

Annual Technical Report

2077/078 (2020/21)



Government of Nepal

Ministry of Agriculture & Livestock Development

Department of Livestock Services

Central Veterinary Laboratory

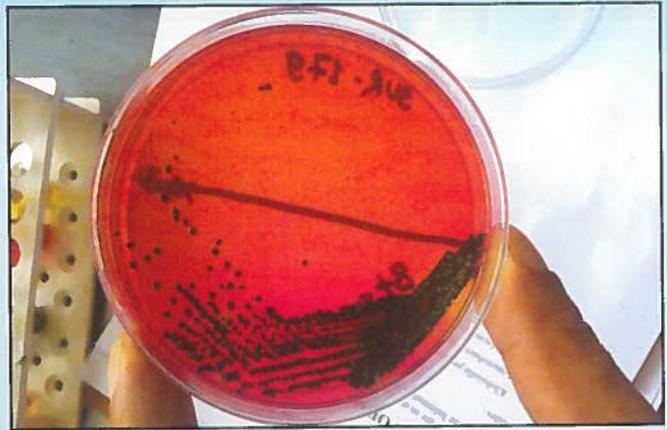
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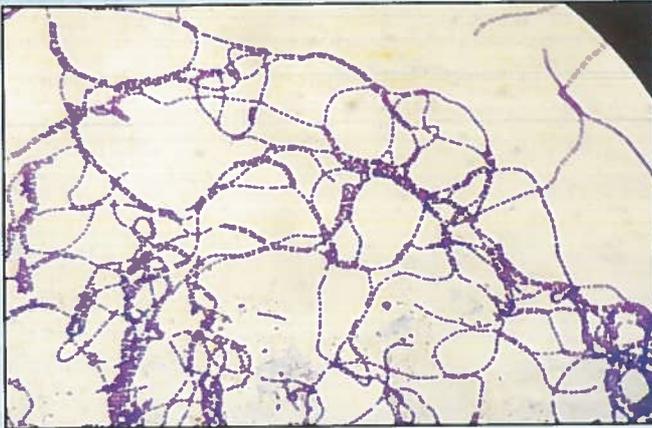
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Testing for ESBL E. coli



Salmonella isolates in MCA



Streptococcus spp in gram stain



Splenomegaly in pig infected with ASF



RDT testing for ASF



Brain sample collection for Rabies testing from dog



Fluorescent Antibody Testing for Rabies Confirmation



Preparation of mastermix for PCR

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Foreword

It is my pleasure to present this annual technical report of Central Veterinary Laboratory (CVL) for the fiscal year 2077/78 (2020/21). This issue includes activities and progress report of CVL and five Veterinary Laboratories (VLs) under CVL.

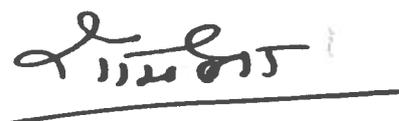
Diagnosis of diseases is a foundation for control, prevention and its eradication. Early and accurate diagnosis of diseases can only be assured in the laboratories which are fully equipped, that have a range of standardized diagnostic reagents and trained human resources.

Nepal being the member of World Trade Organization (WTO), since 2004, has to implement Sanitary and Phytosanitary (SPS) measures on scientific merit. Laboratory based diagnosis is of paramount importance in implementing the SPS measures in the territory. Therefore, the role of central and veterinary laboratories including basic laboratories situated in the local level is crucial in diagnosis of disease among major livestock species in the country. Yet, there is a scope in uplifting the standards and quality assurance of the laboratory diagnosis process conducted utilizing existing facilities.

With the establishment of molecular diagnostic techniques at the CVL, routine molecular diagnosis of Avian Influenza, ND, IBD, PPR and application multiplex PCR technology for the diagnosis of diseases of small ruminants and swine are being performed. Similarly, the ELISA, FAT, HA/HI and characterization and other routine diagnostic tests are used for the diagnosis of various livestock and poultry diseases. Apart from routine testing in the bacteriology, CVL has recently started the active Antimicrobial Resistance (AMR) surveillance program in collaboration with the Veterinary Laboratories and National Avian Disease Diagnosis Laboratory, Chitwan with the logistic support from the Fleming Fund Country Grant, Nepal. Similarly, the program on the surveillance of ESBL E. coli is being implemented with the logistic support from WHO. In public health section of CVL, the surveillance of antibiotic residue in meat and milk of animals with the application of ELISA has been started since FY 2075/76.

In meantime, we are putting our efforts to upgrade CVL, VLs and collaborate with National Avian Disease Diagnosis Laboratory (NADIL) to provide reliable and prompt diagnostic services all over the country. We already have good co-ordination among the veterinary laboratories, provincial veterinary offices and local units to ensure the quality sample flow for advance diagnosis up to CVL, it being a national reference laboratory in the nation.

I would like to extend my sincere thanks to Food and Agriculture Organization (FAO) for their support in laboratory diagnostic reagents, Australian Animal Health Laboratory (AAHAL) for their molecular characterization of different viruses, and International Atomic Energy Agency (IAEA) lab for their support in Proficiency Testing and laboratory trainings. Sincere efforts of all VLs for providing information required for this publication is appreciable. Finally, I would express my personal appreciation and sincere thanks to all the staffs of CVL who worked hard to give this annual technical report in a good shine.



.....
Dr. Sharmila Chapagain Kafle
Chief Veterinary Officer
Central Veterinary Laboratory
Tripureshwor, Kathmandu, Nepal

Abbreviations:

AI	Avian Influenza
ALC	Avian Leucosis Complex
AMR	Anti-Microbial Resistance
AST	Antibiotic Sensitivity Test
CFT	Complement Fixation Test
CMT	California Mastitis Test
CS	Cloacal swab
CSF	Classical Swine Fever
CVL	Central Veterinary Laboratory
DLS	Department of Livestock Services
ELISA	Enzyme Linked Immunosorbent Assay
EPG	Egg per Gram
EQA	External Quality Assurance
ES	Environmental swab
ESBL	Extended Spectrum Beta Lactamase
FAO	Food and Agriculture Organization.
FAT	Fluorescent Antibody Test
FMD	Foot and Mouth Disease
GLP	Good Laboratory Practice
HA	Haemagglutination
HI	Haemagglutination Inhibition
HPAI	Highly Pathogenic Avian Influenza
IAEA	International Atomic Energy Agency
IB	Infectious Bronchitis
IBD	Infectious Bursal Disease
MoALD	Ministry of Agriculture and Livestock Development
NADIL	National Avian Disease Investigation Laboratory
ND	New Castle Disease
NPHL	National Public Health Laboratory
NS	Nasal swab
PPR	Peste des petits Ruminants
rRT PCR	Real Time Reverse Transcriptase Polymerase Chain Reaction
SOP	Standard Operating Procedure
SPS	Sanitary and Phyto Sanitary Standard
TS	Tracheal swab
UTI	Urinary Tract Infection
VLs	Veterinary Laboratories
WOAH (OIE)	World Organization for Animal Health
WTO	World Trade Organization

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CENTRAL VETERINARY LABORATORY

KATHMANDU

1. Introduction

Central Veterinary Laboratory (CVL) focuses program with the objective of securing healthy national herd of livestock throughout the nation by mitigating the occurrence of diseases of livestock and poultry. CVL also works on epidemic investigation as well as surveillance and investigation on various diseases in its approved annual program. The direct benefit of the performance of various laboratories has been experienced in the field of veterinary medical care based on valid laboratory test results. To achieve these multidimensional activities, CVL works with a series of laboratory test procedures through its various laboratory sections; Pathology, Microbiology, Laboratory Data Management, Biosecurity and Quality Control, Veterinary Public Health and Lab and Molecular Biology with a considerable progress in the later.

CVL has Standard Operating Procedures, test protocols and quality guideline manual. CVL is gradually practicing the biosafety/ biosecurity measures so that Good Laboratory Practice is followed in all the diagnostic laboratories. CVL has already been adopting test verification system through international reference laboratories which will help in the accreditation of CVL for international certification in near future. The newly constructed well equipped BSL2+ laboratory will certainly help to increase the standard of test results and accreditation process as well.

To provide diagnostic facilities throughout the country, CVL works through its five Veterinary Laboratories (VLs) located in different provinces of the nation; Province No 1 Veterinary Laboratory (Biratnagar), Madhesh Pradesh Veterinary Laboratory (Janakpur), Gandaki Pradesh Veterinary Laboratory (Pokhara), Karnali Pradesh Veterinary Laboratory (Surkhet) and Sudurpashim Pradesh Veterinary Laboratory (Dhangadhi). Currently, Bagmati Pradesh and Lumbini Pradesh do not have veterinary laboratory as per new structure. However, diagnostic services are covered by the currently running laboratories. Specimens that cannot be processed in the aforementioned laboratories due to insufficient facilities and expertise or needed to be further tested for confirmation are referred to the CVL. Local level in coordination with veterinary diagnostic laboratories also send samples to the CVL for confirmatory diagnosis. In this way, CVL works as a reference veterinary laboratory in Nepal.

2. Objectives

The role of veterinary laboratory system has become dynamic with advent of food safety issues, economic liberalization and trade globalization. Nepal joined as a WTO member in 2004. Therefore, Nepal follows the guidelines provided by World Organization for Animal Health (WOAH) for the provision of Sanitary and Phytosanitary (SPS) agreement under WTO that seeks scientific procedures and evidence in the course of disease diagnosis as well as production chain. The roles of veterinary diagnostic laboratories are now therefore expanded and challenging in the new context. Moreover, CVL works with the following objectives in the country.

- ❖ Provide laboratory diagnostic services in the country in the area of animal health and veterinary public health.
- ❖ Acts as a national veterinary reference laboratory.
- ❖ Conduct epidemiological disease investigation & laboratory diagnosis of livestock and poultry disease.
- ❖ Support the national disease control and surveillance programs.
- ❖ Acquire, adopt, upgrade and disseminate different laboratory diagnostic test methodologies for livestock and poultry diseases.
- ❖ Assist Department of Livestock Services (DLS) in the animal health policy development and formulation of animal disease control and eradication programs.
- ❖ Extend & disseminate information concerning livestock and poultry disease controls.
- ❖ Collaborate with international reference laboratories & institutions on veterinary laboratory diagnosis.
- ❖ Assist in implementation of national epidemic control strategies.
- ❖ Conduct laboratory diagnosis techniques training for the veterinarians and veterinary paraprofessionals.
- ❖ Strengthen and coordinate veterinary laboratories all across the nation.
- ❖ Conduct various programs to address public health issues such as veterinary drug residue testing, meat shop monitoring, insecticides/hormones/pesticides testing in milk, egg & meat.

3. Organization Structure

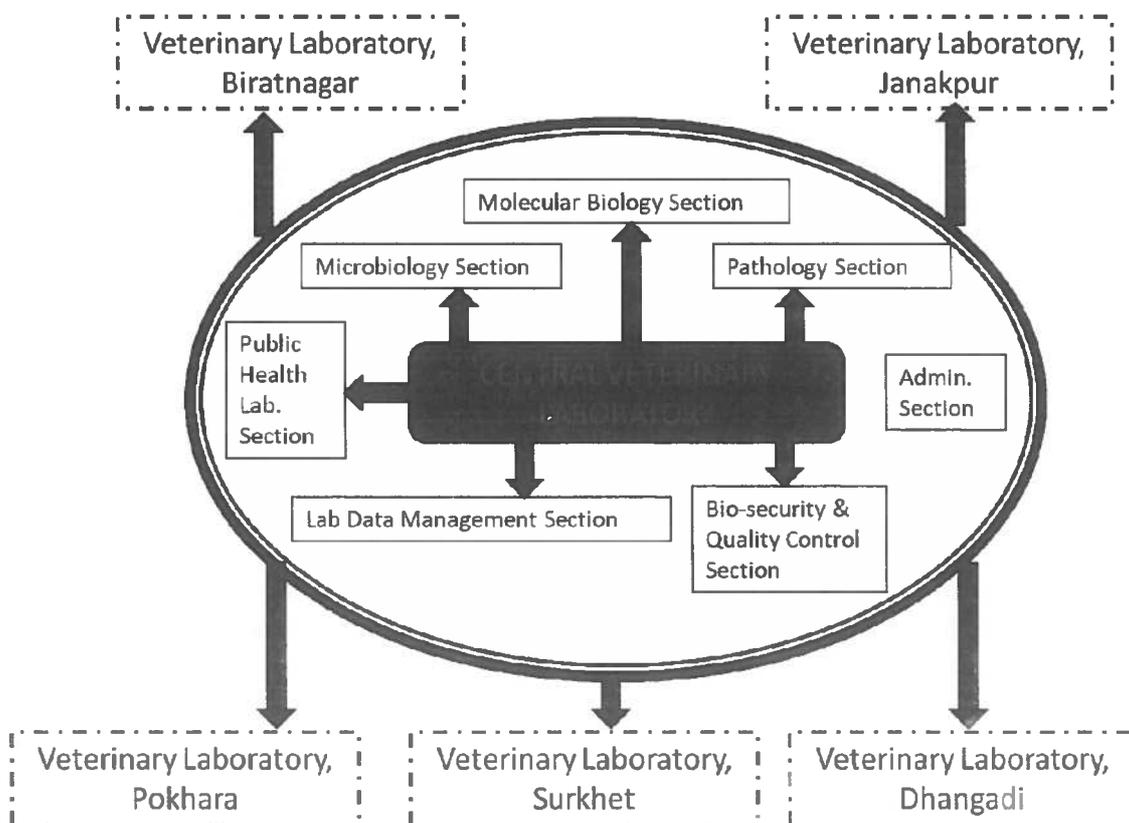


Table: List of Staffs working at CVL (F/Y 2077/78)

S.N.	Name	Position	Total Number	Fulfilled
1		Chief Veterinary Officer	1	0
2	Dr. Salina Manandhar	Senior Veterinary Officer	4	4
3	Dr. Pragya Koirala			
4	Dr. Rajesh Yadav			
5	Dr. Ram Chandra Sapkota			
6	Mr. Purna Bahadur Budha	Veterinary Officer	12	12
7	Mr. Prakash Devkota			
8	Mr. Bal Bahadur Kunwar			
9	Mr. Tek Bahadur Aire			
10	Mr. Dhan Raj Rai			
11	Dr. Tulsi Ram Gompo			
12	Dr. Manju Maharjan			
13	Dr. Nabaraj Shrestha			
14	Dr. Luna Gongal			
15	Dr. Chanda Shrestha			
16	Dr. Prativa Shrestha			
17	Dr. Suraj Subedi			
18	Mr. Hari Lal Kandel	Animal Health Technician	8	8
19	Mr. Krishna Mani Kafle			
20	Mr. Mithilesh Karn			
21	Ms. Sunita Adhikari			
22	Mr. Sudeep Kafle			
23	Ms. Kamal Kumari Niraula			
24	Ms. Rita Dahal			
25	Ms. Surya Kumari Dhami			
26	Mr. Bhimsen Adhikari	Assistant Animal Health Technician	4	1
27	Mrs. Devi Dhungana	Accountant	1	1
28	Mrs. Sushma Pokhrel	Non-gazetted first class	1	1
29	Mr. Jeevan Rai	Computer Operator (Contract)	1	1
30	Mr. Damber Timilsina	Driver	2	2
31	Mr. Kumar Nagarkoti			
32	Mr. Dipesh Rana Magar	Driver (Contract)	1	
33	Ms. Devaki Rimal	Office Assistant	6	6
34	Mrs. Bheema Acharya			
35	Mr. Chandra Bahadur Rana			
36	Ms. Yam Kumari Rai			
37	Ms. Laxmi Adhikari			
38	Mr. Dik Kumar Magar			
	Total		39	35

5. Laboratory Services

5.1 Microbiology section

Microbiology section consist of 2 units viz Bacteriology & mycology unit and Virology unit.

5.1.1 Bacteriology and mycology unit

Bacteriology unit

In the fiscal year 2077/78, the bacteriology unit received 981 samples from various sources such as farms, central veterinary referral hospitals, private clinics, veterinary laboratories, veterinary hospitals, and livestock service expert centers, and directly from the field-collected during the periodic sampling. The sample received were three types: i) the general samples that include urine, blood, nasal swabs, ear swabs, skin scrapping of animals, tissues of animals collected during postmortem examination, and the animal feed iii) milk samples from the sick dairy animals iii) the environment samples, mainly water. Out of the total 525 general samples, 439 (83.61%) showed bacteria, and out of 291 milk samples, 192 (65.97 %) showed bacterial growth on culture. And of the 18 water samples submitted, 16 (88.89%) samples had bacterial growth in the lab. The description of various bacteria isolated in general, milk, and water samples is shown in tables below.

Table: The bacterial species isolated from general samples submitted to CVL in F/Y 2077/78 (2020-21)

S.N.	Bacterial spp.	No of isolates
1	E. coli	281
2	Klebsiella spp.	11
3	Cocobacillus	1
4	Enterococcus spp.	4
5	Pseudomonas spp.	10
6	Salmonella spp.	97
7	Bacillus spp.	1
8	Shigella	1
9	Micrococcus spp.	1
10	Proteus spp.	13
11	Acinetobacter spp.	8
12	Aeromonas	9
13	Serratia	1
14	Vibrio	1
	Total	439

Table: Bacterial species isolated from milk samples submitted to CVL in the F/Y 2077/78 (2020-21)

S. No.	Bacterial spp.	No of isolates
1	Staphylococcus spp.	97
2	E. coli	57
3	Klebsiella spp.	11
4	Streptococcus spp.	9
5	Enterococcus spp.	4
6	Bacillus spp.	3
7	Micrococcus spp.	3
8	Acinetobacter	1
9	Haemophilus	2
10	Lactobacillus	1
11	Moraxella	4
Total		192

Table: Bacterial species isolated from water samples submitted to CVL in the F/Y 2077/78 (2020-21)

S.No.	Bacterial spp.	No of isolates
1	<i>E. coli</i>	9
2	<i>Acinetobacter</i>	3
3	<i>Hafnia</i>	1
4	<i>Aeromonas spp.</i>	3
Total		16

Mycology

A total of 20 feed samples were received in mycological unit for fungal culture and among them only 10 samples were found positive to the fungal growth. One of the most common fungus isolated from the poultry feed were penicillium and aspergillus species.

Table: The fungal species isolated in the laboratory in the F/Y 2077/78

S.N.	Fungal species	Number of isolated
1.	Penicillum	2
2.	Aspergillus	5
3	Yeast	3
Total		10

Antimicrobial Susceptibility Testing (AST)

All the bacteria isolated from the culture were routinely tested for their antimicrobial susceptibility by disc diffusion methods. The antibiotics against each isolate was matched according to Clinical

and Laboratory Standard Institute (CLSI) guidelines, 2018. Among the antibiotics, Gentamycin, Ceftriaxone, Ciprofloxacin, Gentamicin have intermediate in action in most of the bacterial isolate. While Imipenem and Ceftriaxone were sensitive to all isolates including to *E. coli*. Tetracyclines and Amoxicillin has least sensitivity against many bacterial isolates. The detail illustrations of AST are shown in the Table below.

Table: Antibiotic susceptibility test result against common bacterial isolated from general sample in the F/Y 2077/78

S.N	Bacterial species	Antibiotic susceptibility (%)										
		GEN	AK	CIP	AMX	AP	T	C	FOX	CRO	COT	IMI
1	<i>Escherichia coli</i>	48.7	80.12	30	13.7	32	13.3	38.98	79.68	85.4	44.9	95.61
2	<i>Klebsiella spp.</i>	25	65.7	45.2	25	27.4	24.9	50.3	43.8	80.8	20	94.4
3.	<i>Enterobacter spp.</i>	60	77.77	62.5	NA	33	22.72	44.44	NA	80	NA	99
4.	<i>Enterococcus spp.</i>	46.66	NA	50	27.27	NA	NA	NA	85.71	71.42	28.57	91.66
6.	<i>Salmonella spp.</i>	56	75	86.66	50	58	60	75	66.66	83.33	NA	85.71
7.	<i>Staphylococcus spp.</i>	42.4	31.5	46	71	33	75.3	57	25	71	NA	90

Note: GEN=Gentamycin, AK=Amikacin, CIP=Ciprofloxacin, AMX=Amoxicillin, AP=Ampicillin, T=Tetracycline, C= Chloramphenicol, FOX= Cefoxitin, CRO= Ceftriaxone, COT = Cotrimoxazole, CRO= Ceftriaxone, IMI = Imipenem, NA = Not applicable

Milk sample

Mostly the milk samples were the walk-in samples submitted by the farmer themselves. Of 291 milk, 192 (65.97%) milk samples produce bacteria which subsequently were subjected to antibiotic sensitivity test with different antibiotic panels. The detail description is depicted on Table below.

Table: Antibiotic susceptibility test against the bacterial isolated from milk sample isolated in F/Y 2077/78

S.N.	Bacterial species	Antibiotic susceptibility (%)										
		GEN	AK	CIP	CTZ	PNG	T	C	FOX	CRO	IMI	VA
1	<i>Staphylococcus spp.</i>	85.5	76.5	73.53	91.2	33.34	38.6	66.67	NA	84.9	96.66	21
2	<i>E. coli</i>	54.54	65	73.53	80	53.34	NA	100	20	NA	NA	NA
3	<i>Klebsiella spp.</i>	75	50	71.42	100	NA	60	100	NA	NA	NA	100
4	<i>Streptococcus</i>	60	NA	100	NA	NA	16.67	NA	NA	NA	NA	NA

Note: GEN=Gentamycin, AK=Amikacin, CIP=Ciprofloxacin, T=Tetracycline, C= Chloramphenicol, FOX= Cefoxitin, CRO= Ceftriaxone, CRO= Ceftriaxone, VA= Vancomycin, PNG= Penicillin G, CTZ= NA = Not applicable.

Antimicrobial resistance related activity in Central Veterinary Laboratory

Antimicrobial resistance (AMR) is one of the major global challenges of both public and animal health. CVL is the national reference laboratory for the AMR surveillance from animal health aspects. There has been a collaboration with CVL and NPHL for the laboratory training. As a part of quality assurance, CVL takes part in External Quality Assessment (EQA), and quarterly receive unknown bacterial strains from NPHL for isolation, identification, and antimicrobial susceptibility test reporting. Along with this, CVL participates in EQA with Mahidol University, Thailand and Chulalongkorn university, Thailand in collaboration with Denmark Technical University (DTU) quarterly in year 2020 to 2021. CVL also provide EQA system among the veterinary laboratories within the country.

In recent years, the Fleming Fund Country Grant in Nepal (FFCGN) supported CVL in capacity building through human resources training, infrastructure development. FFCGN also assisted in the laboratory document preparation, such as surveillance plans and guidelines. As a part of this support, CVL has initiated a program for active AMR surveillance program in poultry fecal and cecal samples since 2020. The main targeted bacteria for the surveillance are *E coli*, *Salmonella*, *Enterococcus*, and *Campylobacter spp.* CVL is leading the active surveillance activity, and three VL of Biratnagar, Pokhara, and the National Avian Disease Investigation Laboratory (NADIL), Chitwan, are participating in the program aimed to be completed in 2022.

In addition, the microbiology unit of CVL is participating the WHO tricycle project on Extended Spectrum *E. coli* (ESBL)-Animal health component in collaboration with NPHL focusing the resistance patterns of ESBL *E. coli* in healthy chicken through One Health approach.

