

**NATIONAL VETERINARY RESEARCH INSTITUTE (NVRI) VOM**



**2021 ANNUAL REPORT**

## OUR MANDATE

- A) Conduct research into all aspects of animal diseases, their treatment and control.
- B) Develop and produce animal vaccines, sera and biological to meet the national demand.
- C) Provide surveillance and diagnosis of animal diseases.
- D) To introduce exotic stock for improving egg, meat and milk production.
- E) Provide extension services and publications to poultry and livestock farmers.
- F) Train Intermediate manpower in Veterinary and Medical Laboratory Technology and Animal Health and Production Technology

## OUR MISSION

To conduct research, disease surveillance, diagnosis, development and production of vaccines and biological for the control of animal and zoonotic disease, applying modern technology based on international best practices.

## OUR VISION

To be the Apex Veterinary Research Institute in Africa driven by excellence in Research, Diagnosis, Vaccine Development and Production.

## OUR Core Values

**Excellence:** Products and services that meet international standard and customer satisfaction.

**Integrity:** Good conduct and character in service delivery

**Networking & Collaboration:** To establish good working relationships, sharing information and resources with Institutions and Organisations.

**Accountability:** Responsibility and Commitment.

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### Publications and Seminar Committee members

Dr. J Kamani	Chairman
Dr. NI Ogo	Member
Dr. SI Tekki	Member
Dr. AR Jambalang	Member
Dr. LD Pam	Member
Dr. LP Suleiman	Member
Dr. MB Bolajoko	Member
Dr. AJ Adedeji	Member
Mr. J Gotep	Member
Mrs. P Madu	Member
Mr. J Musa	Member
Dr. J Adole	Assistant Secretary
Dr. VI Ifende	Secretary

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## INSTITUTE MANAGEMENT COMMITTEE (IMC) 2021



**Dr Ocholi, R.A.**  
**Director BVP**



**Dr Nwosuh, C.**  
**Director TADs**



**Dr Odugbo, M.**  
**Director QA**



**Dr Chukwuedo, A. A**  
**Director Production**



**Mr Idoko, A.**  
**Director F&A**



**Dr Maryam M.**  
**Director/Chief Executive**



**Bar Bawul, J.L.**  
**Director HRM**



**Dr Yabubu, B.**  
**Director Biochem& DD**



**Dr Ogedengbe, M.E.**  
**Director Planning**



**Dr Ngulukun S.S.**  
**Director DS**



**Mrs Abiayi, E.**  
**Director SS**



**Mr Danboyi, A. W.**  
**Ag Head IA**



**Dr Dashe, Y.**  
**Ag. Director ES**



**Dr Kamani, J.**  
**Director LS**

NVRI EVENTS IN PICTURES



ECOWAS representatives on a courtesy visit to NVRI Vom



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Visit of FAO ETAD officers to NVRI Vom





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Visit of FAO and donation of laboratory consumable for Covid-19 diagnosis to NVRI Vom



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Visit of the International Committee of the Red Cross (ICRC) to NVRI Vom



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Participants, facilitators and dignitaries at an In-House training for staff of Accounts, Audit and Stores, NVRI Vom



LIDISKI Workshop facilitators and NVRI-IMC members

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Commissioning and handing and taking over of NVRI Lagos laboratory complex



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Visit of the Nigerian Army, Jos to NVRI Vom



Veterinary Council of Nigeria (VCN) on a courtesy visit to NVRI Vom

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Visit of NIPSS participants to NVRI Vom



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Visit of FCT Abuja & Plateau State COVID-19 Task Force to NVRI Vom



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Courtesy visit by the Commissioner of Agric, to NVRI Vom





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Visit of representatives of Dairy Development and milk stream Friesland Ltd to NVRI Vom



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NVRI extension and outreach to Kogom village, Jos South LGA Plateau state



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Visit of Sarkin Toro, Bauchi state to NVRI Vom



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WHO representatives on courtesy visit to NVRI Vom

# NVRI 2021 ANNUAL REPORT

## PREFACE

Adjusting to the 'new normal' in 2021 following the restrictions due to COVID-19, NVRI staff weathered the storms and braced up to fulfilling the mandate of the Institute. Consultations and lectures were held to prepare staff emotionally and psychologically to cope with the changing routines post COVID-19. It is heartwarming to note that research, diagnostic, production and extension activities of the Institute were fully conducted as presented in this document.

