81

SN	District	Total samples	Positive	Negative	Remarks
1	Kathmandu	3	0	3	ASF+ve
Total		3	0	3	

CSF Serosurveillance test result

A total no. of 169 serum samples was received from unvaccinated pigs of 4 districts and tested by CSF antibody ELISA test. Out of 169 tested samples, only 11 samples (6.5%) were found positive for CSFV antibody.

Table 9: CSF Serosurveillance status FY 2080/81

SN	District	Total samples	Positive	Negative	Positive%
1	Chitwan	45	7	38	15.5
2	Dhading	42	4	38	19
3	Khotang	38	0	38	0
4	Sunsari	44	0	44	0
Total		169	11	158	6.5

CSF Vaccine Seromonitoring test result

A total no. of 170 serum samples was received from 4 districts and tested by CSF antibody ELISA test. Out of 170 serum samples only 93 samples (54.7%) were positive for CSFV antibody

Table 10: CSFV Vaccine Seromonitoring FY 2080/81

SN	District	Total samples	Positive	Negative	Positive%
1	Morang	29	2	27	6.9
2	Nawalpur	50	32	18	64
3	Nuwakot	50	22	28	44
4	Sankhuwasabha	41	37	4	90.24
Total		170	93	77	54.7

4.5 Blue Tongue Serosurveillance

Blue Tongue is an infectious, non-contagious, arthropod (*Culicoides* species) transmitted disease of sheep with possible occurrence in other domestic and wild ruminants. During 2080/81, a total number of 639 serum samples was collected from Cattle, Buffalo, Sheep & Goat from 4 districts. Out of tested samples, 167 (26.1%) were positive and 472 samples were negative.

Table 11: Blue Tongue Serosurveillance status FY 2080/81

SN	District	Total samples	Positive	Negative	Positive%
1	Kaski	150	62	88	41.33
2	Manang	171	49	122	28.65
3	Syangja	158	38	120	24.05
4	Taplejung	160	18	142	11.25
Total		639	167	472	26.1

5 STAFF DETAILS

Table 12: FMD & TADs Investigation Lab Staff details

SN	Name	Post	Class	Post sanctioned	Post Available	Vacant
1	Dr. Krishna Raj Pandey	Senior Veterinary Officer	G. Class II	1	1	0
2	Dr. Nisha Poudel	Veterinary Officer	G. Class III	3	3	0
3	Dr. Chiran Krishna Tiwari	Veterinary Officer	G. Class III			
4	Dr. Durga Dhungana	Veterinary Officer	G. Class III			
5	Mr. Shiba Kumar Karki	Animal Health Technician	Non-G. Class I	2	2	0
6	Mr. Bal Kumar Rai	Animal Health Technician	Non-G. Class I			
7	Mrs. Bhawani Bhandari/ Adhikari	Accountant	Non-G. Class I	1	1	0
8	Mr. Chitra Bahadur Basnet	Assistant Animal Health Technician	Non-G. Class II	1	1	0
9	Mr. Uttam Nath	Kharidar	Non-G. Class II	1	1	0
10	Mr. Shankar Prasad Paudel	Light Driver	Unclassified	1	1	0
11	Mr. Radhika Rai	Office Helper	Unclassified	2	2	0
12	Mrs. Roshan Thapa	Office Helper	Unclassified			
Total				12	12	0

6 LABORATORY ANIMAL MANAGEMENT

FMD Laboratory has an animal house where rabbits are reared especially for usage in diagnostic procedures at diagnostic laboratories and development of vaccines at National Vaccine Production Laboratory.