5.1.2 Virology unit

This unit is responsible for the diagnosis of viral diseases. Most of the samples are submitted from the postmortem unit of CVL, Veterinary Laboratories in different provinces, NADIL, Central Referral Veterinary Hospital (CRVH) and Veterinary Hospital and Livestock Services Expert Center (VHLSEC). Samples are also submitted by quarantine check posts, private clinicians, farmers, and staffs of CVL during disease outbreak investigations. The unit has a facility for competitive ELISA, Fluorescent Antibody Test, Plate Agglutination Test and rapid antigen detection test. Mainly, rapid antigen detection test is used for the initial diagnosis of Avian Influenza, New Castle Disease, Infectious Bursal Disease, Infectious Bronchitis and Rabies. For the further confirmative diagnosis of Avian Influenza, the samples are sent to the Molecular Section. Likewise, for rabies the confirmative diagnosis is done through histopathological test (Negri body detection) and Fluorescent Antibody Test (FAT).

In the fiscal year 2077/78, a total of 2086 samples were tested by rapid test kit method.

Table: Rapid test record for FY 2077/78

Rapid Test Record 2077/78													
Month	ND			AI			IBD			IB			Total
	Pos	Neg	Total	Pos	Neg	Total	Pos	Neg	Total	Pos	Neg	Total	
Shrawan	2	29	31	0	35	35	10	22	32	4	17	21	119
Bhadra	2	1	3	0	4	4	3	0	3	1	4	5	15
Ashwin	2	27	29	0	39	39	14	22	36	3	24	27	131
Kartik	2	10	12	1	19	20	4	7	11	2	10	12	55
Mangsir	8	20	28	6	35	41	11	19	30	4	15	19	118
Poush	27	38	65	11	67	78	6	22	28	5	8	13	184
Magh	62	61	123	21	114	135	7	5	12	0	5	5	275
Falgun	81	80	161	12	147	159	9	11	20	1	9	10	350
Chaitra	84	69	153	5	175	180	16	12	28	1	7	8	369
Baisakh	44	24	68	12	102	114	12	24	36	3	13	16	234
Jestha	21	13	34	5	44	49	3	4	7	0	5	5	95
Ashad	15	35	50	1	62	63	6	10	16	2	10	12	141
Total	350	407	757	74	843	917	101	158	259	26	127	153	2086

Rabies diagnosis

In the fiscal year 2077/78, 62 rabies suspected samples were tested out of which 32 (51.61%) were found to be positive. Most of the samples received were of canine.

Table: Species wise distribution of rabies tested in CVL (2077/778)

Month	Canine		Bovine		Caprine		Feline		Total Tests	Total Positive
	Total	Positive	Total	Positive	Total	Positive	Total	Positive		
Shrawan	17	9	1	1	0	0	1	1	19	11
Bhadra	2	2	0	0	0	0	0	0	2	2
Ashwin	2	2	1	0	2	0	0	0	5	2
Kartik	3	1	0	0	0	0	0	0	3	1
Mangsir	2	2	0	0	1	0	0	0	3	2
Poush	5	5	0	0	1	0	0	0	6	5
Magh	3	1	2	1	1	0	0	0	6	2
Falgun	2	2	0	0	1	0	0	0	3	2
Chaitra	2	1	2	2	1	1	0	0	5	4
Baisakh	1	0	0	0	1	0	0	0	2	0
Jestha	1	0	1	0	1	0	0	0	3	0
Ashad	4	1	0	0	1	0	0	0	5	1
Total	44	26	7	4	10	1	1	1	62	32

5.2 Pathology Section

Pathology section consists of postmortem unit, histopathology, parasitology and clinical hematology and biochemistry unit. Samples are submitted either by VLs, NADIL, CRVH, VHLSEC and Local level or they are brought directly by the veterinary practitioners, livestock, and poultry farms as well as by the farmers themselves.

5.2.1 Postmortem unit

Necropsy examination is the first step of disease diagnosis for morbid animals. The history, clinical findings, epidemiological surveillance information is also helps for the proper diagnosis of disease which is confirmed through various tests that are available in CVL.

During the fiscal year 2077/78, a total of 1772 animal farmers, including 1712 poultry farmers and 60 animal farmers had brought their dead animals and birds for necropsy examination at CVL. Detail month wise and species wise distribution is shown in the table below.

Table: Month-wise distribution of different suspected disease in animals brought for PM (FY 2077-78)

S.N.	Disease/ Pathological conditions	Shrawan	Bhadra	Ashwin	Kartik	Mangsir	Poush	Magh	Falgun	Chaitra	Baisakh	Jestha	Ashad	Total	
1	Bacterial	Anthrax	0	0	0	0	0	0	0	0	0	1	0	1	
2		CCPP	0	0	0	0	0	1	0	0	0	0	0	1	
3		Enterotoxaemia	0	1	1	0	0	0	0	0	0	0	0	2	4
4		Hemorrhagic Septicemia	0	0	0	0	0	0	0	0	0	0	0	1	1
5		Pneumonia	1	0	3	1	1	3	0	1	1	2	0	2	15
6	Viral	Classical Swine Fever	2	0	0	0	0	0	0	0	0	1	0	3	
7		PPR	0	0	0	0	0	2	0	1	0	2	0	5	
8		PRRS	0	0	0	0	0	1	0	0	0	0	0	1	
9		Rabies	0	0	0	0	2	1	2	0	0	0	0	5	
10	Parasitic	Babesia	0	0	0	0	0	0	0	0	1	0	0	1	
11	Other	Ascites	0	0	0	0	0	1	0	0	0	0	0	1	
12		Jaundice	0	0	0	0	0	0	0	0	0	0	0	1	1
13		Pregnancy toxaemia	0	0	0	0	0	0	0	0	0	1	0	1	2
14		Renal failure	0	0	0	0	0	0	0	0	0	0	0	1	1
15		Others	0	0	1	1	3	1	2	0	2	1	4	3	18
Total		3	1	5	2	6	10	4	2	3	7	6	11	60	

**Table: Species wise distribution of pathological condition diagnosed by PM in CVL
(FY 2077/78)**

Animal	Disease	No of cases
Buffalo	Rabies	1
	Others	1
Dog	Rabies	4
	Renal failure	1
	Others	5
Goat	Ascites	1
	CCPP	1
	Enterotoxaemia	4
	Jaundice	1
	Pneumonia	11
	PPR	5
	Pregnancy Toxaemia	2
	Others	11
Pig	Anthrax	1
	Babesia (Smear positive)	1
	Classical Swine Fever	3
	Hemorrhagic Septicemia	1
	Pneumonia	2
	PRRS	1
Rabbit	Pneumonia	2
Avian	Details in table below	1712
Total		1772

Table: Month-wise distribution of pathological conditions of avian species diagnosed by PM in CVL (FY 2077-78)

S. N.	Disease/ Pathological Conditions	Shrawan	Bhadra	Ashwin	Kartik	Mangsir	Poush	Magh	Falgun	Chaitra	Baisakh	Jestha	Ashad	Total	
1	Bacterial	Chronic Respiratory Disease (CRD)	10	0	10	4	8	23	8	21	19	7	5	18	133
2		Colibacillosis	29	4	37	12	27	30	36	43	43	39	18	23	341
3		Complicated CRD	16	1	20	8	19	14	3	24	36	17	1	7	166
4		Fowl Cholera	0	0	0	0	0	2	0	1	2	0	0	1	6
5		Infectious Coryza	2	0	1	0	0	0	0	0	0	0	0	1	4
6		Necrotic Enteritis	0	0	1	2	2	2	1	0	2	1	0	1	12
7		Omphalitis	2	0	1	0	6	3	2	2	1	1	1	1	20
8		Salmonellosis (Fowl Typhoid/ Pullorum)	5	1	10	2	5	9	6	4	8	5	3	2	60
9	Viral	Avian Leukosis Complex	2	0	2	4	5	2	0	2	6	0	0	1	24
10		Avian Influenza	0	0	0	2	8	13	20	10	5	9	5	1	73
11		Fowl Pox	0	0	0	0	0	0	0	0	0	1	0	1	2
12		Infectious Bronchitis	3	2	2	2	2	4	0	1	1	1	0	2	20
13		Infectious Bursal Disease	13	3	16	4	9	4	7	7	16	15	3	8	105
14		Marek's Diseases	1	0	2	3	6	4	7	1	3	0	0	4	31
15		New Castle Disease	2	2	1	2	9	26	53	85	91	57	20	15	363
16	Parasitic	Coccidiosis	2	1	7	3	2	4	2	1	5	1	4	3	35
17		Histomoniasis	5	1	6	3	3	1	0	4	1	1	1	2	28
18		Roundworm	5	0	2	1	3	3	6	3	2	2	0	4	31
19	Others	Mycotoxicosis	29	1	31	19	30	54	34	39	56	33	18	28	372
20		Ascites	6	0	10	8	13	21	6	9	8	3	2	1	87
21		Gout	1	0	1	0	2	1	5	0	9	5	1	3	28
22		Miscellaneous problems	32	1	14	15	18	16	19	22	26	28	10	25	226
Total		1617	174	94	177	236	215	279	340	226	92	152	2167		

Note: Miscellaneous problems include: Urolithiasis, non-specific pneumonia, nephritis, heat stress, sudden death syndrome, suspected poisoning, management problems, injury, non-specific deaths, fatty liver syndrome, fatty liver hemorrhagic syndrome etc.

skin scrapings samples are collected and examined by adopting standard veterinary laboratory protocols. As a routine examination or diagnosis of parasites, direct smear method, sedimentation method and the floatation methods are used. During FY 2077-78 a total 443 faecal samples and 96 skin scrapings were tested and the result of laboratory findings is listed in table below.

Table: Parasites identified during the fiscal year 2077/78

Month	Species	Total no of sample	Sample tested	Test Method	Result		Remarks
					Pos.	Neg	
Shrawan 2077	Cattle	71	Faecal sample	Sedimentation	29	42	Liver fluke
					8	63	<i>Paramphistomum</i>
	Buffalo	1	Faecal sample	Sedimentation	1	0	Liver fluke
	Goat	7	Faecal sample	Sedimentation	2	5	<i>Strongylus</i>
					1	6	<i>Trichuris</i>
	Dog	11	Faecal sample	Sedimentation	2	9	<i>T. canis</i>
11		Skin scraping	KOH test	2	9	<i>Demodex canis</i>	
Pig	1	Faecal sample	Sedimentation	1	0	<i>Ascaris</i>	
Bhadra 2077	Cattle	9	Faecal sample	Sedimentation	2	7	Liver fluke
					4	5	<i>Paramphistomum</i>
	Dog	4	Skin scraping	KOH test	0	4	
Ashwin 2077	Cattle	91	Faecal sample	Sedimentation	16	75	Liver fluke
					25	66	<i>Paramphistomum</i>
	Buffalo	1	Faecal sample	Sedimentation	0	1	
	Goat	22	Faecal sample	Sedimentation	4	18	<i>Strongylus</i>
	Dog	14	Skin scraping	KOH test	5	9	<i>D. canis</i>
	Pig	5	Faecal sample	Sedimentation	1	4	<i>Ascaris</i>
Kartik 2077	Cattle	11	Faecal sample	Sedimentation	1	10	Liver fluke
					1	10	<i>Paramphistomum</i>
	Buffalo	1	Faecal sample	Sedimentation	1	0	<i>T. vitulorum</i>
	Goat	1	Faecal sample	Sedimentation	1	0	<i>Strongylus</i>
	Dog	6	Skin scraping	KOH Test	2	4	<i>D. canis</i>
	Pig	3	Faecal sample	Sedimentation	3	0	<i>Ascaris</i>
Mangsi r 2077	Goat	11	Faecal sample	Floatation	3	8	<i>Trichuris,</i> <i>Strongylus</i>
		11	Faecal sample	Sedimentation	0	11	
	Dog	8	Skin scraping	KOH test	1	7	Demodex
		6	Faecal sample	Sedimentation , floatation	2	4	<i>Ascaris, Capillaria</i>

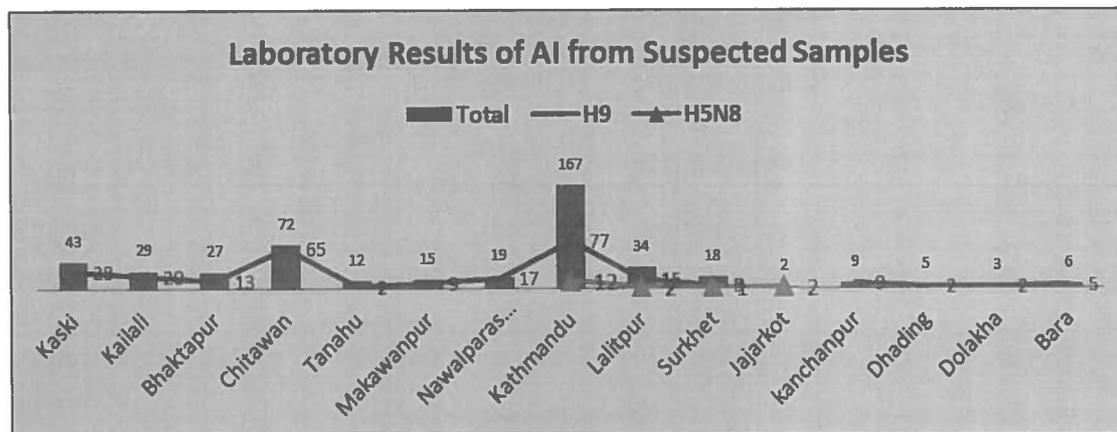
Month	Species	Total no of sample	Sample tested	Test Method	Result		Remarks
					Pos.	Neg	
	Pig	4	Faecal sample	Sedimentation	0	4	
Poush 2077	Cattle	10	Faecal sample	Sedimentation	4	6	Liver fluke, <i>Paramphistomum</i>
	Dog	3	Skin scraping	KOH test	2	1	Demodex
	Pig	1	Faecal sample	Floatation	1	0	<i>Moniezia</i>
Magh 2077	No sample received						
Falgun 2077	Pig	4	Faecal sample	Floatation	2	2	<i>Ascaris, Strongylus</i>
	Dog	11	Skin scraping	KOH test	7	4	Demodex
Chaitra 2077	Cattle	20	Faecal sample	Sedimentation	13	7	Liver Fluke, <i>Paramphistomum</i>
	Goat	40	Faecal sample	sedimentation, Floatation	23	17	Liver fluke, <i>Paramphistomum, Strongylus, Trichuris, Coccidiosis, Capillaria</i>
	Avian	3	Faecal sample	Sedimentation	3	0	Coccidiosis
	Dog	13	Skin scraping	KOH test	6	7	Demodex
Baisakh 2078	Cattle	15	Faecal sample	Sedimentation	7	4	Liver fluke, <i>Paramphistomum</i>
	Goat	30	Faecal sample	Floatation, Sedimentation	0	30	
	Dog	7	Skin scraping	KOH test	4	3	Demodex
	Avian	4	Faecal sample	Sedimentation	3	1	Coccidiosis
Jestha 2078	Dog	11	Skin scraping	KOH test	6	5	Demodex
	Avian	6	Faecal sample	Sedimentation	4	2	Coccidiosis
Ashad 2078	Cattle	37	Faecal sample	Sedimentation, Floatation	19	18	Liver fluke, <i>Paramphistomum, Strongylus</i>
	Goat	4	Faecal sample	Sedimentation, Floatation	3	1	Liver fluke, <i>Paramphistomum, Strongylus</i>
	Pig	1	Faecal sample	Sedimentation	1	0	Coccidiosis
	Dog	1	Faecal sample	Direct Smear	1	0	<i>Toxocara</i>
		8	Skin scraping	KOH test	5	3	Demodex

5.3 Molecular Biology Section

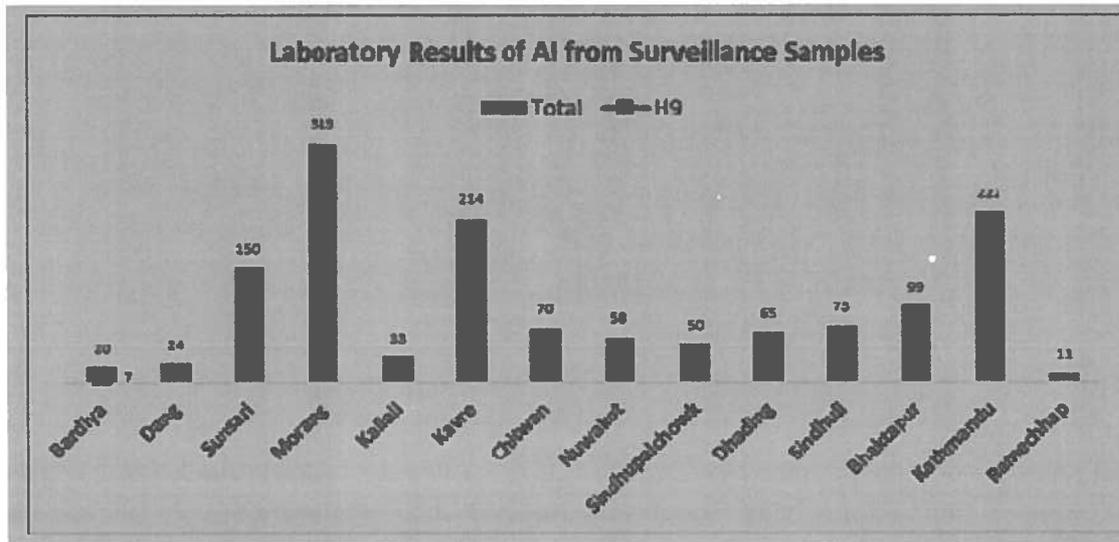
5.3.1 Molecular Biology Unit

CVL started PCR testing to diagnose avian influenza by using RT-PCR technique since 2003. From 2010, CVL started real time PCR for diagnosis of avian diseases like Avian Influenza (AI), Newcastle disease (ND), and Infectious Bursal Disease (IBD). CVL also started multiplex PCR for respiratory disease of small ruminant (PPR, CCPP, Capripox, Pasteurella) and swine diseases (African swine fever virus, Classical swine fever virus, Salmonella and Erysipelas) and other diseases like Porcine Reproductive and Respiratory Syndrome (PRRS-NA and PRRS-EU), since 2016. Later on the technologies expand for diagnosis of other zoonotic and economically importance diseases like Glanders, Lumpy skin Diseases (LSD) and Enterotoxaemia. Molecular unit also participate in proficiency testing (PT) for AI, PPR and Swine diseases (ASF, PRRS etc.) since 2016.

In the Fiscal year 2077/78, a total of 510 tissue and swab samples of avian species suspected for avian influenza were received from thirty-five districts. Those samples were tested by using Real Time Reverse Transcriptase Polymerase Chain Reaction (rRT PCR). Out of those samples, 57.84% samples were found to be positive for subtype H9N2 and 17 samples were positive for HPAI (H5N8). HPAI (H5N8) outbreak occurred in Kathmandu, Lalitpur, Surkhet and Jajarkot districts. Samples were also sent to OIE Reference laboratory, Australia for genetic characterization. The virus associated with the current outbreak was of 2.3.4.4b clade.

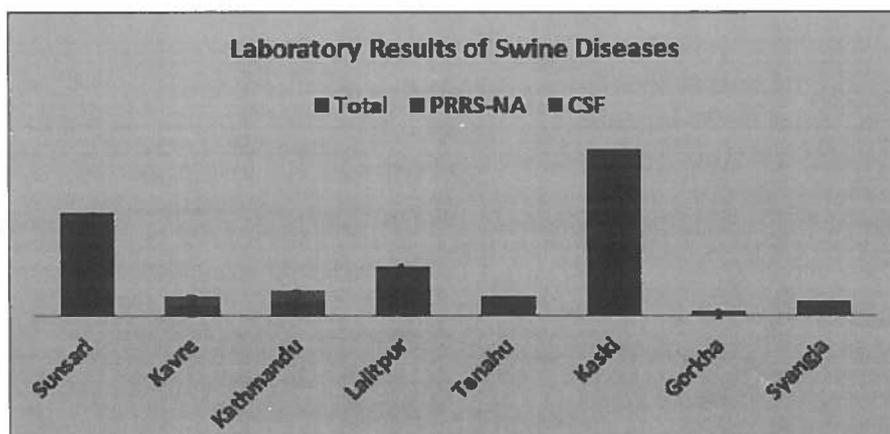


CVL also received bio-surveillance sample (TS/CS/ES/NS) for avian influenza from fourteen districts. A total of 1342 samples were tested by using rRT-PCR of which 7 samples from Bardiya were positive for Subtype H9.

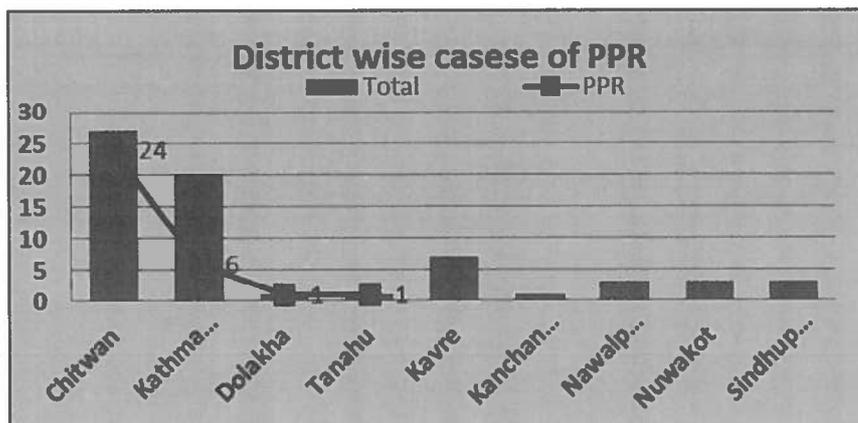


Likewise CVL received a total of 137 samples of avian species suspected for Newcastle Disease (ND) from 20 districts. Out of those samples, 70.80% samples were found to be positive for ND virus. According to OIE Report, F-gene sequences of the Nepal isolates (virus) belonging to genotype VII.

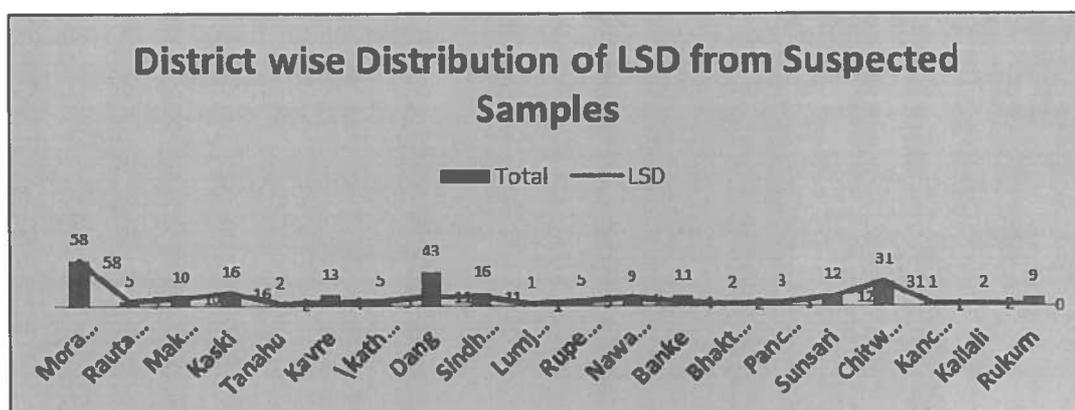
Likewise CVL received 62 tissue samples from eight districts for swine diseases. Out of those samples, 4 samples from Kathmandu and Kaski were found to be positive for CSF and 16 samples were positive for PRRS-NA.