The Institute was actively engaged in research and surveillance activities on emerging and re-emerging zoonoses such as Monkey pox, Lassa fever, Dengue, Crimean- Congo Hemorrhagic Fever Virus (CCHFv), Zika virus etc. Preliminary data are being compiled.

NVRI has continued to render services as a COVID-19 testing laboratory. The Institute has collaborated with local and international partners in order to strengthen the research activities and to ensure sustainability. Furthermore, our staff have continued to provide assistance and support to students at various levels of training for research project samples analysis using our facilities.

Efforts are ongoing to obtain international registration and certification of some diagnostic laboratories in the institute. Requisite staff have been trained and International accreditation bodies have conducted assessment of our facilities for this purpose. Some of our laboratories will become ISO-17025 certified in 2022. This will further boost the image of the Institute and pave way for international trade in animal products by local farmers.

The Institute hosted several dignitaries during the year under review. Our doors are always open for collaborations as we invite individuals and organizations to visit and explore possible areas for collaboration. Read through this report, identify area(s) of interest and come so that we can build the Institute and Nigeria together.

I wish you happy reading.

Dr. Maryam Muhammad (DVM, MSc, PhD)

Director/Chief Executive

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## BACTERIOLOGY DIVISION

### INTRODUCTION

Bacterial Research Division of the National Veterinary Research Institute, Vom is made up of four sections namely, Brucella, Mycoplasma, Pasteurella and Salmonella research laboratories. Each of the sections /laboratory has the mandate of isolation, identification and characterization of bacteria and developing new techniques for the diagnosis and control of bacterial diseases of economic and public health importance. The division is also responsible for the production of biologicals for research and vaccine development.

### SPECIFIC NOTABLE ACTIVITIES

Various samples (organs, tissues, swabs, water, blood, serum, etc.) were received by the various sections from different animal species including cattle, sheep, goats, pigs, birds (domestic/wild), etc. The samples were processed and analyzed using different techniques for isolation, identification and characterization of bacterial pathogens. Results obtained from the different sections are summarized in tables 1 & 2.

Table 1: Summary of samples received and analyzed for bacteria pathogenic enteric-bacteria.

S/No	Source of sample	No. of samples	Results
1	poultry feed, dust, water, litter and faeces	34	Negative
2	Boot swab, faecal and dust samples	300	42 <i>Salmonella</i> isolates, 24 ESBL <i>Escherichia coli</i> , 113 normal commensal <i>Escherichia coli</i>
3	Faecal samples on dry whatman paper	6	Negative

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Table 2: Summary of samples received and analyzed for bacteria pathogens

S/No	Type of specimen	Animal species	No. collected	Results
1.	Sera	Bovine	646	251 positive
2.	Lung tissue		31	8 positive
3.	Nasal Swab	Bovine	181	3 positive
4.	Oropharyngeal swab	Avian	16	Nil

Routine serological diagnosis was carried out by RBPT on 223 serum samples consisting of 4 from human, 144 from cattle, 30 from horses, 7 from dogs, 19 from sheep, 11 from goats and 8 from pigs.

Similarly, seven milk samples from cattle were screened for *Brucella* species antibody using the milk ring test (MRT).

Furthermore, five out of 225 (2.2%) sera samples (111 ovine and 114 caprine) screened for *Brucella* antibody using RBPT as part of a PGD program were positive. Also, 5 out of 81 (6.2%) sheep sera and 3/50 (6.0%) cattle sera tested by the RBPT were *Brucella* species antibody positive. This was done as part of HND projects for 3 students from the FCAHPT, Vom.