Table 13: Record of lab animals in FMD & TADs Investigation Lab FY 2080/81

Animal Detail	Distributed in NVPL	Stock in the unit
Rabbit	6	16
Total	6	16

7. OTHER ACTIVITIES OF LAB

FMD Laboratory conducts laboratory extension programs which includes transfer of laboratory technology through interactions about Transboundary animal diseases with stakeholders, field level training about sample collection, preservation, coding and dispatch to the laboratories and also distributes laboratory publication regarding sample collection of various TADs and information on FMD. In addition, for the quality sample collection and dispatch during outbreak of FMD across the country, the lab produces virus transport media-kit for FMD sample collection and distributes to sub national and provincial veterinary laboratories, Veterinary Hospital and Livestock Service Expert Centre (VHLSEC) as well as other veterinary services in local levels.

Table 14: Distribution of FMD virus transport media-kit for FY 2080/81

SN	Office	District (number of media-kit)	No of media kit distributed
1	VLs	Kaski (60), Morang (60), Nawalpur W (40)	160
2	VHLSEC	Kaski (60), Tanahun (30), Syangja (30), Taplejung (20), Panchthar (20), Jhapa (40), Manang (30), Lamjung (30), Rupandehi (20), Gulmi (20), Chitwan (20), Makwanpur (30), Nuwakot (30), Lalitpur (10), Dhading (20), Ramechhap (30)	410
3	Local Level veterinary service	Ramechhap (Manthali municipality, 20), Khotang (Halesi-Tuwachung municipality, 20), Dhading (Thakre rural municipality, 20), Gajuri rural municipality, 15)	75
Total			645

Table 15: FMD & TADs flex distribution status for FY 2080/81

SN	Flex distributed offices	Office	Total no. of flex distributed
1	VHLSEC	Chitwan (24), Dhanusha (30), Gulmi (30), Ilam (20), Jhapa (4), Kapilvastu (4), Kaski (20), Lalitpur (50), Lamjung (4), Manang (12), Morang (4), Nuwakot (40), Panchthar (4), Ramechhap (20), Taplejung (4), Tanahun (30),	300
2	Offices under MoALD	2	6
3	Offices under DLS	12	38
4	Provincial Ministry	Ministry of Industry, Agriculture and Cooperatives- Koshi Province	4
5	DoLFD	Koshi (4), Gandaki (4)	8
6	Livestock Training Centre	Koshi (4), Bagmati (6), Gandaki (4)	14
7	Livestock Services at local level	Mahankal RM (2), Manahari RM (4), Budhanilkantha M (2), Fungling M (2)	10

8	International Organizations	Food and Agriculture Organization -Nepal (2)	2
9	Veterinary Teaching Institutes	Agriculture and Forestry University, Chitwan (4), Nepal Polytechnic Institute, Chitwan (4)	8
10	Nepal Veterinary Council	1	2
11	Animal Health and Livestock Services Professional Council	1	2
Total			394

8. BUDGET SUMMARY

Table 16: Details of Budget Transaction and Expenditure FY 2080/81

Budget Line	Budget heads	Approved budget (NRS in 000)	Expenditure (NRS in 000)
21111	Staff Salary	7002	6550
21121	Dress	100	100
21212	Contribution-based Pension fund	84	63
21139	Guard duty Allowance	58	45
21132	Inflation allowance	240	240
21213	Insurance Fund for staffs	96	43
22111	Water & Electricity Tariff	917	893
22112	Telephone and Communication	126	119
22212	Fuel	793	580
22213	Repair of Vehicle	486	482
22214	Insurance and Renewal	120	109
22221	Machinery Equipment Repair Cost	263	263
22231	Cost of Maintenance of built public assets	1600	1452
22311	Masalanda and Office materials	320	317
22312	Animal feed	100	87
22314	Fuel (Extra Uses)	72	72
22315	Newspaper & Annual Report publication Cost	430	384
22411	Service and Counseling Cost	1180	1036
22413	Contract Service Cost	858	822
22511	Staff Training Cost	120	120
22512	Skill development and Public Awareness Training Cost	520	520
22522	Program cost	5683	5631
22611	Evaluation and monitoring cost	300	232
22612	Travel cost	1360	1194
22711	Miscellaneous cost	198	198
27213	Cost of Veterinary Drugs	340	338
28143	Vehicles Hiring cost	336	318
Total		23702	22208
31122	Machineries and Tools	5260	4281
31161	Structural repair of constructed buildings	900	878
Total amount		6160	5159
Grand total amount		29862	27367