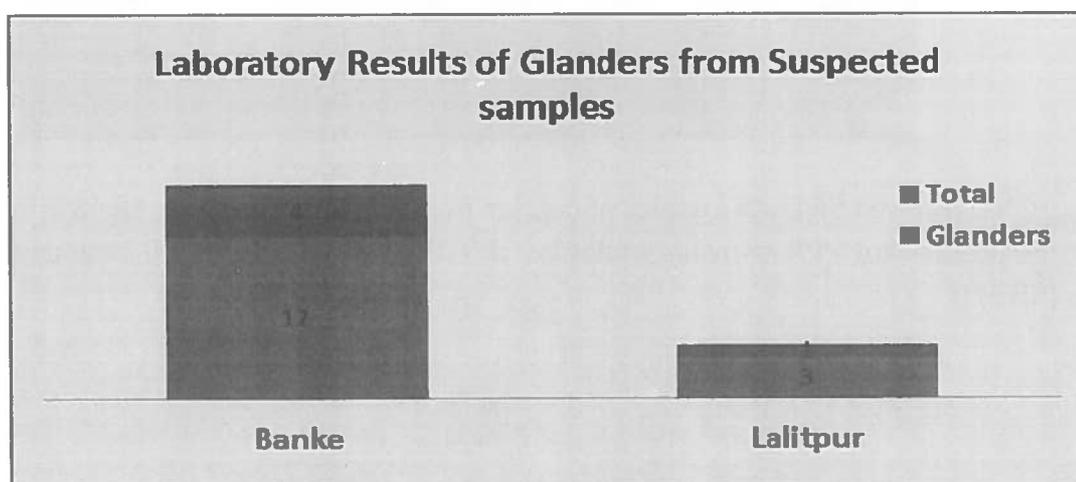
Likewise, CVL received 66 swab samples of caprine from nine districts. Only 48.48% samples were found to be positive for PPR by using multiplex rRT-PCR method for small ruminant respiratory diseases (SRRD).



CVL also received bovine samples (Swab/pus/scar) from twenty districts for Lumpy Skin Disease (LSD). A total of 254 samples were tested by using rRT-PCR method. Only 75.2% samples were positive for LSD. LSD virus in this outbreak was closely related to LSDV KSGP-0240, LSDV NI2490, LSDV Kenya and LSDVs found in Bangladesh.



CVL also received 15 equine pus swab samples from Banke and Lalitpur districts. A total of 5 samples (4 from Banke and 1 from lalitpur) were positive for glanders by PCR. The bacterial strain was similar to the strain circulating in Pakistan and India.

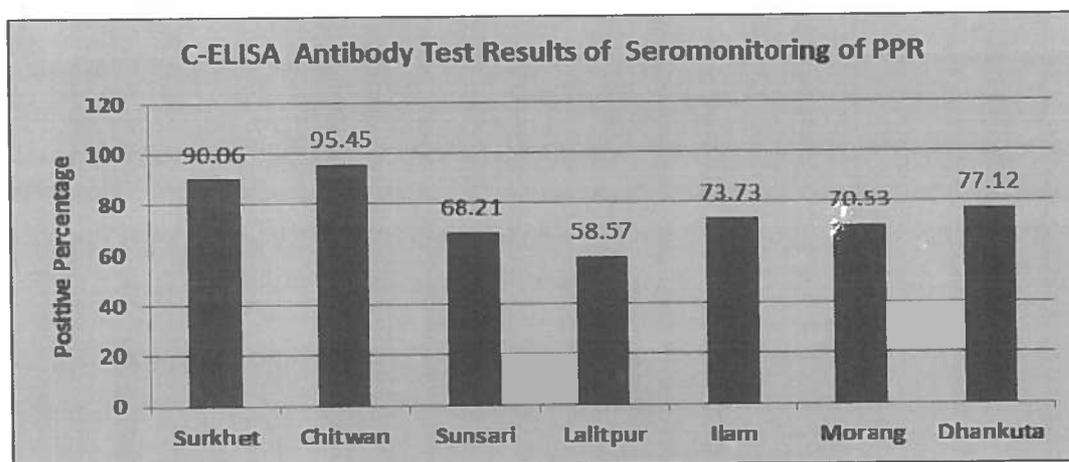


5.3.2 Serology Unit

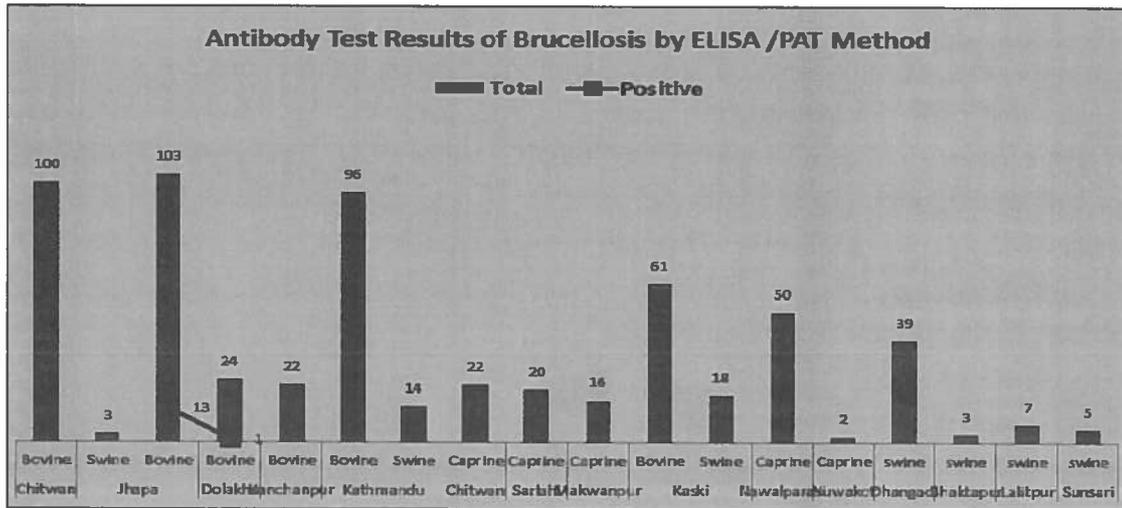
Serology unit of CVL performs different serological tests for the diagnosis, monitoring and surveillance of animal diseases mainly associated with viral and bacterial infection. Most of the samples are submitted to this unit by VLs, NADIL, VHLSEC, local levels, Quarantine Check-posts, private practitioner, farmers and staff of CVL during disease outbreak investigations, routine diagnosis as well as sero-monitoring. This unit possess capacity and facility of Competitive Enzyme Linked Immunosorbent Assay (ELISA), Immuno-capture ELISA, Indirect ELISA, Tube agglutination Test and Plate agglutination test.

Serology unit also participates in proficiency testing (PT) especially for PPR diagnosis by ELISA method and Brucellosis by PAT since 2016. Progress report of serological investigation of various diseases in animals and birds during 2077/078 is as follows.

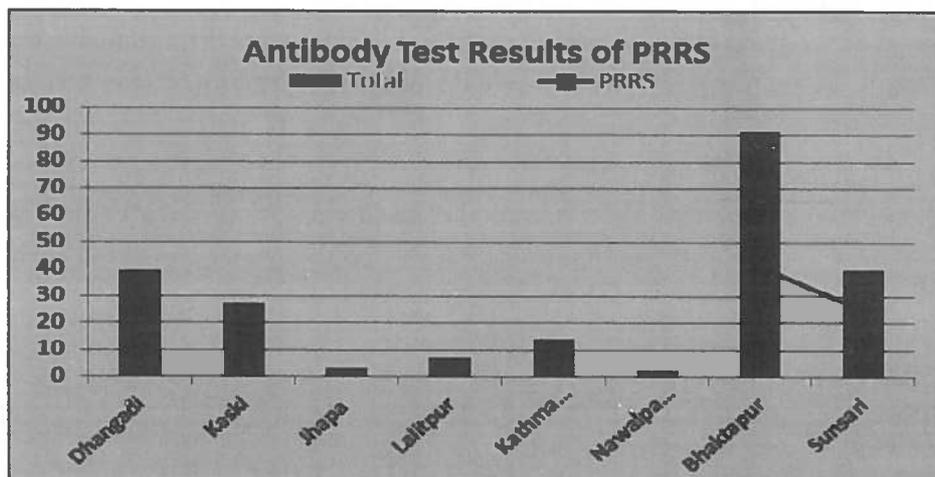
In case of sero-monitoring, sample collection was done at the end of fisacl year 2077/778 but tested in 2077/78. CVL received serum samples from 7 districts only. Due to covid-19 pandemic, we couldnot collect the required numbers of samples. During 2077-78, a total of 770 serum samples of vaccinated goats were tested. Out of those samples, 83.25% were found to be positive for PPR antibody. The result showed that the PPR antibody positive percentage was found highest (more than 90%) in two districts (Chitwan and Surkhet). The antibody positive percentage found in the serum samples of Lalitpur was not satisfactory (below 60%). The antibody positive percentage between 60-90 was found in remaining 4 districts. The low antibody positive percentage might be due to either sampling error or cold chain problem or the samples were collected earlier.



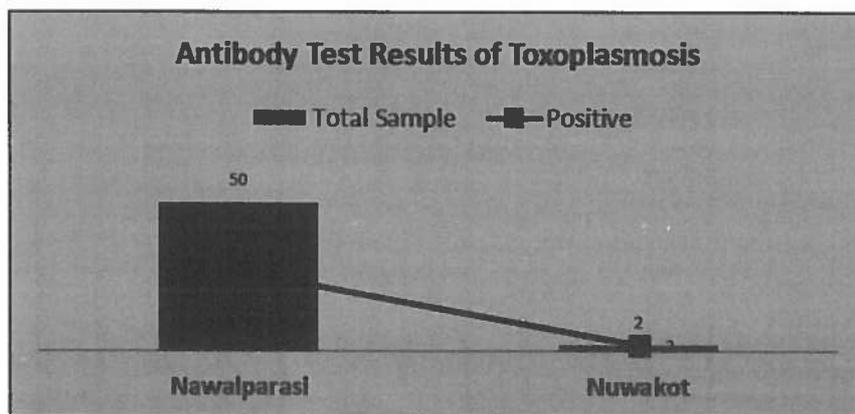
A total of 605 serum samples from bovine, caprine and swine were tested for Brucellosis antibody by ELISA and PAT method and 13 sample from Jhapa and 1 sample from Dolakha were found to be positive for brucellosis.



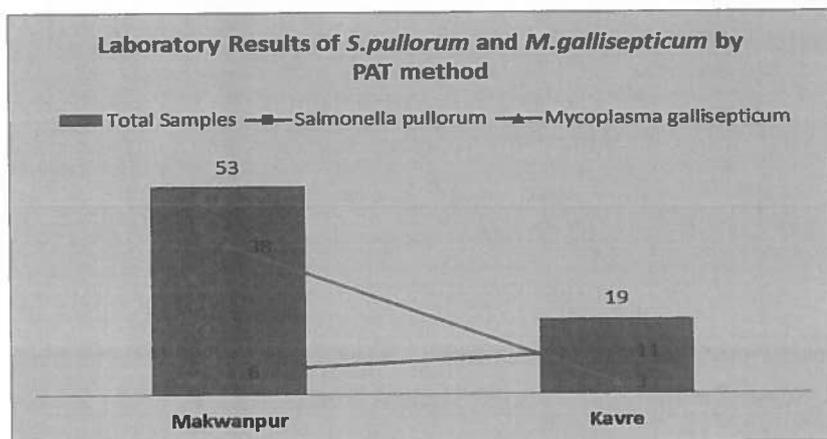
A total of 223 swine serum samples from eight districts were tested for antibody of PRRS by ELISA method, 29.6 % samples from Bhaktapur and Sunsari were positive for PRRS.



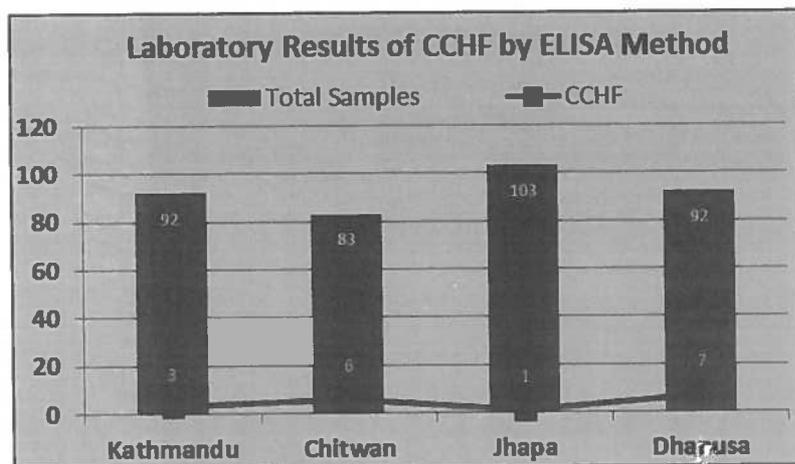
A total of 52 caprine serum samples from Nawalparasi and Nuwakot were tested for Toxoplasma antibody by ELISA method, 55.77 % samples were positive for Toxoplasmosis.



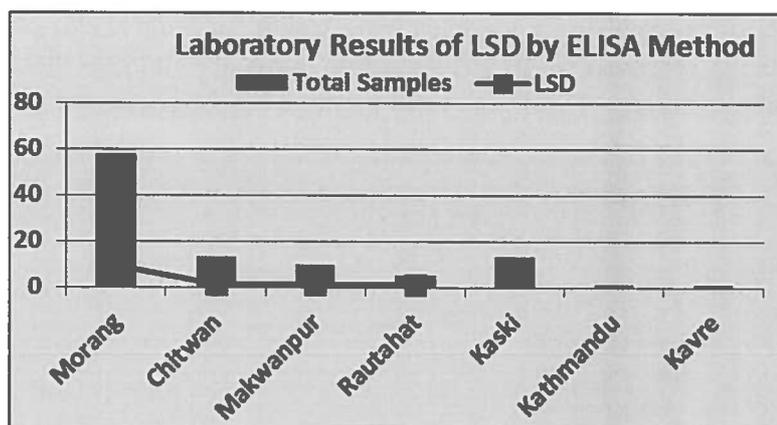
A total 72 number of poultry serum samples were tested for *Salmonella pullorum* and *Mycoplasma gallisepticum* antibody respectively by PAT method. Only 17 samples were found to be positive for *Salmonella pullorum* whereas 41 samples were positive for *Mycoplasma gallisepticum* antibody.



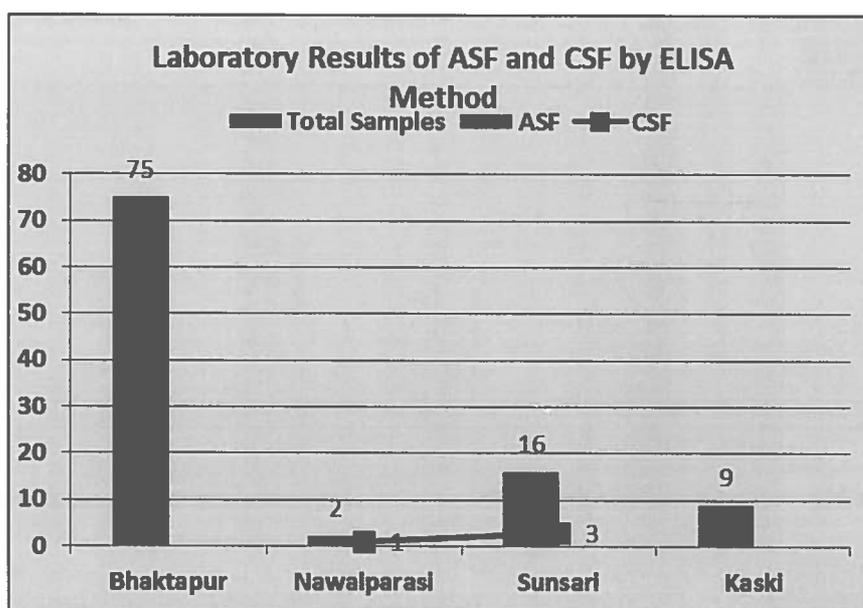
A total of 432 bovine serum samples from Kathmandu, Chitwan, Jhapa and Dhanusa were tested Crimean-Congo Haemorrhagic Fever (CCHF) antibodies by ELISA method, 3.94 % samples were positive for CCHF.



A total of 101 bovine serum samples from Kathmandu, Chitwan, Jhapa and Dhanusa were tested for antibody of Lumpy Skin Disease (LSD) by ELISA method, 11.88 % samples were positive for LSD.



A total of 102 porcine serum samples from Bhaktapur, Nawalparasi, Sunsari and Kaski were tested for antibody of African Swine Fever (ASF) and Classical Swine Fever (CSF) by ELISA method. Only 4 samples from Sunsari and Nawalparasi were found to be positive for CSF and none of the serum samples were positive for ASF.



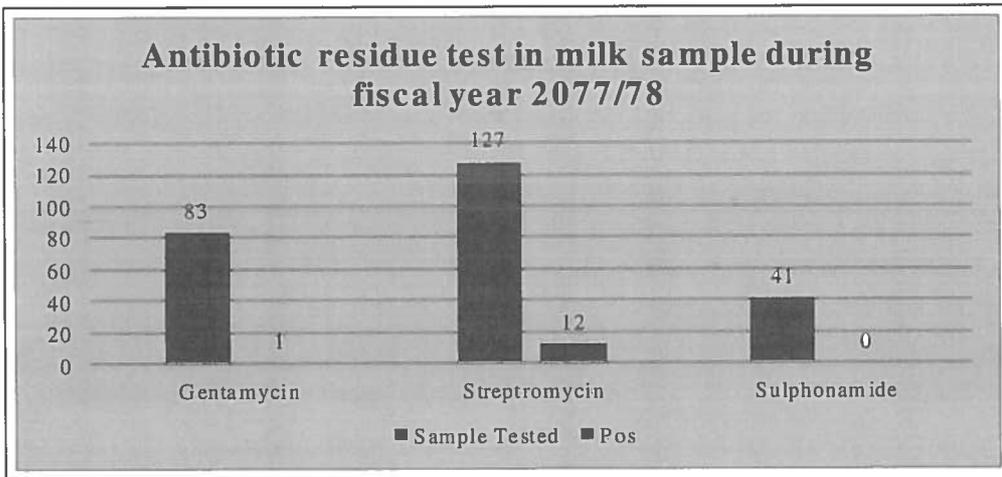
5.4 Veterinary Public Health Section

Veterinary Public Health section is responsible to assure the safety of public with consumption of animal products. This section conducts various programs to address public health issues such as veterinary drugs, insecticides/hormones/pesticides residue testing in milk, egg, meat and fish. This section is conducting antibiotic residue testing in certain group of antibiotics like as Streptomycin, Gentamycin, Sulphonamides, Fluoroquinolones, Ampicillin and Tetracycline. It conducts hormone test in the milk and meat that are harmful to the health of people. It is conducting the ractopamine residue and progesterone hormone residue test in milk and meat sample as well as oxytocin test in milk samples. It is involved in surveillance of zoonotic diseases like brucellosis, toxoplasmosis,

leptospirosis and Q-fever. It is responsible to conduct zoonotic disease surveillance that are prevalent and at high risk in Nepal and monitoring of meat shop.

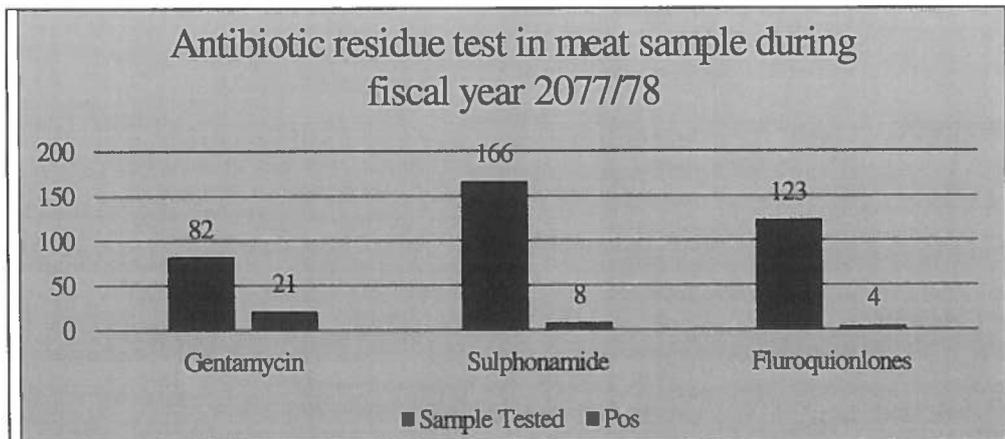
5.4.1 Antibiotic residue test in milk

During fiscal year 2077/78, a total of 251 milk samples were tested for antibiotic residue. Total 83 milk sample were tested for gentamycin residue where one sample was found to cross Maximum Residual Limit (MRL) value of Gentamycin. Total 127 milk samples were tested for Streptomycin residue where 12 were found to be above MRL. Total 41 milk samples were tested for Sulphonamide all samples were within permissible limit.



5.4.2 Antibiotic residue test in Meat

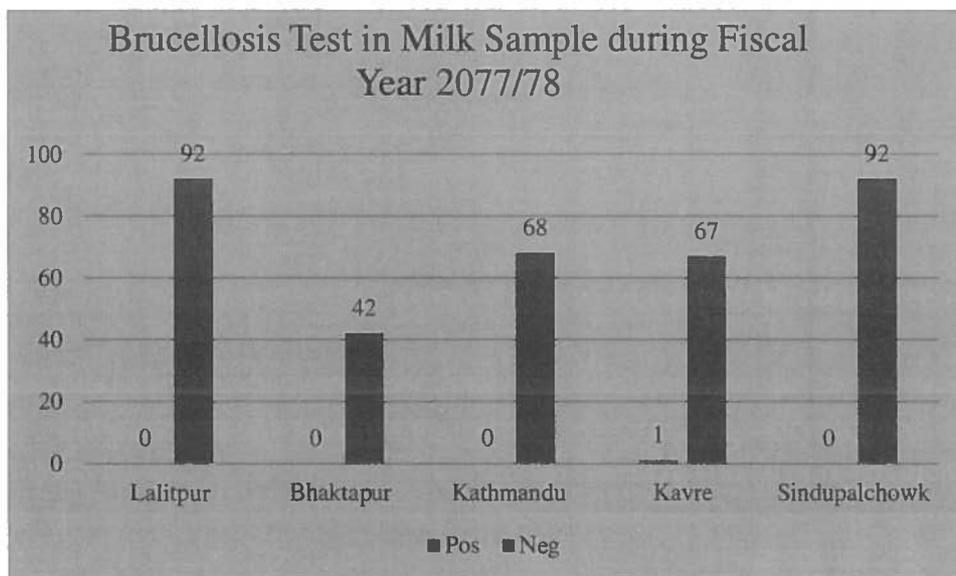
During fiscal year 2077/78, a total of 371 meat samples were tested for the antibiotic residue. Total 82 meat sample were tested for Gentamycin residue where 21 sample were found above MRL. Total 166 meat samples were tested for Sulphonamide residue in meat sample where 8 were found above MRL. Total 123 meat samples are tested for Fluroquinolones and 4 samples were found above MRL.