During the period under review, four batches of coded (unknown clinical isolates) were received from the Antimicrobial Resistance (AMR) reference laboratory from EQuAfrica for identification as part of proficiency testing.

All the samples were analyzed accordingly and the results have been sent to the submitting laboratory accordingly.

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## CHALLENGES

- ✓ Inadequate freezers for storing large amount of sera
- ✓ Erratic power supply which affects some equipment
- ✓ No internet facility for research
- ✓ Non-functional equipment
- ✓ The section experienced some challenges such as lack of equipment and reagents for research
- ✓ Most of the equipment (-80°C freezer, biosafety cabinet, microscope, hot air oven and weighing balance) in the section are defective and need to be repaired
- ✓ There are limited number of fridges for proper storage of isolates, media and reagents.
- ✓ Inadequate laboratory equipment like autoclave, functional deep-freezers etc.
- ✓ Insufficient working space which results to unnecessary contamination
- ✓ Lack of antibiotics disc for antimicrobial susceptibility testing.
- ✓ Inadequate staff especially junior staff.
- ✓ **Lack of office accommodation for staff**
- ✓ Due to the renovation that was carried out in the Bacteriology Laboratory, there was no much work done.
- ✓ Installation of equipment in the new AMR laboratory yet to be done
- ✓ Some reagents are expired or unavailable (Horse serum, CBPP cELISA kit).

## FUTURE PLANS

- Isolation and identification of bacteria from different animal samples
- Antimicrobial susceptibility testing
- Antimicrobial resistance surveillance
- Laboratory routine diagnosis of livestock diseases
- Genotypic studies on the stored isolates



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## BACTERIAL VACCINE PRODUCTION DIVISION

### Function/mandate

The division continued in her primary responsibility of producing bacterial vaccines for prevention of livestock and poultry diseases of economic and/or public health importance in Nigeria and other West African countries.

In line with the above mandate, the division produced the under listed veterinary bacterial vaccines:

Contagious Bovine Pleuropneumonia Vaccine (CBPPV).

Blackquater Vaccine (BQV).

Hantavac Vaccine (HV).

Anthrax Spore Vaccine (ASV).

Haemorrhagic Septicaemia Vaccine (HSV).

Brucella Vaccine (BV).

Fowl Typhoid Vaccine (FTV).

Fowl Cholera Vaccine (FCV).

### Specific (notable) activities in the year 2021

The division produced nineteen million, eight thousand three hundred and sixty (**19,008,360**) of doses of the various bacterial vaccines to meet up with market demands. The details of vaccine production for the year are given in tables 1.

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**Table 1:** Monthly figure of doses of bacterial vaccines produced in the year 2021.

Month	ASV	BV	BQV	CBPP	FCV	FTV	HANTAVAC	HSV	TOTAL
January									
February	362,800			812,400		955,300	48920	51,280	2,230,700
March				1,163,100		437,900	44,320	63,400	1,708,720
April									
May								67,200	67,200
June	761,200	151,700	1,091,500	1,583,700	67,000	799,800		28,600	4,483,500
July	380,400		1,045,500	1,686,600					3,112,500
August	368,000	-	1,082,500	853,400	79,800	308,500	65,600	60,440	2,818,240
September	374,400	-	-	775,500				26,400	1,176,300
October	-	-	-	425,200	-	-	65,560	59,360	550,120
November	374,000		743,000	333,300	84,200		224,000	48,960	1,807,460
December	398,000			769,700			49,600	61,320	1,278,620
<b>TOTAL</b>	<b>3,018,800</b>	<b>151,700</b>	<b>3,962,500</b>	<b>8,402,900</b>	<b>231,000</b>	<b>2,501,500</b>	<b>273,000</b>	<b>466,960</b>	<b>19,008,360</b>