9. MAJOR ACHIEVEMENTS

- 1) Routine Serotyping of FMD virus at the laboratory has helped to know the status of FMD virus serotypes in the country and vaccine to be used. Finally, it helps to control the FMD in time and prevent from the heavy economic loss of farmers.
- 2) Routine Serosurveillance of FMDV to find out the status of FMD in non- outbreaks areas and help to lunch RBSP of FMD PCP Control Pathway.
- 3) Routine Serosurveillance of CSFV to find out the status of CSFV in the porcine population of Nepal.
- 4) Serosurveillance of Blue-Tongue disease in sheep, goat, cattle and buffalo also helps to know the status of disease in Nepal.
- 5) Routine Seromonitoring of vaccinated animals against FMDV and CSFV give the clear picture about the quality of vaccine and effectiveness of vaccination program.
- 6) The laboratory has been doing the molecular diagnosis of FMDV by Conventional Multiplex RT-PCR since 2012 and by Real Time Multiplex RT-PCR by 2022.
- 7) The laboratory has been sending the few FMD outbreak sample annually to WRLFMD, Pirbright, UK for Genotyping & Vaccine Matching Test.
- 8) The Laboratory has been actively participating in the Proficiency Testing (PT) done by WRLFMD, Pirbright, UK. Six virology samples and four serology samples were received and tested in the fiscal year 2080/81 for proficiency testing.
- 9) The laboratory has been doing routine calibration of laboratory equipment in order to maintain measurement accuracy, uniformity, and repeatability, ensuring trustworthy standards and outcomes.
- 10) In this fiscal year 2080/81, a new BSL 2 plus lab has been constructed for FMD & TADs Investigation Laboratory by Nepal Livestock Sector Innovation Project (NLSIP). Now the molecular service by the lab has been shifted to new BSL 2 plus lab.

ABBREVIATIONS

ASF	: African Swine Fever
BTV	: Blue Tongue Virus
BSL	: Biosafety Level
CSFV	: Classical Swine Fever Virus
CVL	: Central Veterinary Laboratory
DLS	: Department of Livestock Service
DoLFD	: Department of Livestock and Fisheries Development
ELISA	: Enzyme Linked Immunosorbent Assay
FAO	: Food and Agriculture Organization
F/Y	: Fiscal Year
FMD	: Foot and Mouth Disease
FMDV	: Foot and Mouth Disease Virus
M	: Municipality
MoALD	: Ministry of Agriculture and Livestock Development
NLSIP	: Nepal Livestock Sector Innovation Project
NSP	: Non-Structural Protein
NVD	: No Virus Detected
OIE	: Office International des Epizooties
PCP	: Progressive Control Pathway
PCR	: Polymerase Chain Reaction
PT	: Proficiency Test
RBSP	: Risk Based Surveillance Plan
RM	: Rural Municipality
RT-PCR	: Reverse Transcription Polymerase Chain Reaction
SAARC	: South Asian Association for Regional Cooperation
TADs	: Transboundary Animal Diseases
UK	: United Kingdom
VHLSEC	: Veterinary Hospital and Livestock Service Expert Centre
VL	: Veterinary Laboratory
WOAH	: World Organization for Animal Health
WRLFMD	: World Reference Laboratory for Foot and Mouth Disease

Some glimpses of FMD Serosurveillance, Seromonitoring and Outbreak Investigation programs



Fig: Festival oriented FMD Carrier status serosurveillance FY 2080/81



Fig: Risk based FMD Surveillance sample collection team at Siraha (Left), Bara (Right)



Fig: FMD Surveillance in National Park Buffer Zone area sample collection team at Parsa (Left), Rasuwa (Right)



Fig: Sample Collection for FMD Sero-surveillance (Parsa, Nawalpur E, Rasuwa)