5.4.3 Zoonotic diseases surveillance

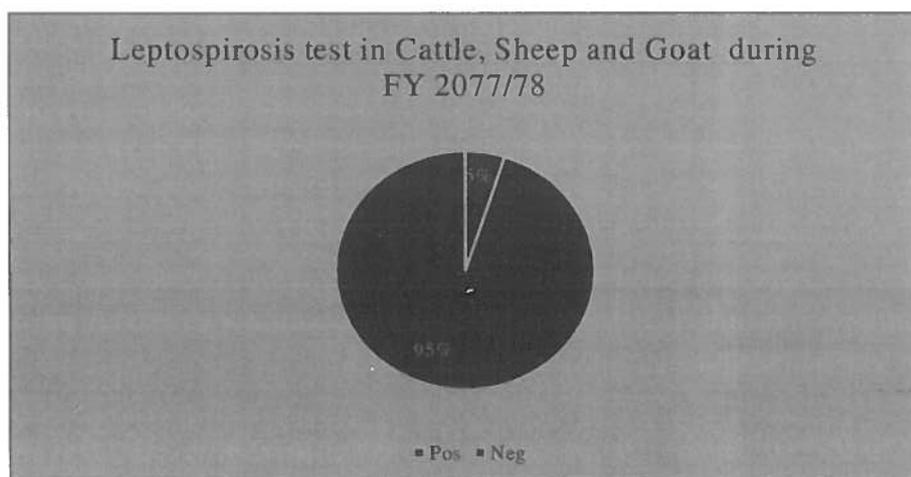
Brucellosis

A total of 362 milk samples were tested for Brucella antibody from Kathmandu, Bhaktapur, Lalitpur, and Sindupalchowk districts and one sample was tested positive.



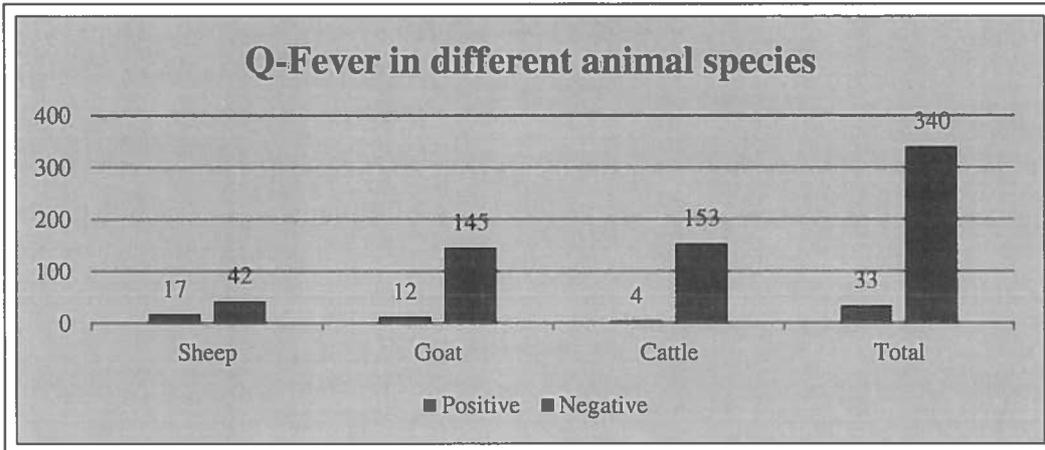
Leptospirosis

A total 176 serum sample collected from cattle, sheep and goat were tested for *Leptospira hardjo* antibodies and 5% were positive.



Q-Fever

A total of 373 serum samples (sheep-59, goat-157 and cattle-157) were tested for Q-Fever where 17(28.81%) samples from sheep, 12(7.67%) samples from goat and 4(2.55%) from cattle were found to be positive for Q-fever.



Formalin Test in Fish

A total of 141 samples were tested for formalin residue and 10 (7%) were found positive for formalin contamination.

VETERINARY LABORATORY

BIRATNAGAR

1. Introduction

Veterinary Laboratory (VL) has been situated in metropolitan city, Biratnagar-13, Province No.1. The working area of this laboratory is all the districts of Province 1. Altogether, there are 14 districts in this province of which Taplejung, Sankhuwasabha and Solukhumbu of high hills to mountain region; Panchthar, Illam, Dhankuta, Terahthum, Bhojpur, Okhaladhunga, Khotang, and Udaypur districts of mid to low hills region; and Jhapa, Morang, Sunsari from terai region. The laboratory is providing diagnostic services to the animals and their samples originating from this province and infrequently to Saptari and Siraha districts of Madesh Pradesh. The laboratory has been working as a referral laboratory in this province for diagnosis of diseases in livestock and poultry.

2. Objectives

- ❖ To provide prompt and efficient disease diagnostic services to the farmers of the region.
- ❖ To investigate and diagnose the epidemics in the region.
- ❖ To assist and support VHLSECs in disease diagnosis and epidemic control.
- ❖ To supervise and assist in diagnostic services to basic and primary laboratories situated in VHLSECs of the region.
- ❖ To collect, analyze and predict the animal diseases prevailing in the region.
- ❖ To develop human resources for the field level veterinary services.
- ❖ To co-ordinate and support national animal disease control and eradication program.
- ❖ To support and facilitate the national veterinary regulatory services.
- ❖ To participate actively in collaborative and coordinated research program in animal health and production in the region.
- ❖ To support animal health and infertility camps in the region.

3. Organizational structure

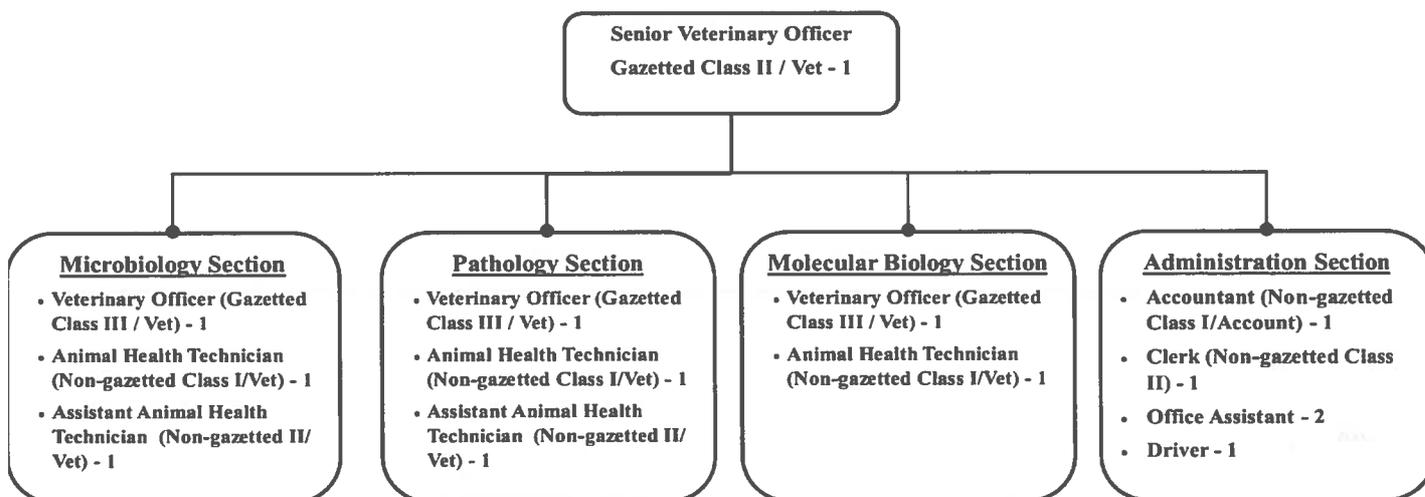


Figure: Organogram of the VL, Biratnagar as approved by Government of Nepal

The list of staffs that worked at the laboratory in FY 2077-78 is given in table below.

S.N	Name of Staff	Designation	Class
1	Dr. Sanjay Kumar Yadav	Senior Veterinary Officer	Gazetted II
2	Dr. Ananta Koirala	Veterinary Officer	Gazetted III
3	Dr. Suraj Subedi	Veterinary Officer	Gazetted III
4	Dr. Khila Bogati	Veterinary Officer	Gazetted III
5	Mr. Balaram Pokharel	Accountant	Non- gazetted I
6	Mr. Yogendra lal Yadav	Veterinary Technician	Non- gazetted I
7	Ms. Babita Rai	Veterinary Technician	Non- gazetted I
8	Mr. Bikash Adhikari	Asst. Veterinary Technician	Non- gazetted II
9	Mr. Bishnu Prasad Dulal	Asst. Veterinary Technician	Non- gazetted II
10	Mr. Ramesh Kumar Khadka	Kharidar	Non- gazetted II
11	Mr. Ram Sewak Mandal	Office Assistant	Classless
12	Mr. Gajanand Thakur	Office Assistant	Classless
13	Mr. Ram Narayan Yadav	Light Vehicle Driver	Classless

4. Laboratory services

The laboratory is providing various diagnostic services in the province 1. The routine laboratory works of VL, Biratnagar, involves hematological and biochemistry evaluation, postmortem examination, bacterial culture and sensitivity in milk and postmortem samples, Rapid testing of

different poultry diseases, Rapid tests for other animals diseases, Serological examination using agglutination tests and ELISA, and fecal and urine testing.

4.1 Parasitological examination

In this examination, both internal and external parasites are identified from the samples. For internal parasites, fecal examination of goat is done routinely. The fecal samples are received mainly from commercial goat farms, VHLSECs and also collected from field during investigation programs. Most frequently the fecal examination was done by sedimentation and floatation techniques to identify the gastro-intestinal parasites. However, in certain cases, McMaster technique was followed to quantify the eggs per gram (EPG) in feces.

In the fiscal year 2077/078, altogether 151 fecal samples from Sunsari, Morang, Dhankuta and Udaypur districts were examined. A total of 23 samples (15.23%) were positive. The details of different parasites observed in fecal examination in given in graph below.

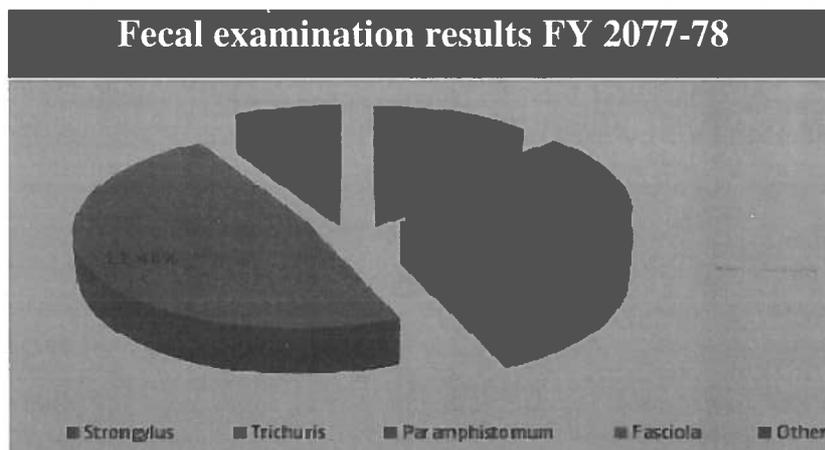


Figure: Parasites observed during fecal test

4.2 Haematological examination:

Blood samples received from different districts were examined for regular hematology and blood parasites. A total number of 595 samples were examined comprising of 517 from cattle, 27 from buffalo, 26 from dog and 25 from goat. A total of 163 (27.39%) samples were positive for blood parasites. Different blood parasites that are observed in shown in figure below.

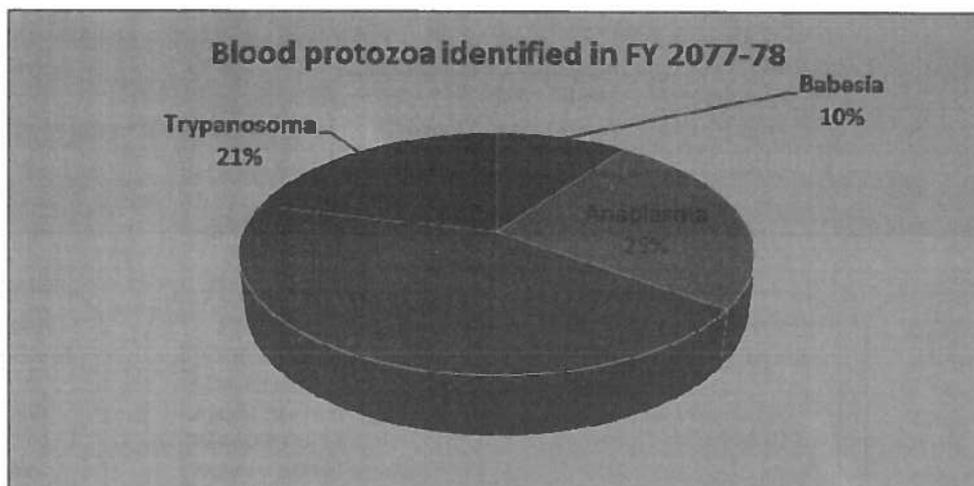


Figure: Different blood parasites observed in FY 2077-78

Generally heavy infestations of blood protozoan parasites are seen from Chaitra to Ashwin every year, probably due to increase in vector population during the rainy season. The monthly pattern of sample flow and blood parasite positive results identified is given in figure below.

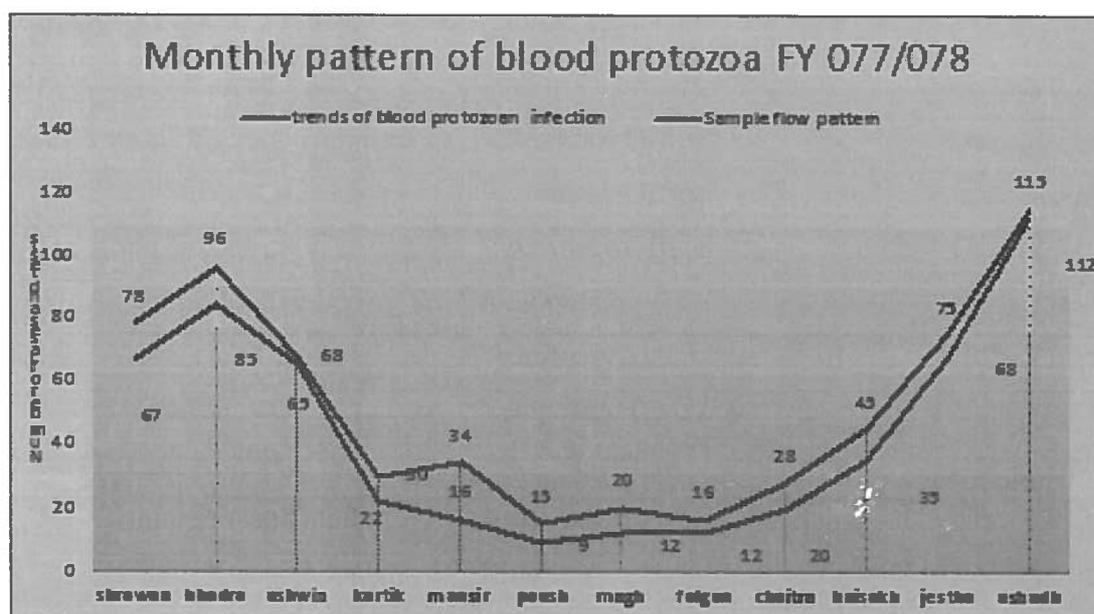
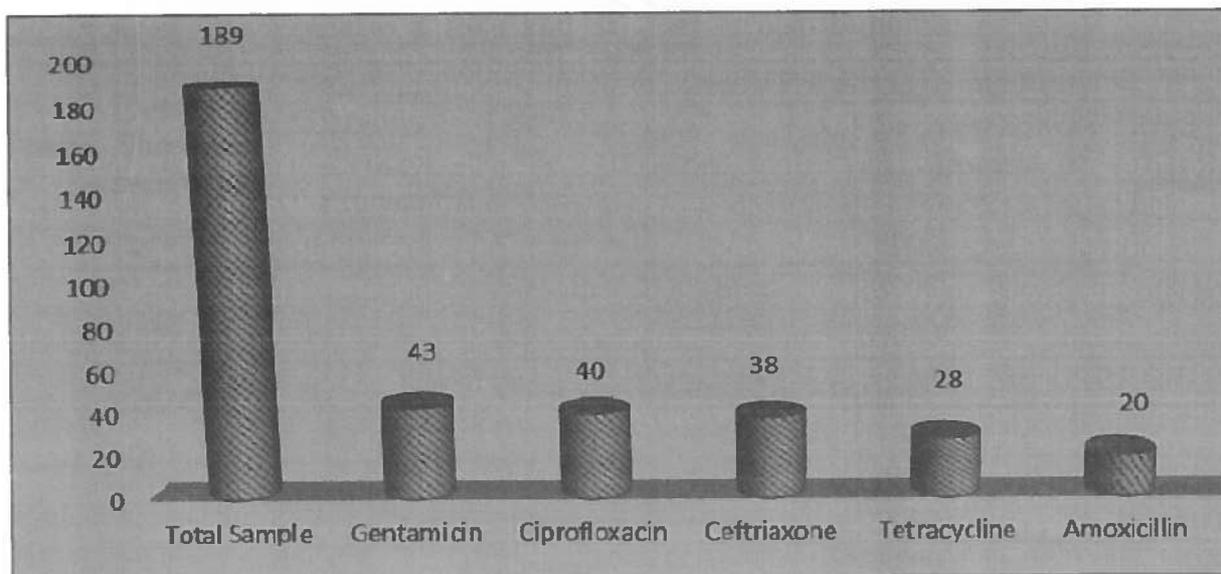


Figure: Monthly pattern of blood sample received for blood protozoal examination and their positive results in FY 2077-78

4.3 Microbiological examination:

Altogether 372 milk samples were tested from Morang, Sunsari, Jhapa and Saptari. A total of 189 (50.81%) samples were positive in CMT and culture. The most prevalent bacteria isolated from these positive milk samples were *E. coli*, *Staphylococcus*, *Streptococcus*, *Klebsiella*, *Salmonella*, *Pseudomonas*, *Enterobacter* etc. The result of culture and antibiotic sensitivity are shown in graphics below, where the number represents the sensitive.



4.4 Pathological examination

Laboratory is providing diagnostic services for canine disease using rapid kits for common canine diseases. The details of the tests for 5 different canine disease for F/Y 077/078 is given in figure below.

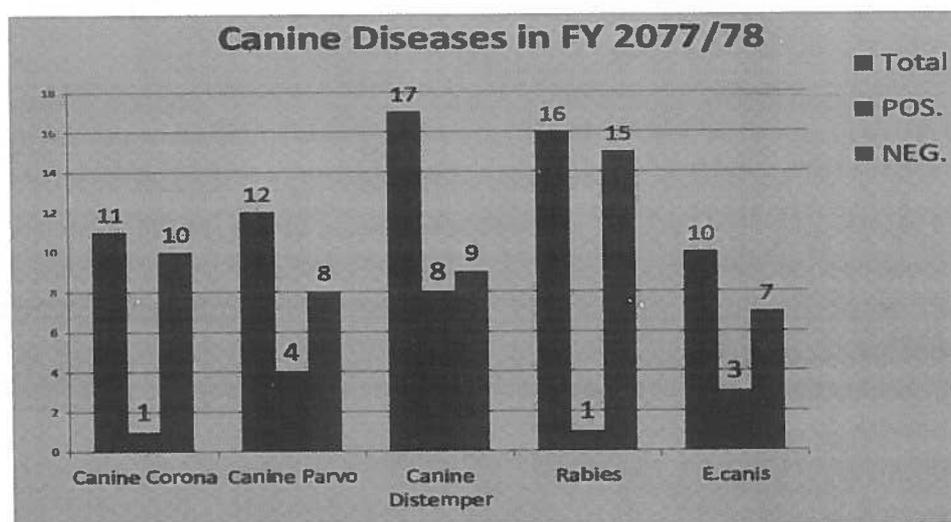


Figure: Major canine diseases observed in FY 077/078

In the fiscal year 077-078 a total of 941 dead poultry has been necropsied and tested by using different Rapid test kits for disease diagnosis. Samples were received from Morang, Sunsari, Jhapa, Saptari, Udaypur, Dhankuta and Illam districts. The sample were higher in the Magh, Falgun and Chaitra compared to other months as shown in figure below.

Graphical Representation of Month Wise Sample Flow

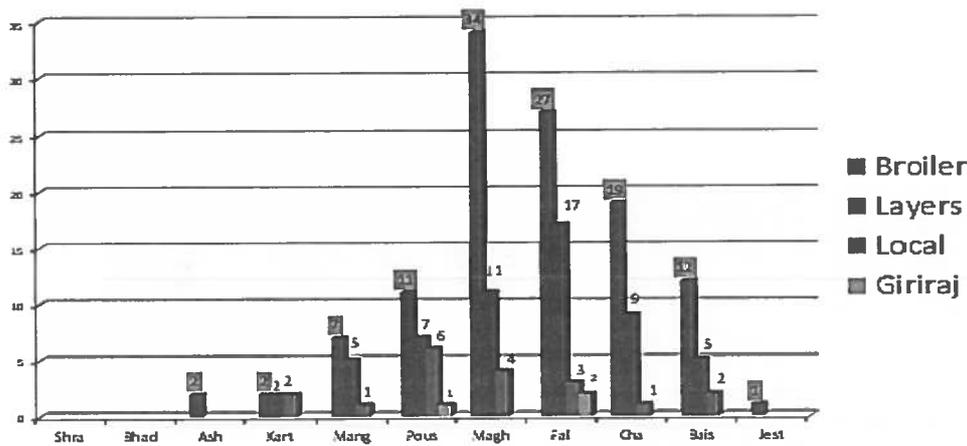


Figure: Monthly sample flow in VL Biratnagar

Out of 941 dead birds mostly the Colibacillosis, ND & CRD, are the common diseases prevalent in this province which were reflecting by 22%, 21% & 16% respectively. HPAI outbreak in Kanepokhari of Morang district was also detected earlier by this Lab and controlled timely by joint actions of 3 tier Governments officials in this fiscal year 077/078.