**KEY:** ASV-Anthrax spore vaccine; BV-Brucella vaccine; BQV-Black quarter vaccine; CBPPV-Contagious bovine pleuropneumonia vaccine; FCV-Fowl cholera vaccine; FTV-Fowl typhoid vaccine; HSV-Haemorrhagic septicaemia vaccine; HV-Hantavac vaccine

## Challenges

- Inadequate staff to effectively man the various vaccine production section in line with Good Laboratory Practice
- Shortage of water supply to the Division that always affect production of vaccine.
- Inadequate laboratories to carter for each type of vaccine production
- Lack of a user-friendly adjuvants for HSV and FCV production.
- All the production laboratories don't have Biosafety cabinets needed to reduce contamination of vaccines

## Future plans

- To conduct research of the production of freeze- dried anthrax spore vaccine (ASV). The pilot experiment conducted showed some promising results.
  - Conduct training of staff on modern vaccine production techniques in order improve on vaccine quality.

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## BIOCHEMISTRY DIVISION

### **Mandate:**

The Division is charged with the responsibility of conducting research into all aspects of veterinary diseases and animal nutrition, their treatment and control.

### **Specific activities:**

The Division carried out analysis of research and commercial feed, plant and serum samples.

### **Achievements:**

The Division carried out analysis of feed samples sent from Poultry Division.

The Division in collaboration with other staff within and outside NVRI was able to successfully host the maiden virtual NEF-NVRI Toxicology Internship program.

A research proposal was also drafted by research staff of the Division to examine the ameliorative potential of selected phytochemicals on coccidiosis infection in layer birds.

### **Challenges:**

The major challenge affecting the Division is dysfunctional equipment: Spectrophotometers, Amino acid analyzer, Atomic absorption spectrophotometer, High Performance Liquid Chromatography.

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**BIOTECHNOLOGY DIVISION:** Uses biology to solve problems.

## NVRI BIOTECHNOLOGY CENTRE

“Is a life science economic development organization that helps bring ideas to market”

### OBJECTIVES OF BIOTECHNOLOGY CENTRE

- Standardize, facilitate and apply series of high-quality biotechnology laboratory techniques for the essence of research and diagnosis.
- Coordinate and disseminate advances in biotechnology to meet environmental challenges.
- Conduct innovative research dedicated to investigating the complex interactions that define our environment.
- Committed to maximizing the benefits of biotechnology in research and diagnosis.

### MANDATE OF BIOTECHNOLOGY CENTRE

- Development and validation of biotechnology techniques for national use in diagnosis and research.
- Investigation of animal disease pathogens using molecular techniques.
- Development of biologicals for animal diseases control.
- Investigation into emerging and re-emerging zoonotic agents.
- Conducting trainings on biotechnology methodologies for diagnosis and research.
- Serve as Centre for biotechnology in collaboration with
  - ❖ International research institutions and Universities
  - ❖ DNA barcoding of animals, disease vectors and invasive pests
  - ❖ National Animal Genetics Resource (NAnGR)

Specific activities in the year 2021

1. PCR/Bioinformatics training  
PCR and Bioinformatics training was held in the division in 2021. The aim of this training was to train the staff and other staff members from other departments in the rudiments of PCR and introduction to Bioinformatics. The bioinformatics training was delivered by some members of staff and an additional resource person from Redeemers University, Ede, Osun State
2. Biotechnology division was formerly under the BDD directorate but in 2021, it was moved to be under the supervision of the Executive Director.
3. Project Presence of Avian Coronavirus in domestic birds
4. Detection and characterization of avian Hepatitis E virus in domestic and wild birds.  
Sampling for this project commenced in January 2021 and continued till October 2021. A total of 200 fecal samples were collected from wild birds in various locations in Plateau State and were stored at -80 °C awaiting reagents for processing.
- 5.