Fig: Sample Collection for FMD Sero-monitoring (Lalitpur, Rupandehi, Lamjung)



Fig: Collection of tissue sample during FMD Outbreak Investigation (Chitwan, Kavrepalanchowk, Kathmandu)

Some glimpses of Blue Tongue Serosurveillance



Fig: FMD & TADs Lab team for Blue Tongue Serosurveillance at Syangja



Fig: FMD & TADs Lab team for Blue Tongue Serosurveillance at Taplejung



Fig: FMD & TADs Lab team for Blue Tongue Serosurveillance at Manang

Some glimpses of CSF Serosurveillance and Seromonitoring



Fig: Sample collection for CSF Serosurveillance



Sample collection from CSF Seromonitoring

Some glimpses of laboratory tests at FMD & TADs Laboratory

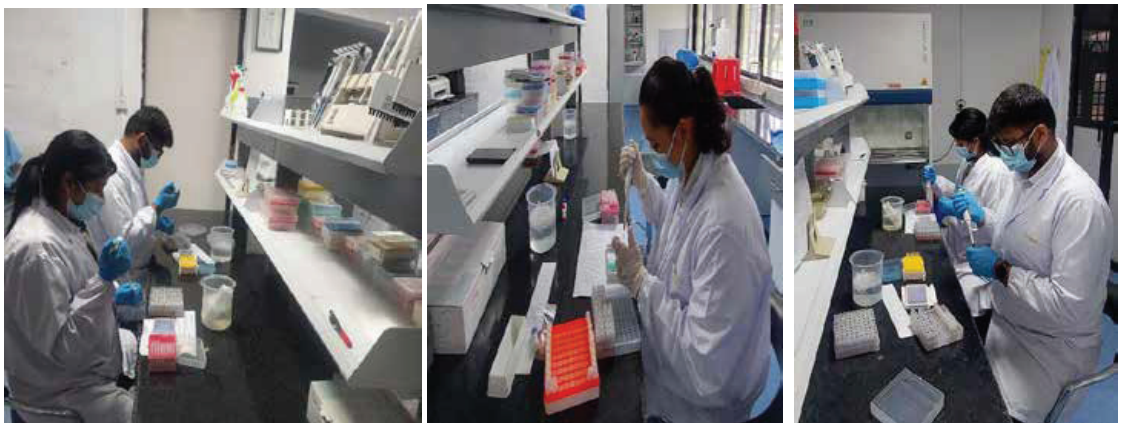


Fig: Laboratory testing at serology lab

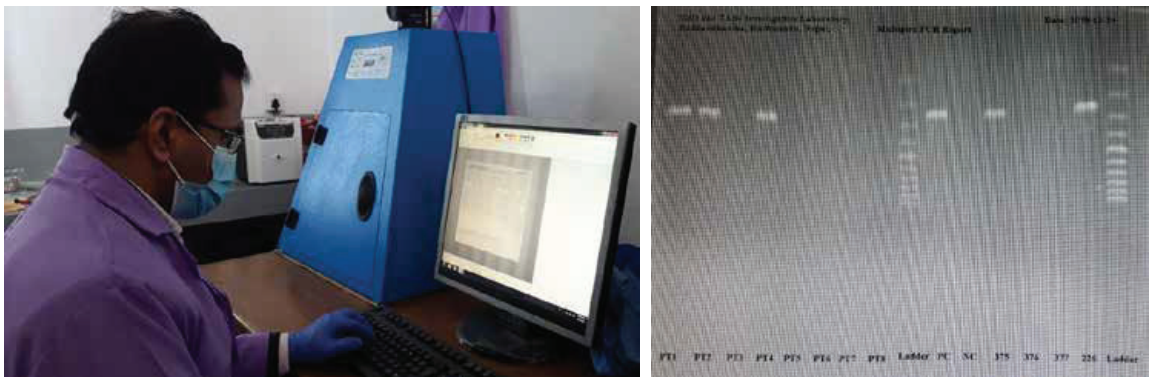


Fig: Diagnosis of FMD by conventional Multiplex RT-PCR

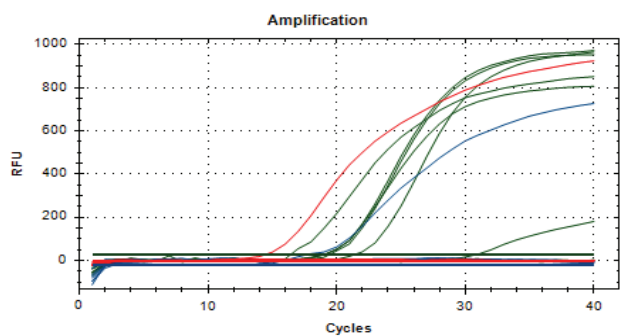


Fig: Diagnosis of FMD by Real Time Multiplex RT-PCR

Some glimpses of Interactive programs regarding FMD & TADs and Training programs regarding sample collection, preservation and dispatch conducted by FMD & TADs lab in FY 2080/81



Fig: FMD & TADs related interactive program at VHLSEC, Manang



Fig: FMD & TADs related interactive program at VHLSEC, Kavrepalanchowk



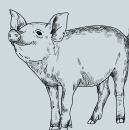
Fig: Sample collection, preservation and dispatch training for field veterinarians, VHLSEC, Chitwan



Fig: Sample collection, preservation and dispatch training for field veterinarians, VHLSEC, Gulmi

Some glimpses of inauguration of BSL 2 plus lab constructed for FMD & TADs Investigation Laboratory by Nepal Livestock Sector Innovation Project (NLSIP)





FMD Vaccination Schedule



FMD Vaccination	Cattle, Buffalo, Sheep, Goat	Pig
1 st Vaccination	4 month old	2 month old