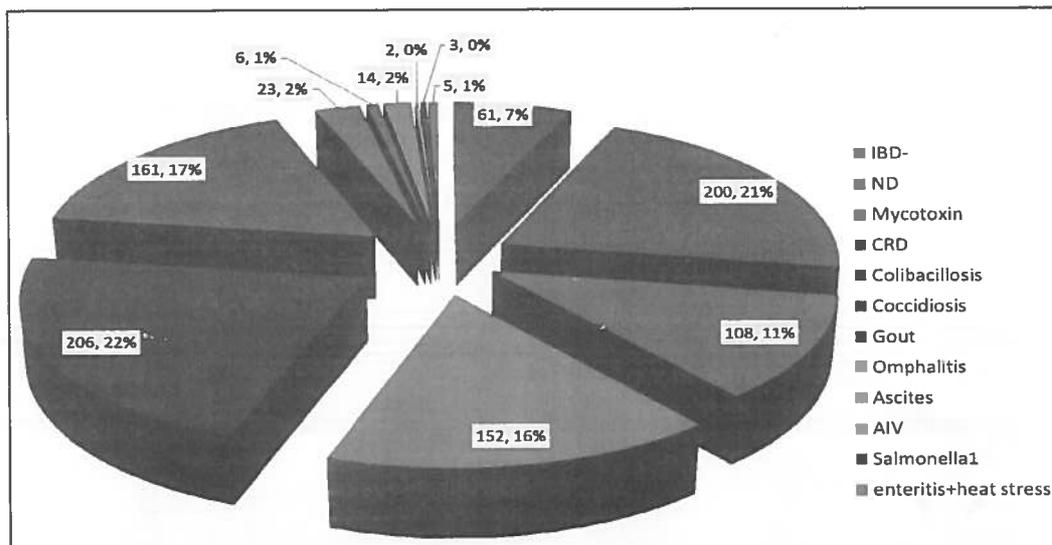
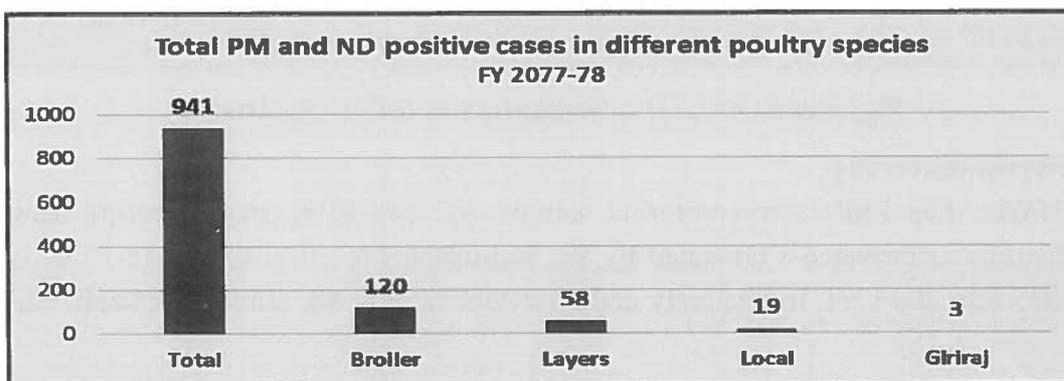


Figure: Post-mortem examination and tentative diagnosis of poultry diseases

In this fiscal year there were heavy outbreak of ND in local, broiler and layers as shown below.



Lumpy Skin Disease

LSD was first seen in this province. The clinical disease was notified to the laboratory on Ashad 2077 from Morang district which later spread throughout the province. LSD investigation was done clinically, and samples were sent for confirmation to CVL. The typical lesions observed in LSD cases is presented in Figure below.

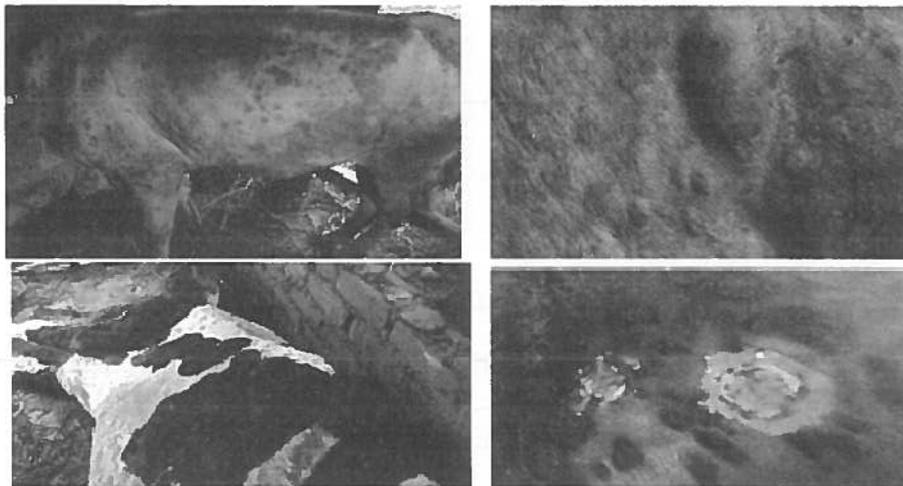


Fig: LSD clinical presentation in cattle as observed during LSD outbreak in the province

LSD investigation was done using antibody ELISA. A total of 388 serum samples were tested for LSDV antibodies and 195 (50.25%) samples were positive as shown in figure below.

ELISA results of LSD Outbreak

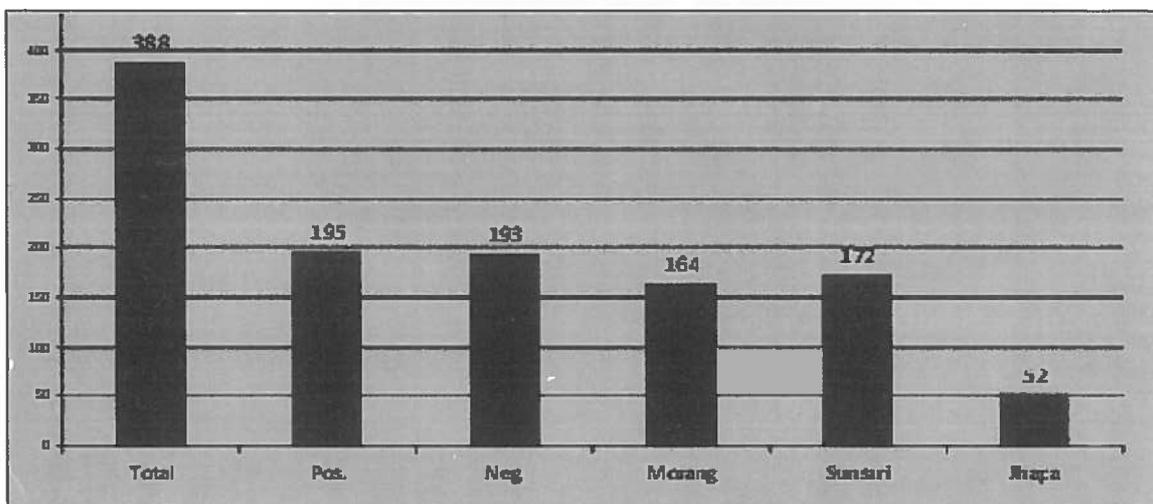
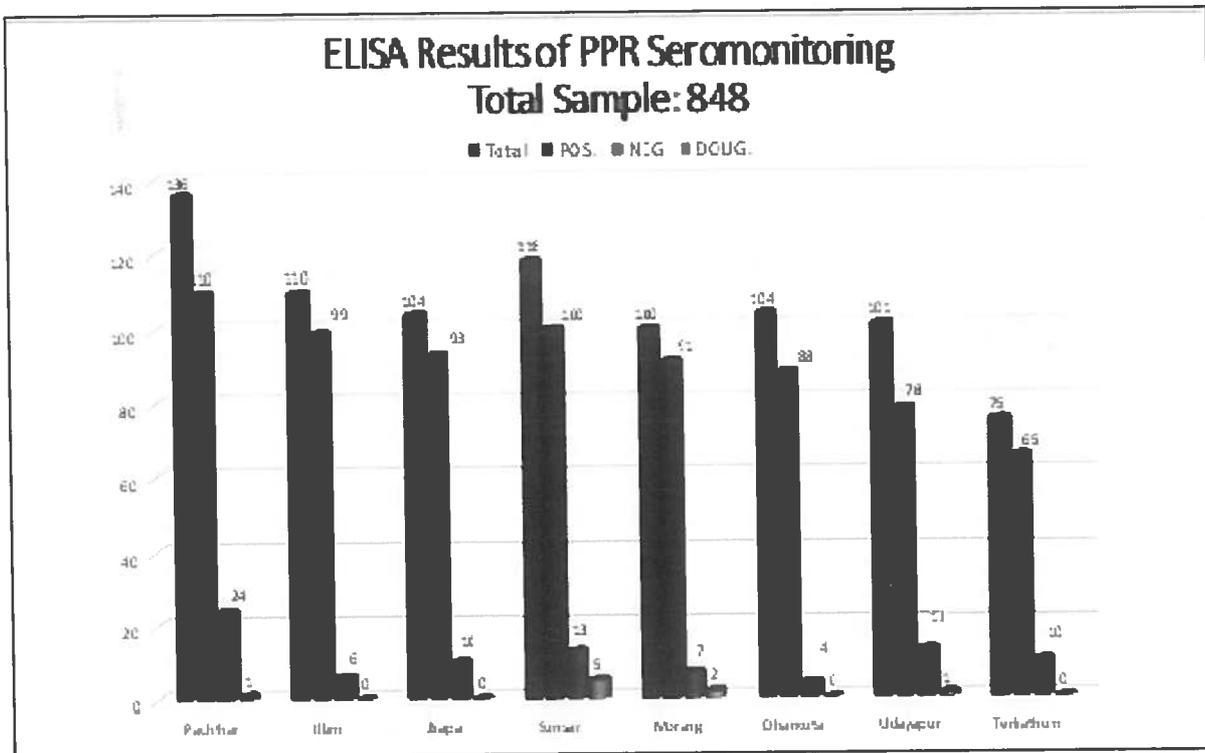
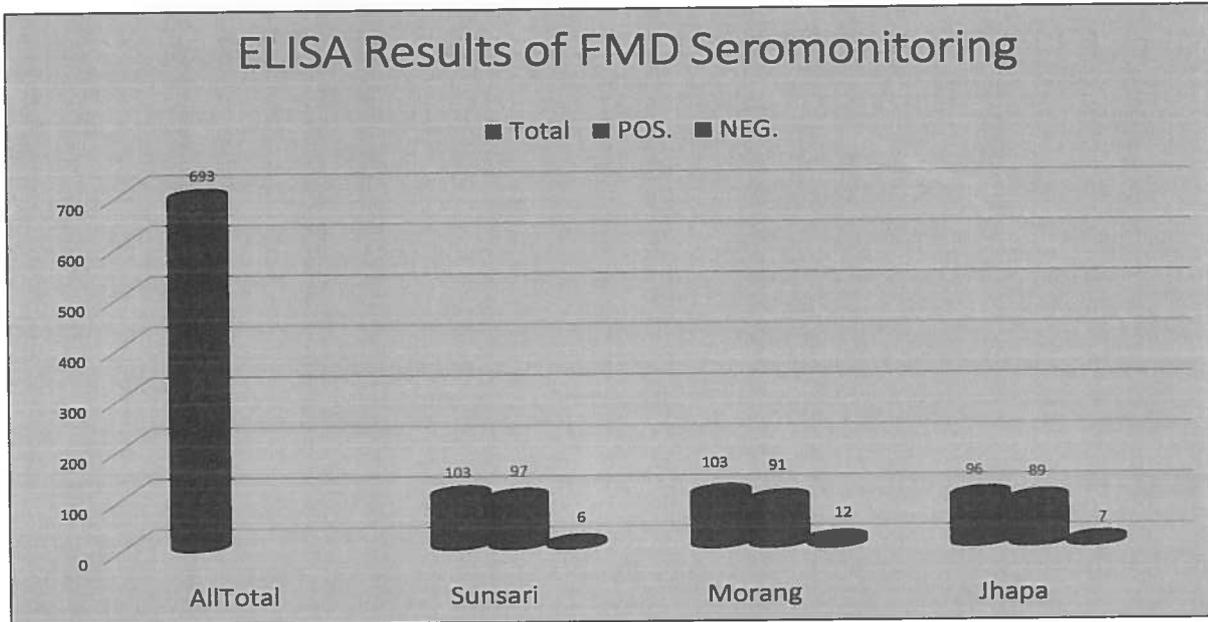


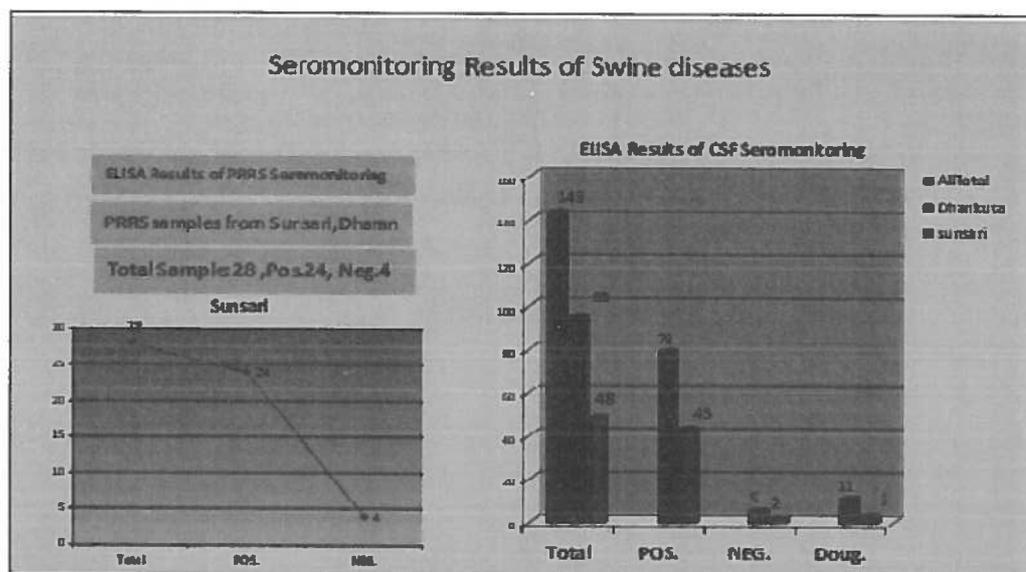
Fig: Result of LSD investigation in different districts

Vaccine Seromonitoring

In F/Y 077/078, 693 FMD seromonitoring sample and 848 PPR seromonitoring samples from different districts of Province-1 collected by VL Biratnagar even in peak Covid-19 outbreak were sent to TADS Lab and CVL respectively and also done here in VL Biratnagar itself. The result of

seromonitoring program of FMD, PPR, CSF and PRRS conducted by VL Biratnagar on F/Y 077/078 are shown in following graph.





Miscellaneous disease outbreaks

Sometimes, sporadic outbreak of Anthrax is seen in wild and domesticated animals of province 1. Blood from the suspected animals is collected carefully and observed on microscope for the bacillus organism to confirm the anthrax outbreak. Other important disease of this province is Bovine Tuberculosis (BTB), Samples collected from the various farm and animals of this province has shown antibody positive for BTB. A Rapid test is conducted in veterinary laboratory; Biratnagar to identify BTB in animals has shown many positive cases of bovine tuberculosis. As both these diseases are of zoonotic importance the central government and provincial government should build up plans and program to prevent these diseases in coordination with laboratory.

5. Regional Vaccine Bank

After the end of F/Y 077/078 status of different vaccines given by DLS to the VL Biratnagar for National Disease Control Program are as follows-

Table: FMD vaccine distribution in different districts

Vaccine	Date of vaccine received	Date of vaccine dispatched	District of dispatch & dose		
			National Disease Control Program	District	National Disease Control programme
FMD	2077/06/30	160000	Sunsari-	130000	21500
	2077/07/17	200000	Pachathar, Taplejung -	15000	4000
	2077/09/09	72000	Sankhuwasava, Bhojpur -	8000	
	2077/12/17	181500	Okhaldhunga, Solukhumbu-	10000	
	2077/12/25	92400	Dhankuta, Terhathum-	10000	
			Jhapa, Ilam-	158500	7500
			Udhaypur Khotang-	50300	20000
			Morang-	123500	10550
			Saptari		3500
	Total	705900		505300	67050

Detail of PPR Vaccine Distribution

Vaccine	Date of Vaccine received	Date of vaccine dispatched	District of dispatch & dose		
		National Disease Control Program	District	National Disease Control Programme	Outbreak control
PPR	2077/09/09	1297000	Sunsari	150000	7000
			Pachathar, Taplejung	50000	3000
			Sankhuwasava, Bhojpur	121000	2400
			Okhaldhunga, Solukhumbu	70000	
			Dhankuta, Terhathum	120000	5000
			Jhapa, Ilam	310000	9000
			Udhaypur Khotang	282000	8000
			Morang	200000	5100
			Saptari		10000
	Total	1297000		1233000	49500

Detail of HS/BQ and CSF Vaccine Distribution

Vaccine	Date of Vaccine received	Date of vaccine dispatched	District of dispatch & dose		
		National Disease Control Program	District	National Disease Control Programme	Out break control
HS/BQ	2077/12/25	60000	Sunsari-	15000	300
			Sankhuwasava, Bhojpur -	3000	
			Udhaypur Khotang-	10000	1000
			Morang-	20000	700
			Saptari		500
	Total			48000	2500
CSF	2077/09/09	164000	Sunsari-	33000	
	2077/10/28	78000	Pachathar, Taplejung -	11000	
			Sankhuwasava, Bhojpur -	27200	
			Okhaldhunga, Solukhumbu-	10000	
			Dhankuta, Terhathum-	4300	
			Jhapa, Ilam-	42000	
			Udhaypur Khotang-	23000	
			Morang-	33500	
	Total	242000		184000	

Status of ARV and ND Vaccine distribution

Vaccine	Date of Vaccine received	National Disease Control Program	District of dispatch and dose		
			District	National Disease Control Programme	Out break control
ND	2077/09/09	275000	Sunsari-	20000	
			Pachathar, Taplejung -	12000	
			Sankhuwasava, Bhojpur -	69000	
			Okhaldhunga, Solukhumbu-	20000	
			Dhankuta, Terhathum-	11000	
			Jhapa, Ilam-	8000	10000
			Udhaypur Khotang-	28000	15000
			Morang-	33500	5000
	Total			201500	30000
Rabies	2077/06/11	5000	Morang-	1500	1970 World Rabies Day
			Udhaypur-	280	
			Sunsari-	850	
			Saptari-	400	
	Total			3030	1970

VETERINARY LABORATORY JANAKPUR

1. Introduction

Veterinary Laboratory, Janakpur is situated in Janakpurdham city of Madhesh province. The laboratory is providing diagnostic services 6 districts of Madhesh Pradesh and occasionally to adjoining districts of Bagamati Pradesh. The working areas of this Laboratory mainly focused on surrounding district like Dhanusha, Mahottari, Sarlahi, Rauthat, Bara, Parsa, Siraha, Saptari, and Sinduli. The laboratory has various units viz Pathology, Parasitology, Microbiology, Hematology, Biochemistry, Sterilization and Serological. Histopathological and Molecular Laboratory test results are obtained by dispatching the relevant specimens to CVL, as these diagnostic facilities are not available in Veterinary Laboratory, Janakpur at present.

2. Objectives

- To provide disease diagnosis facilities to the farmers.
- To investigate & diagnose the epidemics in the region.
- To assist & support in disease diagnosis and epidemic Control in the region.
- To support animal health and infertility camps in the region.
- Disease monitoring, sample collection & diagnosis.
- Sero-monitoring on vaccinated animal & poultry
- Zoonotic disease investigation & control
- Epidemiological report recording & risk analysis
- Vaccine bank storage & distribution

3. Organizational Structure

The organization structure of the laboratory is presented in table below.

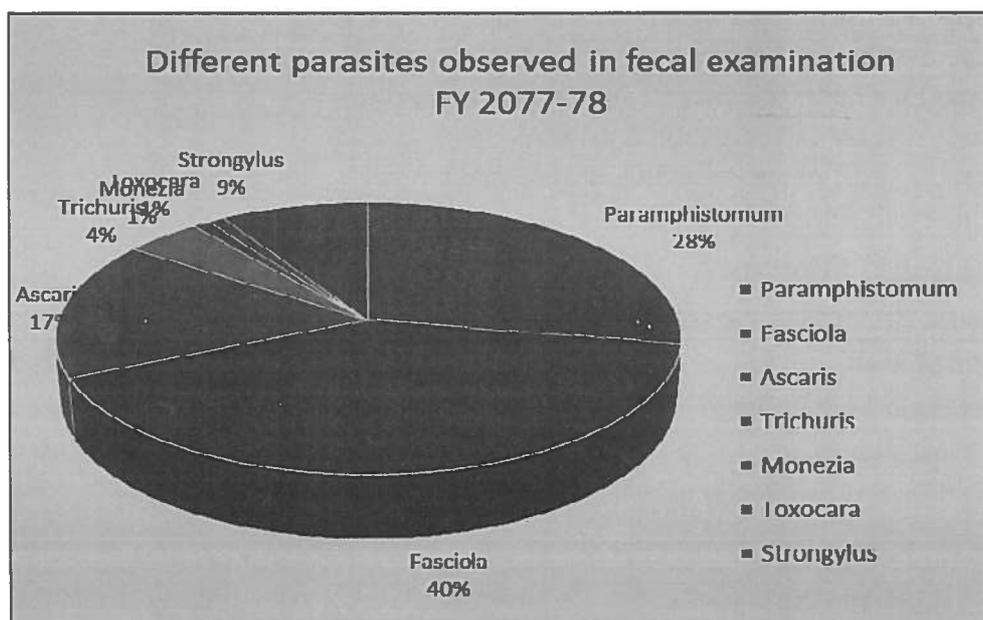
S.N.	Name of staff	Post	Responsibility
1.	Dr. Rakesh Mohan Singh	S.V.O.	Chief
2.	Dr. Mukesh Nayak	V.O.	1. Laboratory quality management & Planning 2. Microbiology, Postmortem, Serology & Pathology
3.	Mr. Rakesh Kumar Sah	V.O.	Parasitology & Hematology
4.	Mr. Anirudh Sah	J.T.	Microbiology, Postmortem Serology & Pathology
5.	Mr. Laxmi Mandal	J.T.	1. Administration, Store 2. Parasitology & Hematology
6.	Mr. Satyanarayan Sah	J.T.	Parasitology & Hematology
7.	Mr. Sudhir Kumar Sah	Accountant	Financial
8.	Mr. Kula Nand Jha	Driver	Driving
9.	Mr. Surendra Mishra	Office assistant	Office Attendant
10.	Mr. Binod Kapad	Office assistant	Office Attendant

4. Laboratory services

The routine laboratory works of veterinary laboratory Janakpur, mainly involves examination of fecal Sample, Postmortem Examination, Sero-Surveillance, CMT test of milk samples and culture examination. Blood samples are mainly brought here from different districts of surroundings particularly for HB, PCV, TC, DLC and blood protozoa identification. Blood serum samples were examined for total protein, calcium, phosphorus, glucose, magnesium, brucellosis, etc. Examination of skin scraping & urine test was frequently conducted. Drug sensitivity test are in regular basis after bacterial culture of positive sample.

4.1 Parasitological examination

Fecal samples are brought by farmers directly, referred by the veterinary hospital or collected during surveillance and investigation program. In F/Y 2077/78, 1666 fecal samples were analyzed of which 1082 were from cattle, 552 and 32 from goat & examined. Among these samples 1500 samples (90%) were positive for intestinal parasites by fecal examination, which comprise of 974 cattle, 496 buffalo and 30 goats. The percentage of different parasites were Liver fluke (40%), *Paramphistomum* (28%), *Strongylus* (9%), *Trichuris* (4%), *Ascaris* (17%), *Toxocara* (1%) and *Monezia* (1%). Table and figure below represent the monthly data on fecal examination.



**Table: Different internal parasites observed in fecal examination
FY 2077-78**

Month	Samples	<i>Fasciola</i>	<i>Paramphistomum</i>	<i>Strongyles</i>	<i>Trichuris</i>	<i>Ascaris</i>	<i>Toxocara</i>	<i>Monezia</i>	Negative	Positive
Shrawan	148	42	35	17	8	38	3	3	2	146
Bhadra	279	102	68	11	9	34	4	2	49	230
Asoj	264	92	81	32	7	38	3	3	8	256
Kartik	142	37	26	26	7	18	2	2	24	118
Manshir	102	31	22	17	6	12	3	3	8	94
Poush	94	47	20	4	6	12	0	0	5	89
Magh	82	43	18	2	4	8	0	0	7	75
Falgun	73	31	23	4	4	7	0	0	4	69
Chaitra	92	34	34	4	4	12	0	0	4	88
Baisakh	114	49	27	5	5	27	0	0	1	113
Jestha	132	53	38	3	3	26	1	1	7	125
Asadh	144	47	24	5	5	16	0	0	47	97
Total	1666	608	416	130	68	248	16	14	166	1500

The EPG examination of the fecal sample is presented in table below.