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## **Achievements in 2021.**

1. Establishment of a Bioinformatics club: Following the PCR training, a Bioinformatics club was formed comprising of 23 members. This will help to encourage the sharing of Bioinformatics knowledge among researchers.
2. Letter of commendation was given to two staff members of the Biotechnology division: Mrs Ebere Rosean Aguisi and Ms Nneka Chima for performing well during the rabies proficiency testing. The test was performed by the above-named biotechnology staff and the test scores 100%

## **Challenges**

The major challenge faced in 2021 is the lack of some requested equipment and funds.

The Biotechnology Division needs a sequencing platform to make the gene analyses easier.

There is a need for a Nanaodrop equipment to allow for measurement of DNA, RNA and protein.

There is need for more office space for staff of the division

Other challenges include:

Paucity of funds for sampling within the State and other States

Scarcity of reagents for ELISA and molecular detection.

Shortage of storage space in the -80 degrees freezers.

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## Research Highlights of 2021

**Table1: Research and diagnostic activities on samples submitted within NVRI**

Sample source	Disease/Pathogen	Number of samples	Submitting Division
Pigs	ASF	378	CDL+Biotech
Dogs	Rabies	23	CDL
sheep	PPR Virus	73	VRD/CDL
Dogs	Leptospira	36	CDL
livestocks	Salmonella	193	Bacteriology
livestocks	E.coli	37	Bacteriology
Birds	Campylobacter	13	Bacteriology
Human	Plasmodium	117	CDL
Brucella	Brucella	12	Bacteriology
Human	T.B	5	CDL
Total samples analyzed		<b>887</b>	

## SAMPLES SUBMITTED FROM OUTSIDE NVRI AND PROCESSED ON COMMERCIAL BASIS

DISEASE/PATHOGEN	SAMPLE SOURCE	TEST CONDUCTED	NUMBER OF SAMPLES	TYPE OF RESEARCH	CHARGES
Plasmodium	Human	PCR	25	PhD	50,000
Trypanosomiasis	Fish	PCR	34	PhD	50,000
Rift Valley Fever Virus	Mosquitoes	PCR	150	PhD	53,000
Echinococcus Granulosis	Cattles	PCR	50	PhD	50,000
Anaplasma	Cattles	PCR	50	PhD	50,000
Sarcocystics	Cattles	PCR	50	PhD	50,000
Black Flies	Flies	PCR	10	BSc	20,000
N/A	N/A	Use of equipment	N/A	N/A	4,300
CBPP	Cattles	PCR	5	MSc	22,500
Cryptosporidium	Pigs	PCR	5	MSc	136,000
Trypanosomiasis	Mice	Parasite purification	1	N/A	3,000
Human Papilloma Virus	Human	Electrophoresis	1 gel run	PhD	3,000
E.coli	N/A	Protein analysis by SDS-PAGE	7	PhD	25,000
N/A	N/A	Bench fee (undergraduate)	N/A	BSc	18,40
N/A	N/A	PCR	1		9,020
				<b>Total</b>	<b>525,820</b>

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## DAGWOM FARM

### INTRODUCTION

Dagwom Farm is a Division of the National Veterinary Research Institute, Vom. It comprises of the following sections: Feed Mill, Rabbitry, Store and Fabrication. The Division is charged with the following responsibilities;

- a. Production of standard quality livestock feeds to support vaccine production and research.
- b. Research and formulate appropriate livestock feeds for adequate performance.
- c. Production of Rabbits for replacement and extension to interested organizations, institutions and individuals.
- d. Investigation of common diseases of Rabbits to improve performance.
- e. Production of cheaper and affordable kerosene incubators with high efficiency.