Booster vaccination	1 month after 1 st Vaccination	1 month after 1 st Vaccination
Re-vaccination	Every 6 month	Every 6 month
The vaccine should be administered deep I/M . Vaccine dosage should be followed as per the manufacturer's guidelines.		

Sample collection for laboratory diagnosis

Disease	Appropriate Sample	Collection and Dispatch
Foot and Mouth Disease (FMD)	Vesicular fluids, skin epithelia around ruptured vesicles on the mouth, tongue, gums, and interdental space of hooves	50% Phosphate Buffer Glycerin media. Dispatched in Cool box with Ice packs
	Heart, Spleen, Lymph nodes etc from dead animal	In a sterile bottle or zip lock bag. Dispatched in Cool box with Ice packs
Classical Swine Fever (CSF)	Serum	In serum vial dispatched in a Cool box with Ice packs
	Lymph nodes, Spleen, Lungs, Liver etc from dead animal	In a sterile bottle or zip lock bag. Dispatched in a Cool box with Ice packs
Blue Tongue (BT)	Serum	In serum vial dispatched in a Cool box with Ice packs
	Lymph nodes, Spleen, Lungs, Liver etc from dead animal	In a sterile bottle or zip lock bag. Dispatched in a Cool box with Ice packs

CSF Vaccination Schedule

All pigs **above 6 weeks of age** should be vaccinated according to the dosage recommended by the manufacturer, and revaccination should be performed annually.

Services at FMD & TADs Investigation Laboratory

Molecular Detection

Real Time Multiplex Reverse Transcriptase PCR
Conventional Reverse Transcriptase PCR
FMD Ag Detection and Serotyping ELISA

FMD, CSF, BT diagnosis

FMD Diagnosis

Serology

FMD NSP ELISA
FMD SP ELISA
Classical Swine Fever Antibody ELISA
Blue Tongue Antibody ELISA

Serosurveillance of FMD
Seromonitoring of FMD
Serosurveillance and Seromonitoring of CSF
Serosurveillance and Seromonitoring of CSF

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