Nematodes			
Species	Mild Infection	Moderate Infection	Severe Infection
	100-300	300-600	600-800
Cattle/ Buffalo	3	13	6
	300-500	1000-1500	2000-3000
Sheep/Goat	2	7	1

Trematodes			
Species	Mild Infection	Moderate Infection	Severe Infection
	50-100	100-200	200-400
Cattle/ Buffalo	23	73	94
	50-100	100-200	300-600
Sheep/Goat	4	9	2

4.2 Hematological examination

Blood samples were received from different districts. Total 218 blood samples (cattle-126, Goat-38, Dog-54) were examined for different blood parameters. Most of the dogs were anemic, where some of the cattle and goat has high lymphocyte and neutrophils count.

4.3 Blood protozoa examination

Total 106 samples (Cattle-36, Buffalo-48 & Goat-22) were received and examined for blood protozoa. Among them 79 samples were found negative for any blood parasites & rest 27 were positive for different blood parasites.

Buffalo

- Total no. of sample 48
- Total positive sample 11
 - Theileria- 6
 - Anaplasma- 3
 - Babesia- 2

Cattle

- Total no. of sample 36
- Total positive sample 9
 - Theileria- 6
 - Anaplasma- 3

Goat

- Total no. of sample 22
- Total positive sample 7
 - Anaplasma- 7

Blood samples examined and types of parasites found at Veterinary Laboratory, Janakpur

Month	No. of Sample	Anaplasma	Babesia	Theileria	Tryps	Other	-VE	+VE
Shrawan	7	2	-	1	-	-	18	
Bhadra	9	5	-	4	-	-	21	2
Asoj	8	-	2	2	-	-	15	2
Kartik	10	2	-	-	-	-	18	1
Manshir	8	-	-	3	-	-	20	2
Poush	9	-	-	-	-	-	26	
Magh	7	-	-	-	-	-	14	
Falgun	9	1	-	-	-	-	15	3
Chaitra	12	-	-	-	-	-	23	
Baisakh	11	-	-	-	-	-	28	
Jestha	9	-	-	2	-	-	21	1
Asadh	7	3	-	-	-	-	26	
Total	106	13	2	12	-	-	79	27

4.4 Serological Examination:

Total of 345 samples were examined. Details of the serological tests is presented in table below.

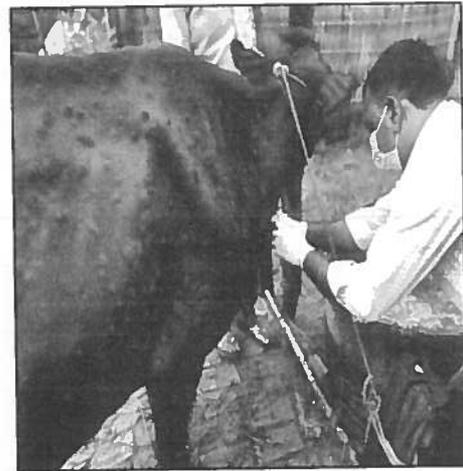
Disease	Animal Species	Test method	Positive number	Total tests
Brucellosis	Cattle/Buffalo/Goat	RBPT	0	108
PPR	Goat/Sheep	Agglutination	31	72
Mycoplasmosis	Poultry	Rapid Kit	32	100
Salmonellosis	Poultry	PAT	28	65
Total			91	345

4.4.1 FMD Investigation:

- Sample received from: Makawanpur
- Animal Spp.: Cattle & Goat
- Total no. of sample: 200
- Cattle: 100 & Goat: 100
- Total no. of sample tested: 200
- Test method: NSP ELISA

Test results:

Positive: 29
Cattle: 13
Goat: 16



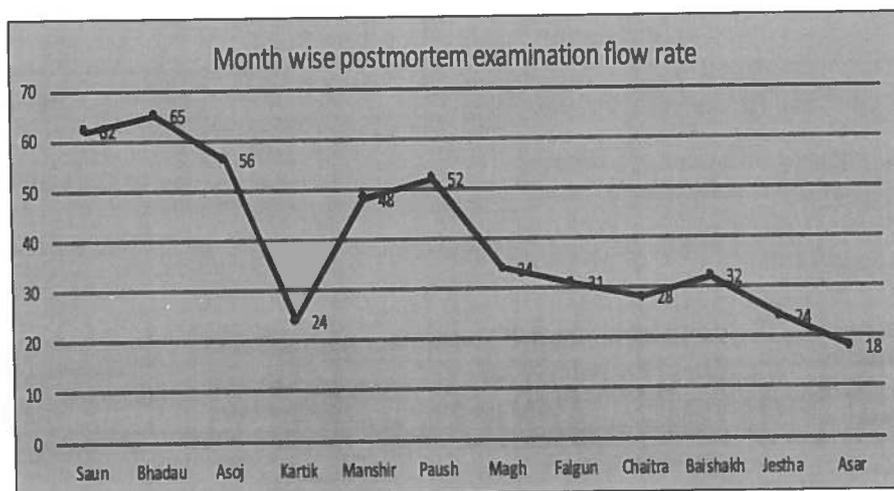
4.4.2 LSD Investigation:

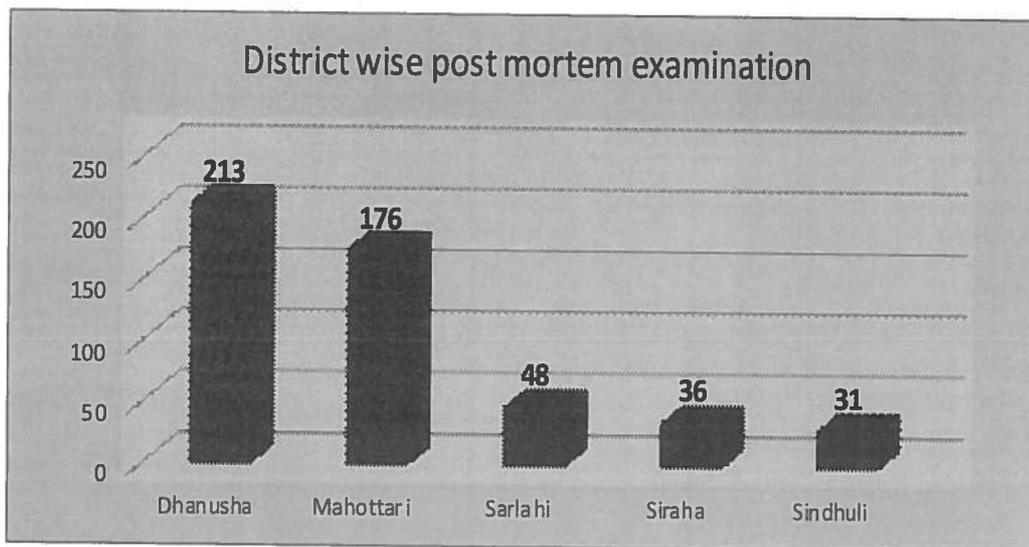
LSD outbreak occurred in Chandrapur municipality of Rautahat, Dudhauri municipality of Sindhuli and Sahidnagar Municipality of Dhanusha. Clinical samples from these outbreaks were collected and sent to CVL where it was confirmed as LSD.

4.5 Pathological Examination:

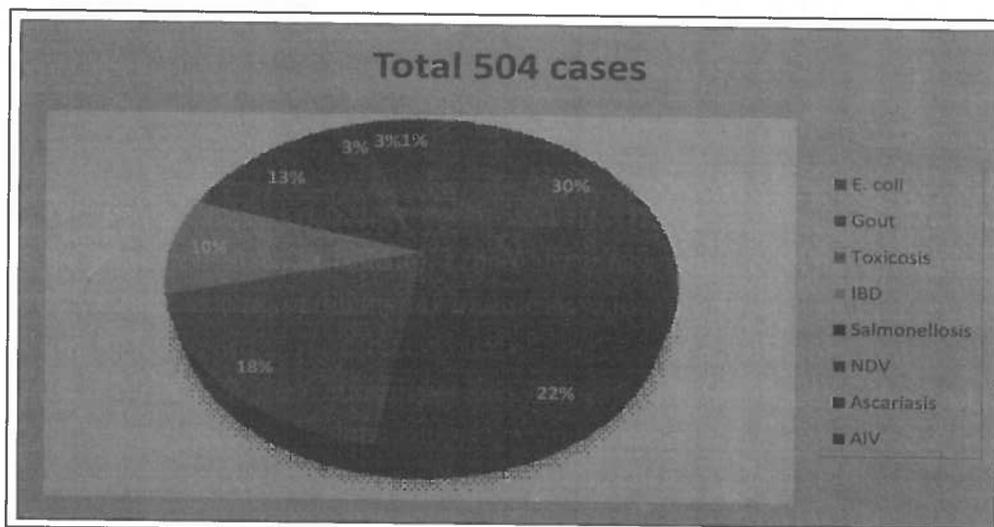
The pathological examination includes mostly post mortem examination of the dead birds received from commercial poultry farms. Most of the cases were from Dhanusha & Mahottari district and sometimes from Sindhuli, Sarlahi, Rautahat and Siraha district. A total 504 cases of post mortem examination were presented during the F/Y 2077/078 all the case received were birds. No cases of other species of animals were received. The status of poultry disease in the area is shown in Table.

Month wise postmortem case flow at veterinary laboratory Janakpur, FY 2077-78





Poultry diseases investigated in FY 2077-78



Trend of disease occurrence in poultry examined in FY 2077-78

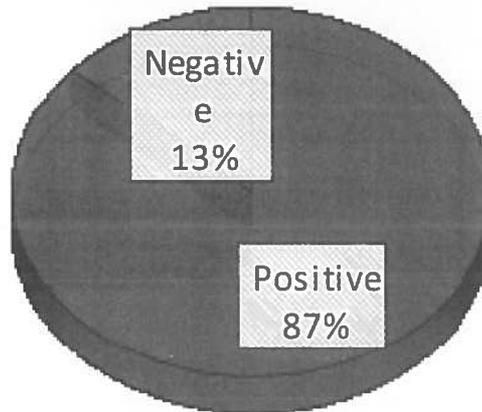
S.N.	Tentative Diagnosis	Total Cases	
		Number	Percent
1.	E.coli	152	30.15
2.	Gout	112	22.22
3.	Toxicosis	92	18.25
4.	IBD	48	9.52
5.	Salmonellosis	63	12.5
6.	New Castle Disease	13	2.57
7.	Ascariasis	17	3.37
8.	Avian Influenza	7	1.38
	Total	504	100

4.6 Microbiological examination:

4.6.1 Clinical mastitis:

The samples were brought by farmer's themselves. A total of 178 (Cow-102 & Buffalo-76) milk sample were tested for the presence of bacteria in milk. Among them, 154 samples were found positive (Cow-92 & Buffalo-62). The most prevalent bacteria isolated show *Staphylococcus*, *Streptococcus* & *E.coli* etc.

CLINICAL MASTITIS

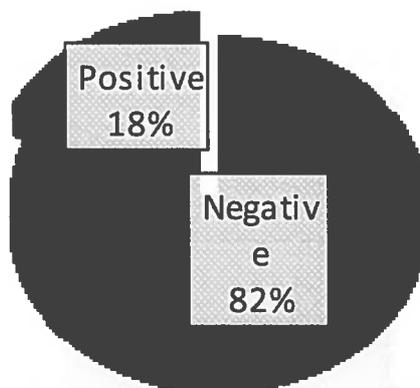


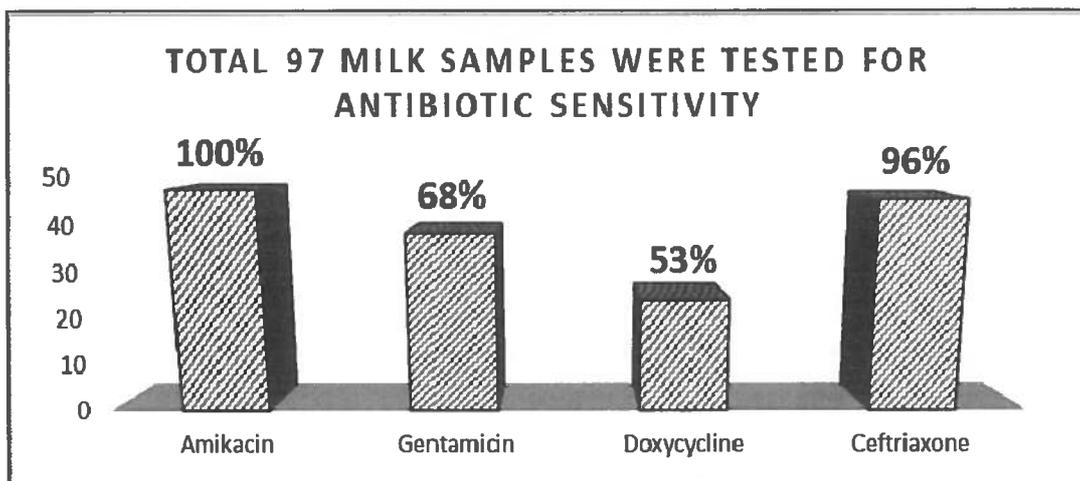
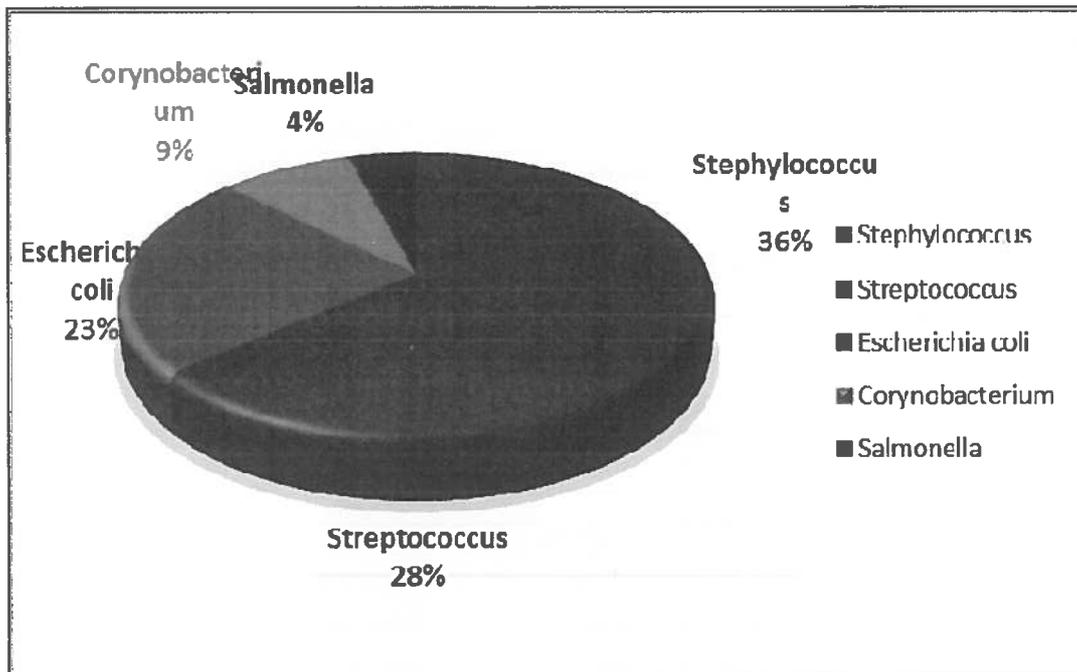
4.6.2 Sub-clinical mastitis:

A total of 124 (Cow-78 & Buffalo-44) milk samples were collected from commercial farms from Dhanusha, Mahottari and Sarlahi district and diagnosed at veterinary laboratory Janakpur for the bacterial identification in cow & buffalo milk.

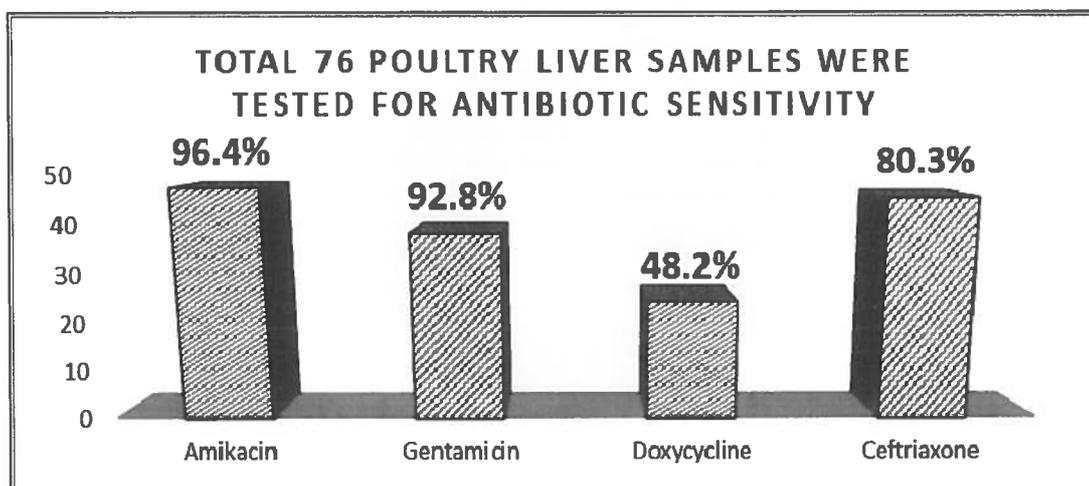
Among the 22 samples were found positive (Cow-15 & Buffalo-7). The most prevalent bacteria isolated show *Staphylococcus*, *Streptococcus* & *E. coli* etc.

SUB-CLINICAL MASTITIS





Antibiotic Sensitivity Test Results of bacterial culture from liver from poultry



4.7 Vaccine Seromonitoring

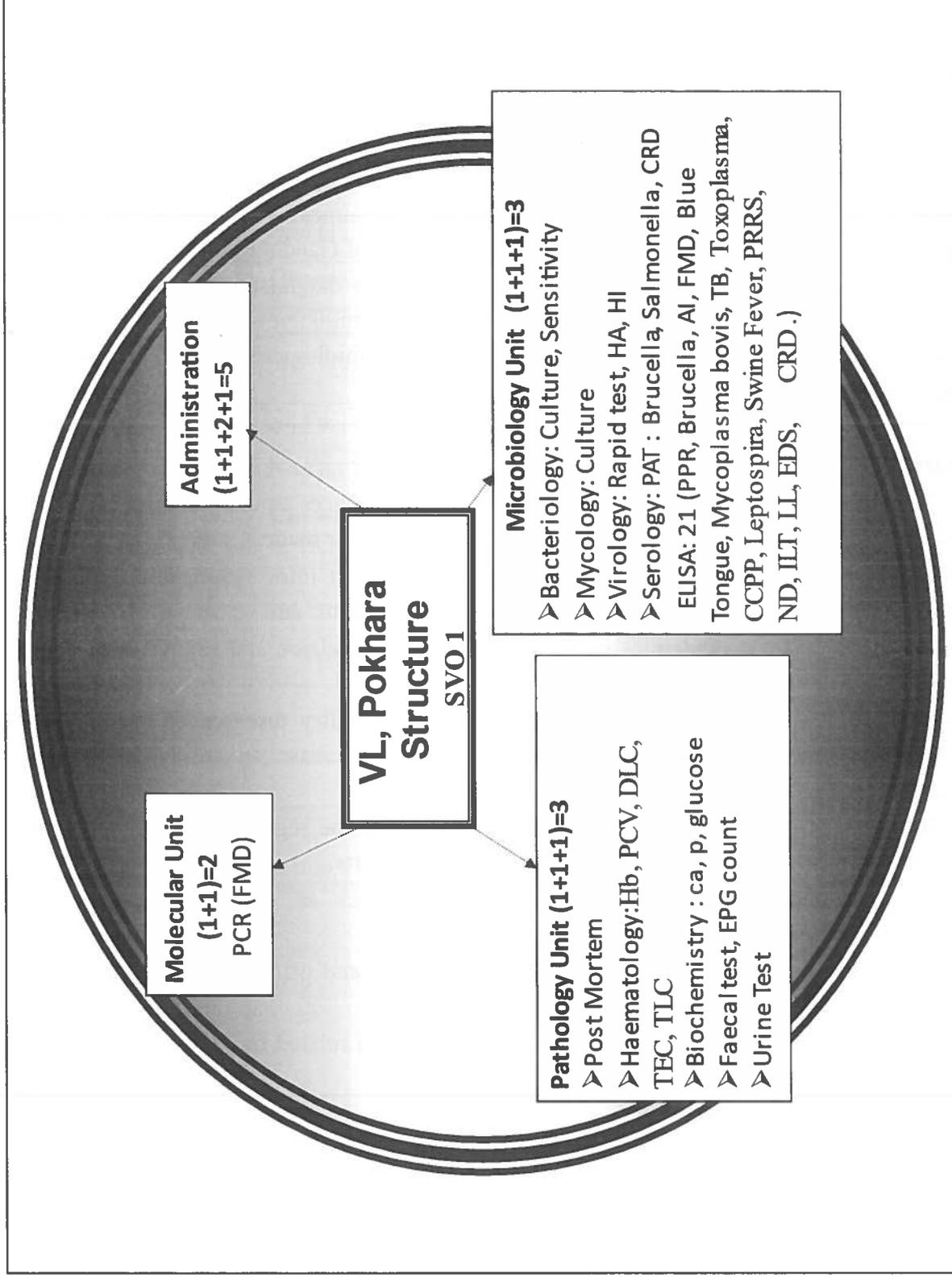
National FMD, PPR, NDV Vaccination Program Seromonitoring F/Y 2077/078

S.N.	Name of District	Samples collected (Animal Spp.)	Sero-monitoring for	Serum to be collected (No.)
1.	Dhanusha	Goat	PPR	200
2.	Mahottari	Goat	PPR	200
3.	Sarlahi	Goat	PPR	150
4.	Siraha	Goat	PPR	140
5.	Dhanusha	Poultry	Ranikhet	37
6.	Mahottari	Poultry	Ranikhet	42
7.	Mahottari	Cattle	FMD	80
8.	Rauthat	Cattle	FMD	150
9.	Bara	Cattle	FMD	52
	Total			1051

4.8 Bird flu Surveillance (F/Y 2077/078)

S.N.	District	Types of birds	Type of farming	Types of sample collected		Total	Test Result
				TS	CS		
1.	Dhanusha	Poultry, Duck	CB CB	42	22	64	-ve
				22	18	40	-ve
2.	Mahottari	Poultry	CB	24	16	40	-ve
3.	Sarlahi	Poultry	CB	21	17	38	-ve
4.	Sindhuli	Poultry	CB	12	12	24	-ve
5.	Bara	Poultry	CB	22	17	39	-ve
6.	Parsa	Poultry	CB	18	12	30	-ve
7.	Rauthat	Poultry, Duck	CB	24	14	38	-ve
				26	12	38	
8.	Siraha	Poultry, Duck	CB	12	12	24	-ve
				38	22	60	
	Total			261	174	435	-ve

3. Organizational Structure



4. Laboratory Services

4.1 Pathological Test

4.1.1 Hematological Examinations

SN	Species	Total Sample	Parasites found
1	Dog	143	Babesia (4), Anaplasma (3), Trypanosoma (2)
2	Cattle	21	Babesia (2), Theileria (1), Anaplasma (2)
3	Buffalo	14	-
4	Pig	7	<i>Bacillus spp</i> (2)
5	Horse	1	-
6	Goat	15	Babesia (2)
Total		201	

4.1.2 Biochemical Test

SN	Species	Total Sample	Major Findings
1	Bovine	185	Hypocalcemia, Hypoglycemia, Hypoproteinemia
2	Canine	21	

4.1.3 Poultry Diseases

Out of the total cases presented, 63% were broilers, 9% layers and remaining 28% were local, giriraj, fighter and turkey. Most of the cases (85%) recorded were from small farmers (<2000 birds), followed by 10% medium farmers (2000-5000 birds) and remaining 5% large farmers (>5000 birds). Majority of the cases were from Kaski (71%) followed by Tanahun (19.7%), Syangja (6.%) and other districts (3.3%) as shown in figure below.