### RABBITRY SECTION

#### Rabbits Production

S/N	Categories of rabbits	Opening Stock	Closing Stock	Production
1.	Does	34	42	
2.	Bucks	33	10	
3.	Growers	4	23	
4.	Weaners	-	13	
5.	Litters	17	95	339
6.	<b>TOTAL</b>	<b>88</b>	<b>183</b>	<b>339</b>

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## FEED PRODUCTION AND DISTRIBUTION

FEED TYPE	Divisions/institutions										TOTAL
	POULT	D/FAR M	DIA G	FCML T	BIOCHE M	RLAI & TAD	RL	QCD	VR	D/F TRIAL	
QLM	11.00										11.000
LM	21.750										21.750
GP	-	3.538	9.85		2.000	0.570	0.340	2.175			18.473
GM						0.920		0.050			0.970
CM	26.500										26.500
<b>TOTAL (TONS)</b>	<b>59.250</b>	<b>3.538</b>	<b>9.85</b>		<b>2.000</b>	<b>1.490</b>	<b>0.340</b>	<b>2.225</b>			<b>78.693</b>

### BROUGHT FORWARD FROM FOURTH QUARTER

SOYA BEANS CAKE	=	237kg
SOYA FULL FAT	=	104kg
CRUDE SOYA OIL	=	393 Litres

### SOYA BEANS PROCESSED IN THE YEAR

PERIOD	QTY OF SOYA BEANS RECEIVED (KG)	QTY OF SBC PROD (KG)	QTY OF FF PROD (KG)	QTY OF SBC USED (KG)	QTY OF FF USED (KG)	QTY OF OIL PROD (LITRES)	QTY OF OIL SOLD/SLUDGE/USED (LITRES)	AMOUNT (N)
JAN-DEC	24,884	18,233,375	3,291.375	17,055.0	3,123.625	1,417	923	230,750.00

### CARRY FORWARD FROM FOURTH QUARTER IN TO FIRST QUARTER

SOYA BEANS CAKE	=	1,070kg
SOYA FULL FAT	=	230kg
CRUDE SOYA OIL	=	114Litres
OIL SLUDGE	=	15kg



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## FABRICATION SECTION

### PRODUCTION/SALES OF KEROSENE POWERED INCUBATORS

	B/F	NO CONSTRUCTED	NO. CONSTRUCTION	UNDER	NO SOLD	TARGET	COST UNIT	PER	TOTAL
1 <sup>st</sup> Quarter	-	-	-		3	25	105,000.00		315,000.00
2 <sup>ND</sup> Quarter	-	3	-		-	25	-		-
3 <sup>RD</sup> Quarter	-	-	-		-	25	-		-
4 <sup>TH</sup> Quarter	-	3	-		3	25	105,000.00		315,000.00
<b>TOTAL</b>	-	<b>6</b>	-		<b>6</b>	<b>100</b>	-		<b>630,000.00</b>

## CHALLENGES

- Low productivity and intermittent breakdown of some oilseed processing unit machines (Extruder, Expeller and Auger) due to ageing.
- Lack of good storage facilities of feed materials/ingredients.
- Lack of a weigh bridge to determine actual quantity of raw materials (feedstuffs) received from suppliers.
- Lack of a stationed vehicle for feed mill operations.
- Lack of grains pre-cleaning machine.
- Lack of water supply to the feed mill for extruding and Pelleting of feed (bore hole)
- Lack of protective clothing like Lab coats, Overalls, Safety boots, head gears, nose masks, rain coats and rain boots for staff and visitors in the feed mill in line with Bio-safety requirements.
- In-sufficient tools and machines leads to poor result of set target, some of these machines includes Guillotine machine, folding machine, Rolling machine and wood work multi-purpose machine (3d machine).
- Most of our machines are obsolete.
- Delay in release of funds lead to the set back of our set target.
- Lack of adequate supply of water as and when due and require two 1,500 litres capacity overhead plastic tanks.
- Requirements for drugs, disinfectant and consumables.
- Purchase of more buckets and head pans.
- Lack of internet services in farm, this encourages staff movement.
- Constitution of Feed Stuff procurement committee to set standard for all incoming grains and premixes.
- Feed stuff was supplied in used sacks making storage condition impossible.
- Renovation of the store houses.
- Renovation of the old grains silo.