Table: Monthly case flow in the laboratory for PM examination, FY 2077/78

Month / District	Kaski	Tanahun	Syangja	Parbat	Baglung	Myagdi	Lamjung	Nawalparasi	Gulmi	Total
Shrawan	257	46	18		3	2	1	1		328
Bhadra	124	39	19	4	8		5		1	200
Aswin	196	113	16	1	7	5	1			339
Kartik	276	130	19	6	6	5	4			446
Mangsir	245	80	22	2	1	6	4			360
Poush	150	78	27		1	1				255
Magh	253	29	16	2	1			1	2	304
Falgun	283	23	15	2	4	1				328
Chaitra	250	41	16		1	2	1			311

Table: Different poultry diseases diagnosed by PM, FY 2077-78

Diagnosis	Kaski	Tanahun	Syangja	Parvat	Baglung	Myagdi	Palpa	Gorkha	Lamjung	Nawalparasi	Gulmi	Total
Salmonellosis	142	43	13	0	0	0			1	0	0	199
Mycoplasmosis	128	20	14	0					2			164
IBD	193	15	16	3	0	3		1	2			233
ND	67	18	27	2	1	3		1				119
AIV	31	1	0	2	1		1					36
Coccidiosis	373	55	31	5	4	7		1	7			483
Total Cases												4857

4.2 Microbiology tests

4.2.1 Clinical Mastitis

Table: Total milk samples tested at the laboratory, FY 2077-78

SN	Species	SLST Positive	SLST Negative	Total
1	Cattle	298	178	476
2	Bufflao	203	144	347
3	Goat	7	3	10
	Total			833

Table: Bacterial isolates and AMR patterns, FY 2077-78

Type of sample	No. of sample	Organism isolated	No growth	Type of Bacteria isolated
Milk	292	209	83	<i>E. coli</i> , <i>Streptococcus spp</i> , <i>Staphylococcus spp</i>
Poultry liver	194	157	37	<i>E coli</i> , <i>Salmonella spp</i> , <i>Enterococcus spp</i>
Bone marrow	5	3	2	<i>Pasteurella hemolytica</i>
Urine	7	3	4	<i>E coli</i> , <i>Klebsiella spp</i>
Total	498	372	126	

Table: Anti-microbial resistant patterns for *E. coli* organism from milk and poultry liver sample, FY 2077-78

SN	Antibiotic Name	Sensitivity %	Intermediate %	Resistance %
1	Amoxycillin	12	65	23
2	Ceftriaxone	52	31	17
3	Ciprofloxacin	31	29	40
4	Chloramphenicol	21	46	33
5	Doxycycline	23	43	34
6	Cotrimoxazole	27	43	30
7	Enrofloxacin	43	24	33
8	Amikacin	78	14	8
9	Gentamicin	66	13	21
10	Levofloxacin	14	48	38
11	OTC	57	27	16

4.2.2 Sub-clinical mastitis screening test

Screening for sub-clinical mastitis performed in 94 randomly selected animals, out of which 50 were Jersey cross, 37 Holstein cross, 5 local cross bred and 2 were Hariyana. CMT was performed at the farmer's shed and 10 ml of milk sample from each quarter was collected in a sterile bottle from the animal that had CMT positive result. Bacterial culture and sensitivity was done in the laboratory. The result of the investigation is presented in table below.

Table: Screening of milking animals for SCM based on CMT, FY 2077-78

Screening Result n (%)		Quarter wise distribution of SCM			
Positive	Negative	Teat Location	Positive (n)	Negative (n)	Total Prevalence (%)
59 (62.77)	35 (37.23)	RF	29	65	30.85
		LF	37	57	39.36
		RH	28	66	29.79
Total: 94 milking cows		LH	20	74	21.28

Abbr.: RF, Right Front; LF, Left Front; RH, Right Hind; LH, Left Hind

Table: Distribution of different types of subclinical mastitis on animal and quarter basis

Culture Report	No of animals (94) n (%)	No of quarters (376) n (%)
Coliform mastitis	34 (57.63)	114 (30.32)
<i>Staphylococcus</i> mastitis	7 (11.86)	
<i>Streptococcus</i> mastitis	5 (8.47)	
No growth	13 (22)	

Sub-clinical mastitis test in the commercial cattle of Suklagandaki, Tanahun

Prevalence of Sub-clinical mastitis:

SLST Positive				Negative
Trace	+	++	+++	
3	2	12	9	19

Causative Organisms:

<i>Streptococcus spp</i>	<i>Staphylococcus Spp</i>	<i>E. coli</i>	<i>Bacillus spp</i>	<i>Pasturella spp</i>	No growth
6	1	9	1	1	6

4.3 Parasitology

Investigation of internal parasites in migratory animal flock

Study area: Annapurna Rural Municipality, Kaski, Gharapjhong Municipality, Mustang

Study population:

Address	Species		Age		Sex	
	Goat	Sheep	>1 Yr	<1 Yr	Male	Female
Annapurna-9, Kaski	78	68	107	39	39	107
Mustnag-4, Gharapjhong	75	62	114	23	333	104
Mustnag-5, Gharapjhong	75	47	100	22	32	90

Results : Strongyles: 20 Strongyloides: 22, Moneiza: 27 Eimeria: 26 Trichuris: 5
Fasciola: 19 Paramphistomes: 4 Total Prevalence: 88/405 = 21.7%

4.4 Vaccine Seromonitoring

4.4.1 PPR Seromonitoring

- Serum from sheep and goat was collected for estimation of efficacy of vaccination program (PPR homologous vaccine).
- The number of samples collected for sero-monitoring of PPR from different districts of Gandaki and province-5 is presented below:

District	Total sample tested	Positive	Negative	Seropositive (%)
Lamjung	92	72	20	78.26
Syangja	93	78	15	83.87
Tanahun	152	124	28	81.57
Kaski	145	118	27	81.37
Parbat	120	97	23	80.83
Total	602	489	113	81.5

4.4.2 FMD Seromonitoring

- A total of 159 animals were selected from various parts of Machhapuchhre Rural Municipality, Kaski district of Gandaki province from FMD vaccinated animals.
- Seromonitoring was done by ID-Screen® FMD Type O Competition ELISA kit.

Table: Test result and seropositivity of FMD vaccination

Total number of samples	Test result		Seropositivity (%)
	Number of positive samples	Number of negative samples	
159	135	24	83.89%

4.4.3 Classical Swine Fever (CSF) vaccine seromonitoring

Sample Size: 79

Results: 36% seropositive

4.5 Investigation for different animal diseases

4.5.1 Rabies

Table: Rabies cases diagnosed at the laboratory, FY 2077-78

SN	Species	Address	Type of test	Remarks
1	Caprine	Byas-3, Tanahun	Rapid Ag test	Positive
2	Caprine	Pokhara 17 Kaski	Rapid Ag test	Positive
3	Dog	Pokhara 14	Rapid Ag test	Negative
4	Caprine	Pokhara 21, Kaski	Rapid Ag test	Negative
5	Dog	Byas 1 Tanahun	Rapid Ag test	Positive
6	Dog	Pokhara 33	Rapid Ag test	Negative
7	Buffalo	Pokhara 24 Kaski	Rapid Ag test	Positive
8	Goat	Suklagandaki 6 Tahanun	Rapid Ag test	Negative
9	Cattle	Pokhara 33 kaski	Rapid Ag test	Positive

4.5.2 PPR Outbreaks

Table: PPR test results by Penside and Rapid kit (ID-Vet), FY 2077-78

Districts	Positive	Negative	Total Test
Kaski	14	17	31
Tanahun	2	12	14
Rupandehi	14	7	21
Kapilvastu	2	5	7
Lamjung	1	7	8
Parvat	1	9	10
Myagdi	0	2	2
Palpa	0	4	4

4.5.3 Zoonotic Disease Investigation

1. Brucellosis

385 serum samples were randomly collected from the cattle farms of Kaski district. All serum samples were tested by both Rose Bengal seropositive and antibody ELISA. None of the samples were positive in Brucellosis test.

2. Leptospirosis

Total of 87 blood samples (75 cattle and 12 buffalo) from animals with infertility and other reproductive problems were analyzed. There were 35 samples from Tanahun, 35 from Nawalpur and 17 from Gorkha districts were analyzed. The serum was then subjected for ELISA as per the guidelines provided in PrioCHECK[®] L. hardjo Antibody Test Kit (Prionics).

Antibodies against *Leptospira* sp were detected in 1 out of 87 collected blood samples (1.14%) from bovine in ELISA test (PrioCHECK[®] L.hardjo Ab ELISA kit). The affected animal had history of early embryonic death.

3. Cysticercosis

Total of 87 Blood samples was aseptically obtained from pigs of both sexes in commercial pig farms. The presence of antibodies of porcine cysticercosis was determined with antibody ELISA. The prevalence of cysticercosis was identified as 6.89%.

4. Tuberculosis

A total of 191 milk samples were collected from different cattle farms of Kaski district. Samples were tested for *Mycobacterium bovis* using ELISA. A total of 28 samples were positive. Prevalence = 14.66%.

4.5.4 Avian Leucosis Complex (ALC)

A total of 40 cloacal samples were received from suspected commercial layers farm of Tanahun district. The samples were tested for ALC using ELISA Kit (IDEXX[®]). A total of 8 samples out of total 40 samples tested were positive for ALC.

4.5.5 Lumpy Skin Disease (LSD)

SN	R/Municipality	Ward	District	Species	Breed	Total sample	Test Method	Result
1	Annapurna	3	Kaski	Cattle	Jersey	5	PCR/ELISA	Positive
2	Annapurna	3	Kaski	Cattle	Jersey	2	ELISA	Positive
3	Annapurna	3	Kaski	Cattle	Jersey	5	PCR/ELISA	Positive
4	Pokhara	25	Kaski	Cattle	Jersey	6	PCR/ELISA	Positive
5	Pokhara	25	Kaski	Cattle	Jersey	3	PCR/ELISA	Positive

SN	R/Municipality	Ward	District	Species	Breed	Total sample	Test Method	Result
6	Pokhara	25	Kaski	Cattle	Jersey	6	PCR/ELISA	Positive
7	Pokhara	11	Kaski	Buffalo	Murrah	9	PCR/ELISA	Positive
8	Pokhara	13	Kaski	Buffalo	Murrah	3	PCR/ELISA	Positive
9	Vyas	11	Tanahun	Cattle	Jersey	3	PCR/ELISA	Positive
10	Madhya Nepal	7	Lamjung	Cattle		5	ELISA/PCR	Positive
11	Tilottama	12	Rupandehi	Cattle		2	ELISA/PCR	Positive
12	Sainamaina	5	Rupandehi	Cattle		12	ELISA/PCR	Positive
13	Gaindakot	10	Nawalpur	Cattle		2	ELISA/PCR	Positive
14	Gaindakot	13	Nawalpur	Cattle		2	ELISA/PCR	Positive
15	Gaindakot	13	Nawalpur	Cattle		2	ELISA/PCR	Positive
16	Gaindakot		Nawalpur	Cattle		2	ELISA/PCR	Positive
17	Vyas	13	Tanahun	Cattle		2	PCR	Positive
18	Pokhara	25	Kaski	Cattle		2	ELISA/PCR	Positive
19	Kawasoti	6	Nawalpur	Cattle		2	ELISA/PCR	Positive
20	Kawasoti	3	Nawalpur	Cattle		7	ELISA/PCR	Positive
21	Galyang	2	Syangja	Cattle		11	ELISA	Negative
22	Baglung	3	Baglung	Cattle	Jersey	1	ELISA	Positive
23	Baglung	3	Baglung	Cattle	Jersey	1	ELISA	Negative
24	Baglung	3	Baglung	Cattle	Jersey	1	ELISA	Positive
25	Baglung	3	Baglung	Cattle	Jersey	1	ELISA	Positive
26	Baglung	3	Baglung	Cattle	Jersey	1	ELISA	Negative
27	Baglung	3	Baglung	Cattle	HF	1	ELISA	Positive
28	Baglung	3	Baglung	Cattle	HF	1	ELISA	Negative
Total no of samples tested						100		

4.6 Drug Residues

4.6.1 Drug Residues in milk and meat

A. Quantitative evaluation of residues in milk

A total of 90 milk samples (30 each from Baglung, Kaski and Tanahun) were collected. 10 ml of samples was collected from milk collection center. Each samples were tested for Gentamicin, Fluoroquinolone, Ivermectin and Streptomycin.

A total of 16 dairy owners were found to collect milk even from mastitis animal either knowingly or unknowingly about the history of animals. 59/90 owners were found known about the withdrawal period of different antimicrobials. 79/90 dairy farmers were regularly cleaning the milk can. 3/90 milk samples were collected from the animals recently treated with antimicrobial which was unknown to the milk collector. Residues were obtained for the drugs and tabulated as unsafe as shown in table below.

Table: Milk samples from three different districts safe and unsafe for human consumption

Antimicrobials MRL value (ppb); Codex Alimentarius	Baglung		Kaski		Tanahun	
	Samples (n=30)		Samples (n=30)		Samples (n=30)	
	Safe sample	Unsafe sample	Safe sample	Unsafe sample	Safe sample	Unsafe sample
Ivermectin (0-10)	30	0	30	0	30	0
Gentamicin (0-20)	30	0	29	1	29	1
Streptomycin (0-50)	30	0	29	1	29	1
Fluoroquinolones(0-30)	30	0	28	2	29	1

B. Qualitative Evaluation of antibiotic residue in milk and meat

A total of 113 samples were collected (61 from Nawalpur, 35 from Myagdi and 17 from Syangja) for evaluation of antibiotic residue in milk. Samples were collected from commercial dairy farms and dairy shop. Samples were tested by RR Test Kit manufactured by RODEJANARUG PHARMACEUTICAL Limited Partnership, Thailand. A total of 46 (40.71%) samples were positive for antibiotic residue in milk. Number of positive samples in each district is presented in figure below.

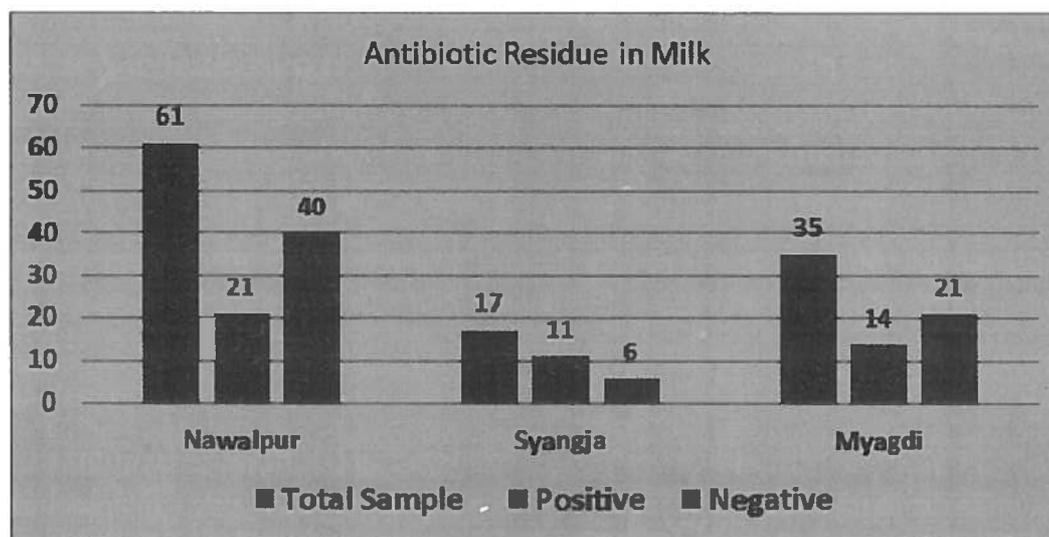


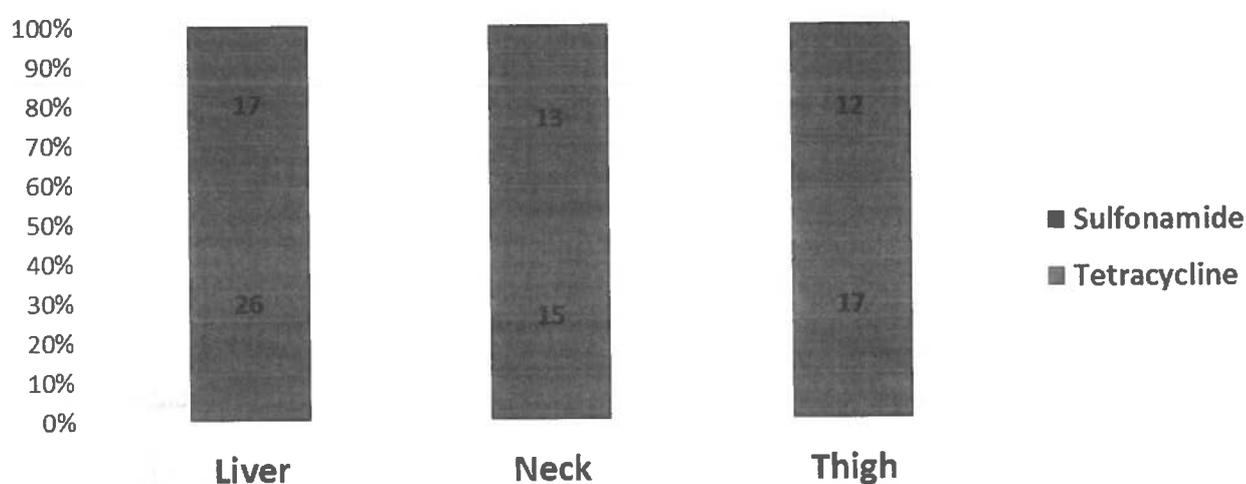
Figure: Antibiotic residues in milk from different districts of Gandaki Province, FY 2077-78

Samples from antibiotic residue testing in meat by qualitative method was done by collection of 168 meat samples (84 from Rupandehi, 42 from Palpa and 42 from Pashchim Nawalparasi) from Lumbini Province. Samples include liver, thigh muscle and neck muscle collected from the meat market. Samples were tested by RR Test Kit manufactured by RODEJANARUG PHARMACEUTICAL Limited Partnership, Thailand. Number of positive samples in each

district is given in table and figure below. Total of 33 samples (39.28%) were positive for more than one antibiotic in qualitative testing.

District	Total Sample	Tetracycline		Sulfonamide	
		Positive	Negative	Positive	Negative
Rupandehi	84	27	15	25	17
Nawalparasi	42	17	4	11	10
Palpa	42	14	7	8	13
	168	58	26	44	40

Organwise Result for Antibiotic Residue



5. Regional Vaccine Bank

District	FMD	PPR	CSF	HS BQ	Rabies	ND
Mustang	2826	40000	8	623	245	
Baglung	9860	35595	460	6530	104	
Gorakha	13496	183229	4741	8341	898	20000
Syangja	4218	20570	92	3378	308	
Lamgunj	17418	112562	661	11711	1800	
Nawalparasi East	28888	122553	9034	18593	50	
Tanahun	23742	119003	9595	6091	2507	
Myagdi	6086	27336	67	5901	215	
Parwat	7934	41507	513	7421	289	
Namang		4027				
Palpa		93500	10800			25000
Gulmi		73000	16000			1000
Total	114468	872882	51971	68589	6416	46000

VETERINARY LABORATORY SURKHET

1. Introduction

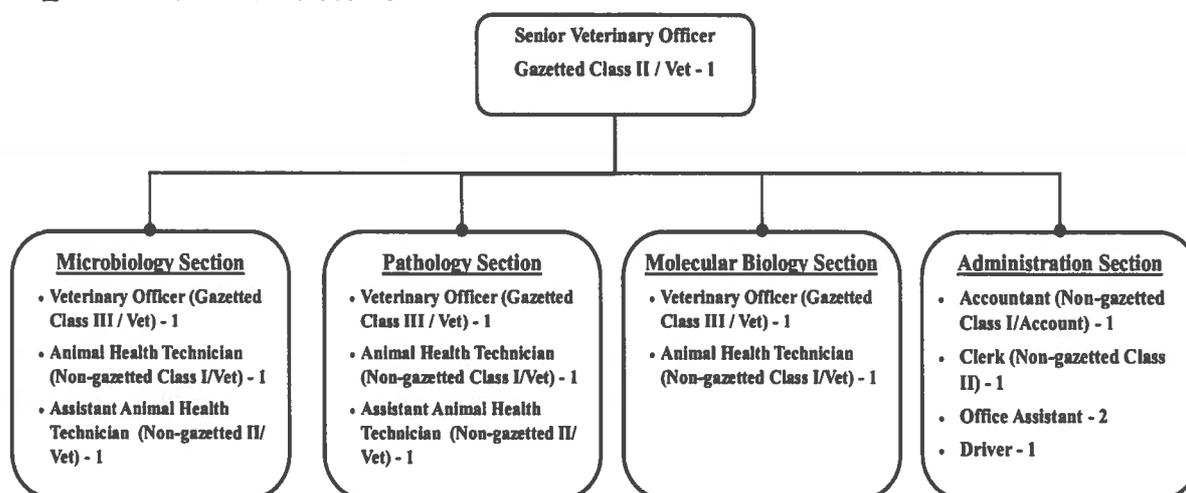
Veterinary Laboratory (VL), Surkhet is located at Birendranagar Municipality-7, of the Karnali Province . Since its establishment in F/Y 1988/1989 AD, it has been providing diagnostic services in ten districts of Karnali Province and six districts of Lumbini Province. The diagnostic services has been further supported after establishment of basic labs in Banke, Dang and Jumla districts which perform parasitological examination including microbiological culture and antibiotic sensitivity test.

The mission of the VL, Surkhet is to promote the health of livestock, poultry and ensure safe animal products for consumer by assisting Veterinary Hospital and Livestock Service Expert Centers (VHLSEC), veterinarians, animal health workers, and others who are responsible for animal health in detection and prevention of animal diseases.

2. Objectives

- To provide veterinary diagnostic services to the farmers of the region.
- To investigate the animal disease epidemics in the region.
- To support VHLSEC in disease diagnosis and epidemic control.
- To investigate important livestock diseases & assist disease control measures in the region.
- To monitor and report the incidence and threat of animal disease as well as zoonotic disease
- To supervise diagnostic service at VHLSECs of the region and onsite coaching.
- To conduct and support animal health related programs such as lab trainings among the veterinary paraprofessionals in the region.
- To assist in overarching goal of the national disease control and eradication in the region.

3. Organizational structure



S.N.	Designation	Class	Number of Post	Fulfilled	Remarks
1	Senior Veterinary Officer	Gaz.2	1	1	
2	Veterinary Officer	Gaz.3	3	3	
3	Animal Health Technician	Non.Gaz.1	3	3	
4	Asst. Animal Health Technician	Non.Gaz.2	2	2	
5	Accountant	Non.Gaz.1	1	1	
6	Kharidar	Non.Gaz.2	1	1	
7	Driver	Class less	1	1	
8	Office Helper	Class less	2	1	
	Total		14	14	

4. Laboratory Services

4.1 Parasitological examination

Parasitological unit examines the fecal samples of animal species using different methods to estimate the parasitic burden of the nematode, trematode and cestode by various methods. A total of 923 faecal samples were examined and 364 were found positive for various internal parasites. Among them *Fasciola*, *Coccidia*, *Haemonchus*, *Strongylus*, *Paramphistomum*, *Trichuris*, were found major internal parasites identified. Reports of faecal examination is presented in table below.

Table 2: Fecal examination of different animal conducted at VL, Surkhet (FY 2077/078)

Parasites	2077/078	Percentage
<i>Fasciola</i>	132	17.91
<i>Paramphistomum</i>	42	5.70
<i>Ascaris</i>	41	5.56
<i>Trichuris</i>	63	8.55
<i>Strongylus</i>	32	4.34
<i>Monezia</i>	30	4.07
<i>Toxocara</i>	21	2.85
<i>Haemonchus</i>	80	10.85
Negative	296	40.16
Total	737	100

Skin Scraping Test

Out of 54 skin scrapings tested, 2 sample were found positive to Sarcoptic mite.

4.2 Clinico-Hematological Test

Altogether, 360 sample were tested in clinico-hematological unit.

4.3 Urine Test

Out of 52 urine samples tested 6 samples were tested abnormal.

4.4 Microbiological examination

The count of major samples submitted for the microbiological examinations were milk, water, tissue feed as shown in in table and figure below.

SN	Sample Type	Number
1	Tissue	83
2	Milk	121
3	Water	32
4	Fish	8
5	Swab	11
6	Feed	20
7	Straw	3
8	Egg	1
Total		279

Out of 279 samples submitted at microbiology, 208 and 13 samples produced bacteria and fungus respectively. The distribution of major bacterial isolates are described in table below.

S.N.	Name of Bacterial Isolate	No of Isolates
1	E. coli	61
2	Salmonella	8
3	Streptococcus	8
4	Staphylococcus	32
5	Pseudomonas	10
6	Proteus	15
7	Bacillus	8
8	Klebsiella	16
9	Shigella	0
10	Fungus	32
11	No Growth	68
Total		240

4.5 California Mastitis Test Result

California mastitis test was used to diagnose clinical and sub clinical mastitis of animal in laboratory as well as in field level. Total 390 milk sample were tested. Among them 114 sample were positive and the antibiotic sensitivity of the milk bacterial isolates are depicted in table as follows.

CMT Test	Positive	Negative	Total
No of Sample tested	114	276	390

4.6 Antibiotic Sensitivity

SN	Antibiotic Name	Sensitivity %	Intermediate %	Resistance %
1	Amikacin	61	23	16
2	Amoxicillin	9	57	34
3	Cephalexin	65	30	5
4	Ciprofloxacin	34	27	39
5	Chloramphenicol	46	42	12
6	Spectinomycine	62	33	5
7	Colistin	10	46	44
8	Enrofloxacin	20	48	32
9	Azithromicin	55	37	8
10	Gentamicin	47	31	22
11	Levofloxacin	52	18	30
12	Tetracycline	29	56	15
13	Cetrixone	22	9	8

4.7 Antibiotic Residue Test

Residue test in meat sample

Out of total tests, antibiotic residue was found positive in 44% in milk and 24% in meat samples.

Residue test in milk sample

In 50 milk sample collected from Surkhet district about 11.53% positive in Antibiotic Residue test. Among them 21 sample were taken from buffalo and 5 samples from cattle. In buffalo milk sample 9.52% positive in Antibiotic Residue test.

60 milk sample collected from Bardiya District and 28 samples collected from Banke District for residue test. Among 88 sample of milk Gentamicin was found positive in 11 sample (12.5%). 2 sample from cattle milk, 3 sample from buffalo milk and 6 sample from mixed milk were positive through in ELISA Test Kit.

4.8 Pathological examination

The pathological examination includes mostly postmortem examination of poultry received from commercial poultry farms. Most of the cases were brought from Birendranagar Municipality and surrounding Rural Municipalities and Municipality like as Lekbesi, Simta, Bheriganga, Gurbakot, Barahatal and some Municipality and rural Municipality of Banke, Bardiya and Dang District for pathological examination. The month wise poultry diseases according to post-mortem examination is shown in table below.

Postmortem	Shrawan	Bhadra	Ashwin	Kartik	Mansir	Poush	Magh	Falgun	Chaitra	Baishak	Jestha	Ashar	Total
Colibacillosis	13	12	9	11	18	19	15	7	13	9	9	10	145
CRD	1	0	1	3	2	2	0	2	2	0	4	2	19
IBD	4	4	4	15	14	10	8	6	4	3	14	9	95
ND	0	0	1	2	8	13	17	18	17	8	5	13	102
Ascites	3	4	2	2	1	7	11	8	2	1	1	2	44
Gout	0	0	1	1	0	5	0	1	0	1	0	0	9
Mycotoxicity	21	22	22	16	12	27	21	2	10	9	11	25	198
Other	37	35	23	25	29	32	32	29	28	18	33	36	357
Total	66	77	60	75	84	115	104	71	61	49	74	90	969

4.9 Virological examination

A total of 1544 samples of different domestic animal were collected at field level for virological analysis through rapid test kit. The results of the test are presented in the table below.

S.N	Rapid Antigen Test	Positive	Negative	Total
1	AI	23	509	532
2	IBD	88	293	381
3	ND	67	319	496
4	IB	8	221	229
5	Rabies	4	12	16
Total		190	1354	1544

4.10 Serological examination

A total of 1410 serum samples of different domestic animal were collected and tested at VL, Surkhet. The results of the test are presented in the table below.

Table 3: Result of plate agglutination test in different diseases (FY 2077/078)

S.N.	Conducted Test	Total Sample Tested	No of Positive Sample	Positive %
1	Rose Bengal Plate test	502	0	0
2	Salmonella Plate test	329	103	31.30
3	Mycoplasma Plate test	329	140	42.55
4	PPR Penside Test	250	16	6.4
5	Total	1410	259	

4.11. National PPR Program

Under the National PPR Control program, Department of Livestock Services had provided 1035000 doses of PPR vaccine for 16 districts of this region. Vet Lab Surkhet supported the program by sero-monitoring. Sample were collected FY 076/077 and tested in FY 2077/078. District-wise collection of serum sample and laboratory test result is presented in the table below.

S.N,	Name of District	Target of Sample	Collected Sample	Test Sample	Positive	Negative	Positive Percent
1	Banke	350	357	184	170	14	92.4
2	Bardiya	350	315	92	84	8	91.3
3	Dailekh	325	184	92	84	8	91.3
4	Dang	405	409	184	158	26	85.9
5	Humla	130	130	92	91	1	98.9
6	Jajarkot	195	202	92	79	13	85.9
7	Jumla	170	177	92	64	28	69.6
8	Kalikot	125	130	92	88	4	95.7
9	Pyuthan	225	226	92	79	13	85.9
11	Rolpa	230	198	92	77	15	83.7
12	Rukum Paschim	125	137	92	90	2	97.8
13	Rukum Purba	113	113	92	57	35	62.0
13	Salyan	313	318	92	86	6	93.5
14	Surkhet	425	428	184	168	16	91.3
	Total	3481	3324	1564	1375	189	87.9

4.12 Additional activities

भूमी व्यवस्था कृषि तथा सहकारी मन्त्रालय बाट प्राप्त कार्यक्रमको संकलित नमूनाहरूको परिक्षण विवरण

क्र.सं.	ठेगाना	स्वाब				सिरम				स्वाब कुबुरा			
		जम्मा संकलित नमूना संख्या	जम्मा परिक्षण नमूना संख्या	PPR AG ELISA नतिजा		जम्मा संकलित नमूना संख्या	जम्मा परिक्षण नमूना संख्या	FMD NSP ELISA नतिजा		नतिजा	नतिजा	Rapid Test Result	
				Neg	Pos			Neg	Pos			Neg	Pos
१	भेरीगंगा, सुर्खेत	३४	३४	२५	९	४८	४८	४६	२	०	०	०	०
२	बराहताल, सुर्खेत	३५	३५	१६	१९	३५	३५	२९	६	१०५	१०५	०	०
३	लेकवेशि, सुर्खेत	५४	५२	४५	७	५७	५७	५४	३	०	०	०	०
४	नारायण/महाबु, दैलेख	५१	४६	३४	१२	५१	५१	४५	६	७	७	०	०
५	लेकवेशि/बि. न.पा., सुर्खेत	१६	१५	१४	१	३८	३८	३८	०	०	०	०	०
६	लेकवेशि, सुर्खेत	६२	६२	५९	३	६२	६१	६०	१	०	०	०	०
७	भगवतिमाई, दैलेख	५६	५६	५०	६	८१	८१	७६	५	०	०	०	०
८	गुराँस, दैलेख	६६	४६	३२	१४	६६	५९	५५	४	०	०	०	०
९	शारदा, सल्यान	१००	८६	६९	१७	१०६	१०५	१००	५	०	०	०	०
	जम्मा	४७४	४३२	३४४	८८	५४४	५३५	५०३	३२	११२	११२	०	११२

5. Regional vaccine bank

In FY 2077/78, vaccines of PPR and ND were distributed in different districts as the part of animal disease control program. Details of the distribution is mentioned in table below.

Table: List of vaccine distribution of PPR and ND

S.N	District	PPR	ND
1	Surkhet	186000	20000
2	Dailekh	147000	20000
3	Salyan	264000	20000
4	Jajarkot	80000	20000
5	Jumla	55000	10000
6	Kalikot	40000	10000
7	Humla	60000	0
8	Dolpa	50000	0
9	Mugu	45000	0
10	West Rukum	99000	10000
11	Dang	260000	0
12	Banke	250000	0
13	Bardiya	250000	0
14	Rolpa	150000	20000
15	Pyuthan	140000	20000
16	East Rukum	50000	0
	Total	1076000	150000

VETERINARY LABORATORY DHANGADHI

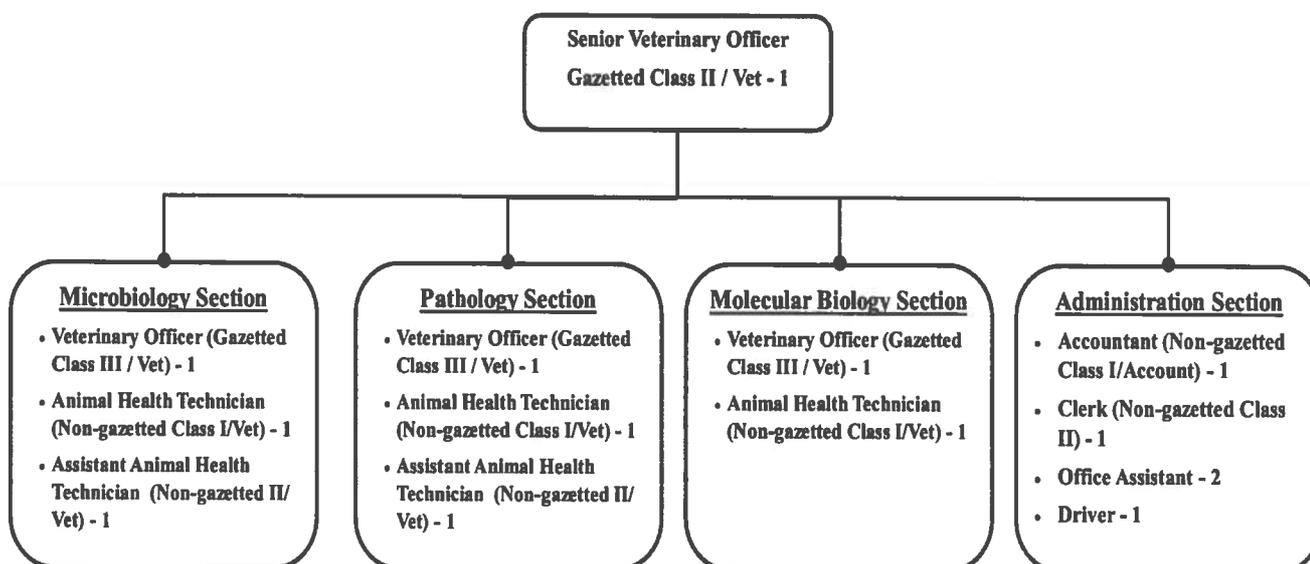
1. Introduction:

Veterinary Laboratory is situated in Dhangadhi sub metropolitan city of Sudurpachhim Pradesh of Nepal. This laboratory was established in 2049 BS as with the name of Regional Veterinary Laboratory. With the administrative reconstruction of Nepal during the year 2074/75, the laboratory was renamed as Veterinary Laboratory. The laboratory was established as the laboratory of the far western region with its service area covering the nine districts & two zones.

2. Objectives

- ❖ To provide prompt and efficient disease diagnostic services to the farmers of Sudurpaschim province.
- ❖ To investigate and diagnose the epidemics in the province.
- ❖ To assist and support Veterinary Hospital and Livestock Service Expert Centers (VHLSEC) and local level governments in disease diagnosis and epidemic control.
- ❖ To supervise and assist in diagnostic services to basic and primary laboratories situated in Veterinary Hospital and Livestock Service Expert Centers in the province.
- ❖ To collect, analyze and predict the animal diseases prevailing in the province.
- ❖ To develop human resources for the field level veterinary services.
- ❖ To co-ordinate and support national livestock disease control and eradication program.
- ❖ To support and facilitate the national veterinary regulatory services.
- ❖ To participate actively in collaborative and coordinated research program in animal health and production in the region.

3. Organizational Structure



The human resource for FY 2077-78 is given in table below.

S.N.	Type of post	Class	No.	Fulfilled	Remark
1	Senior veterinary officer	G .II	1	1	
2	Veterinary officer	G.III	3	3	
3	Animal health technician	NG .I	3	3	
4	Assistant animal health technician	NG II	2	2	
5	Accountant	NG I	1	1	
6	Clerk	NG2	1	1	
7	Driver	No class	1	1	
8	Office helper	No class	2	2	

4. Laboratory services

The routine laboratory works of veterinary laboratory Dhangadi, mainly involves examination of fecal sample, postmortem examination, sero-surveillance, CMT test of milk samples and bacterial culture and drug sensitivity test. Besides these hematological and biochemical test, rapid test and serological test are routinely conducted. Examination of skin scraping & urine test was frequently conducted in VL Dhangadi.

4.1 Parasitology

A total of 318 faecal samples were tested for different parasitic conditions of livestock populations out of which 86.47% samples were positive. The most common helminthes identified during faecal examination were Fasciola sps., Paramphistomum sps., Strongylus sps., Hemonchus sps., Trichuris sps. and coccidia. Likewise, a total of 45 skin scraping samples were tested, 11% samples were found to be positive.

4.2 Serology

A total of 615 poultry serum samples were tested for salmonellosis and mycoplasmosis by PAT method among which 44.48% and 34.17% samples were positive for salmonellosis and mycoplasmosis respectively. Likewise a total of 150 samples were tested for brucellosis, 18.67% of samples were positive.

Laboratory test results of PAT, FY 2077/78

	Disease Name	Sample Tested	Result	
			Positive	Negative
1.	Salmonellosis	299	133	166
2.	Mycoplasmosis	316	108	208
3.	Brucellosis	150	28	122

4.3 Pathology

During the fiscal year 077/78, a total of 728 cases were registered for postmortem examination. The tentative diagnosis of disease through PM observation are presented in the table below.

S.N.	Disease/condition	Number of farms	Percentage
1	Infectious bursal disease	127	17
2	Colibacillosis	99	14
3	New Castle Disease	85	12
4	Toxicity	78	11
5	Sudden death syndrome	72	10
6	Stress	67	9
7	Chronic respiratory disease	47	6
8	Avian influenza type A	33	5
9	Ascites	31	4
10	Nonspecific death	19	3
11	Salmonellosis	18	2
12	Enteritis	16	2
13	Ascariasis	9	1
14	Coccidiosis	7	1
15	Immunosuppression	6	1
16	Early chick mortality	5	1
17	Mixed Infection	4	1
18	Gout	3	0.4
19	Fowl Pox	2	0.3

Rapid test results

S.N.	Disease Name	Test method	Sample Tested	Result	
				Positive	Negative
1.	Peste des petits ruminants (PPR)	Antigen test + Penside test	131	57	74
2	Rabies	Antigen test	15	7	8
3	Avian Influenza Type A	Antigen test (rapid method)	792	30	762
4	New Castle Disease		456	39	417
8	Infectious Bursal Disease		395	51	344

4.4 Haematology and Biochemistry

A total of 200 samples were examined for haematological parameter like TLC, DLC, PCV and Haemoglobin estimation. A total of 150 samples were tested for blood protozoa, 4.66% of samples were positive.

4.5 Microbiology

A total of 333 tissues samples and 220 milk samples were tested. The result of microbiological test is presented in the table as below:

Animal type	Sample type	Number of samples tested	Positive culture	Major bacteria identified
Cattle / Buffalo, Goat	Milk	220	81	<i>Streptococcus, Staphylococcus, E.coli, Bacillus</i>
Goat	Liver, spleen, kidney	12	8	<i>Pasteurella, Streptococcus, Staphylococcus, E.coli</i>
Poultry	Liver, lungs, heart	313	198	<i>E.coli, Streptococcus, Enterococcus, Staphylococcus</i>
Pig	Liver, spleen, kidney	8	8	
Total		553	295	

The milk samples positive for California mastitis were tested for antibiotic sensitivity test following preliminary culture in order to choose right antibiotic for the treatment of mastitis. The result of antibiotic sensitivity test (Muller Hinton Agar) showed that Ceftriaxone, Ciprofloxacin, Tetracycline and Gentamicin was more effective in mastitis (milk samples). Likewise, Amikacin, Ciprofloxacin, Levofloxacin, Gentamicin, Enrofloxacin and Chlortetracycline were more sensitive in tissue samples (poultry).

Investigation of sub clinical mastitis in dairy animals

This program was conducted to know the prevalence of sub clinical mastitis in milking cattle & buffaloes of. A total of 200 cow milk and 214 buffalo milk samples from Kailali (86 farms, 207 samples) & Kanchanpur (67 farms, 207 samples) districts were tested by CMT method. 16.42% of samples were positive.

4.6 Different disease investigation

4.6.1 PPR Outbreaks in FY 2077-78

District	Outbreaks	Animal type	No. of affected animals	No. of deaths	No. of animals at risk
Dadeldhura	1	Goat	321	8	5800
Baitadi	1	Goat	200	9	3400
Kailali	9	Goat	2628	78	25000
Kanchanpur	4	Goat	1235	34	3800
Bajura	1	Goat	230	21	2500
Total	16		4614	150	40500

4.6.2 Investigation of Kumri in Goats

Apart from above activities this laboratory has performed a Kumri in Goat investigation program in Kailali & Kanchanpur district. This investigation program was conducted in sites of Kailali district, namely, Chure Rural Municipality and Lamki Chuha municipality. Active surveillance was done through questionnaire and serum feaces were taken from infected goats. A total of 61 households were interviewed and sampled, there were 2978 goats in that area. None of the goats were affected by Kumri (*Setaria sp.*).

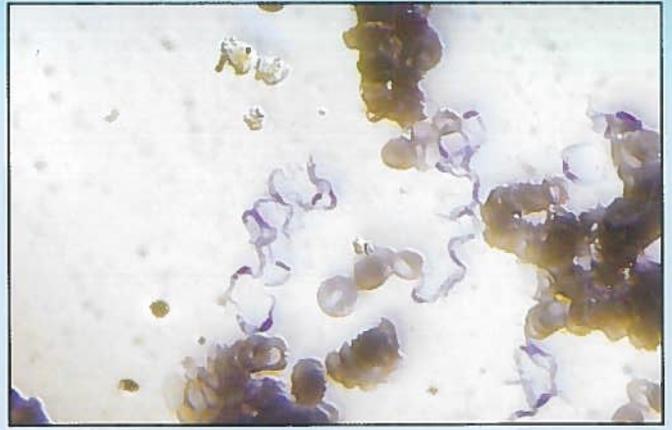
5. Regional Vaccine Bank

Table: Vaccine distribution as per national animal health program in Sudurpaschim Pradesh (F/Y 2077/78)

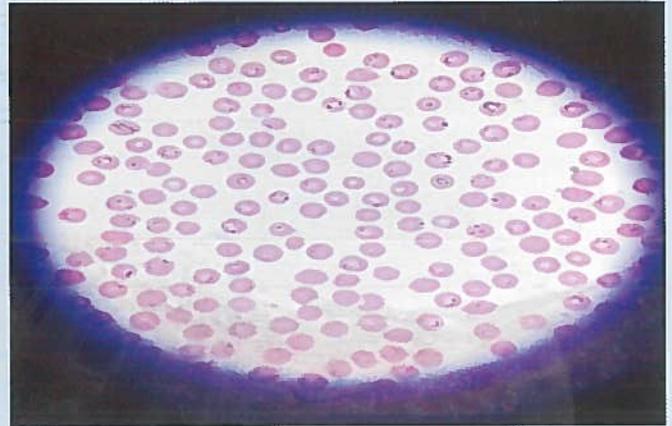
District	PPR	FMD	Anti-Rabies	ND I-2	H.S + B.Q	CSF
Darchula	44000	9000	600	10000		
Baitadi	80000	2550	700	20000		
Dadeldhura	94000	59000	500	20000		
Kanchanpur	93000	83950	700	20000	20000	10000
Bajhang	60000		260	15000	5000	
Bajura	55000		100	10000		
Doti	65000		250	25000		
Achham	66000		1520	25000		
Kailali	108500	154100	870	30000	20000	10000
Total	665500	349500	5500	175000	45000	20000



Blood collection from goat for PPR seromonitoring



Trypanosoma in blood smear



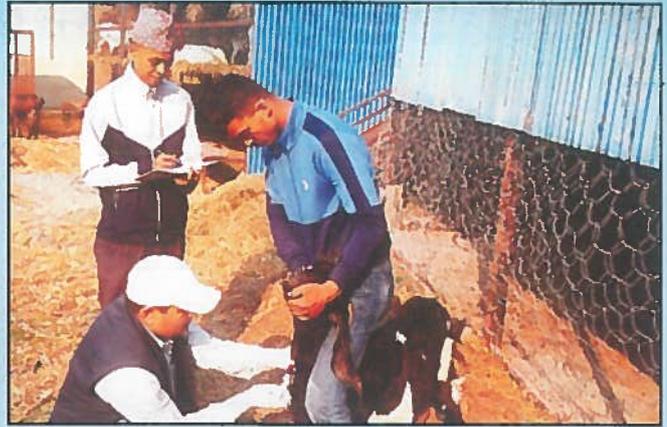
Babesia in blood smear



Meat shop inspection



Conducting postmortem examination



PPR seromonitoring sample collection



Testing for residues for Veterinary drugs



Molecular testing



DNA/RNA extraction for PCR



Bacteriological culture in microbiology lab



Meat sample collection for testing of residues of veterinary drugs



Interaction with veterinarians and technicians of province and local level