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## DIAGNOSTIC LABORATORY SERVICES DIVISION

### FUNCTIONS OF THE DIVISION

The functions of the Division include; disease diagnosis and surveillance, ambulatory services based on request, serve as a referral centre for the state veterinary services and the outstation laboratories as well as providing trainings in disease diagnosis to personnel from other agencies and laboratories.

### Routine diagnosis

In the bacteriology section of the microbiology laboratory assorted samples from chicken, cattle, dogs, sheep, goats, pigs, bats, fish, rabbits as well as feedstuff, water and vaccine media were processed and analyzed. The following microorganisms were isolated from the samples, *Streptococcus* sp, *Klebsiella aerogenes*, *Klebsiella* sp, *Escherichia coli*, *Staphylococcus aureus*, *Staphylococcus* sp, *Micrococcus* sp, *Salmonella* sp, *Salmonella* Gallinarum, *Salmonella* Pullorum, *Proteus morgani*, *Proteus retgerri*, *Shigella* sp, *Citrobacter* sp, *Citrobacter feundii*, *Bacillus circulans*, *Bacillus firmus*, *Bacillus licheniformis*, *Bacillus macerans*, *Aeromonas hydrophilia*, *Aeromonas* sp, *Enterobacter* sp, *Yersinia* sp, *Pseudomonas* sp, *Pasteurella* sp, *Aspergillus* sp, *Proteus vulgaris*, *Leptospira tarassovi*, *L. grippostyphosa*, and *L. australis*.

The clinical chemistry Section of the clinical pathology laboratory did not perform any diagnostic work this year due to lack of reagents for the auto-chemistry equipment. However, the haematology section received and analyzed some samples. The details are presented in Table 1.

Table 1: Samples received and analyzed in the Heamatology laboratory

S/N	Specie	Suitable	Not suitable	Total
1	Chicken- Avian	85	2	87
2	Cattle- Bovine	248	2	250
3	Dogs- Canine	10	1	11
4	Goats-Caprine	156	8	164
6	Human	2	0	2
7	Rabbits- Laprine	96	0	96
8	Sheep -Ovine	64	0	64
		<b>661</b>	<b>13</b>	<b>674</b>

## **NVRI 2021 ANNUAL REPORT**

In the Parasitology laboratory, a total of two brain samples, 173 blood and 677 fecal samples, were examined for various parasites

The Clinical Pathology Section analyzed 871 samples for various parameters. Hematological parameters were determined using manual methods.

### **Achievements**

The Division was able to improve on the turnaround time for the release of results based on the availability of consumables/reagents.

Provide training to students on industrial attachment and educational visits.

### **CHALLENGES**

Inadequate materials (reagents/media/consumables)

Faulty or nonfunctional equipment (auto-haemoanalyser & spectrophotometers)

Irregular and fluctuation in power

Non- calibration/servicing of some equipment (the auto-chemistry analyser)

Inadequate number of requisite staff

Inadequate office accommodation for staff members

### **FUTURE PLANS**

Explore and improve on source for Internally Generated Revenue (IGR)

Request for the procurement of polyvalent and some monovalent antisera for serotyping

Establishment of a mini molecular laboratory in the unit to enhance specific confirmation of some important bacterial and viral diseases.

Request for the procurement of with an auto-veterinary haemo-analyser to improve on IGR

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## EXPERIMENTAL ANIMAL MANAGEMENT DIVISION

### INTRODUCTION

The Division was established with the mandate of producing, managing and maintaining experimental animals for research activities in the institute.

### ACTIVITIES/ACHIEVEMENTS

During the period under review, the following research works were carried out in the Division by various researchers.

- Anti-*echis ocellatus* antibody from rabbits led by Dr. D. Ehizobolo
- The therapeutic evaluation of bioactive metabolite from medicinal plant extracted against experimental coccidia infection in broilers chicken. By Mr G. D. Sudan.
- Histological changes associated with the use of Africa mahogany aqueous stem bark extract in *Salmonella* induced broilers chicken by Dr. E.O. Anefu
- Reproductive parameters and blood profile of West Africa Dwarf buck fed *Moringa oleifera* leaf meal based diets by Mr. Udokaiyang A.D.
- Hantavac seed Antigen-Reactivation led by Dr. M. Sugun
- Growth performance of broiler chickens fed dietary level of *Centrosema pubscen* Meal. By O. Samuel
- Comparative studies of commercial feed on quail by A. Sajo
- Chronic obstructive pulmonary disease on rat (COPD) by O. A. Gbenga.
- Nine hundred and ninety - two albino mice and rats were produced and issued to various laboratories of the institute and other researchers.

### CHALLENGES/CONSTRAINTS

- There is urgent need for complete renovation of the experimental houses to meet up with the modern-day research work
- Lack lightning system on farm
- Lack of working tools such as rain boots, rain coats, shovel, hoes, clinical thermometer
- The division is need of lap-top and tablet for effective running of the divisional administrative work.

### FUTURE PLANS

- Renovation of existing experimental houses.
- Restocking of laboratory animals and introduction of new breeds
- Training of staff
- Building of new experimental houses for chickens, guinea pigs, quails, rabbits, rats, and mice.

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## FOOT AND MOUTH DISEASE LABORATORY DIVISION

### Mandate

To conduct research, undertake surveillance and diagnosis of economically important diseases of animals in Nigeria. To develop vaccine and biological (antiserum) with reference to African swine fever, Foot and mouth disease and African Horse Sickness.

### Diagnostic and Research Activities

During the period under review, a total of 32 epithelial tissues/vesicular fluids, 2773 sera samples from cattle, sheep and goats were received in the Division for analyses.

Out of the number of sera tested for 3ABC non-structural antibodies against Foot and mouth disease virus (FMDV), 750 sera were positive.

FMDV Serotypes O, A, SAT1 & 2 were detected using antigen detection ELISA.

The laboratory also participated in the 2020 World FMD Diagnostic Proficiency testing.

### ON-GOING PROJECTS

Currently, the laboratory is collaborating with the Canadian National Center for Foreign Animal Disease (NCFAD) on capacity building for the development of a diagnostic kit (In-house ELISA) as part of a National and Regional Foot and Mouth Disease Control Strategy (2019 –2022)

A study on the evaluation of the role of small ruminants in the spread and endemicity of Foot and Mouth Disease in Northern Nigeria. EUFMD funded.

The laboratory is participating in 2021 FMD Diagnostic Proficiency testing.

### CHALLENGES

The Division urgently needs the following equipment, reagents and materials to enable us cope with our research and diagnostic activities.

1. The division needs Fetal calf serum
2. The Division needs wash-up facilities.
3. The Division needs two more technicians and two more senior Vet. Research officers.
4. The division needs two biosafety cabinets.

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## HUMAN RESOURCES MANAGEMENT DIVISION

The Department is charged with the responsibility of general administration of the National Veterinary Research Institute. It oversees all administrative matters including advising, coordinating and supervising all the Departments and Units; this includes matters relating to staff appointments, promotion and discipline. Some of the Departmental activities comprise of maintenance of records, Training and Welfare of staff.

### FUNCTIONS OF THE DEPARTMENT

- i. Recruitment, Coordination of Appointment, Discipline, Resignation;
- ii. Preparation and updating of Nominal Roll.
- iii. Interpretation of government rules, regulations, policies and circulars.
- iv. Liaising with Federal Civil Service Commission, Office of the Head of Civil Service of the Federation and other Agencies on establishment matters;
- v. Staff Welfare matters e.g. loans and advances, Health, birth, death, marriage, pension;
- vi. Responsible for Management and maintenance of the Institute's security matters;
- vii. Serving as Secretaries of Committees of the Institute;
- viii. Coordinating training and development of staff.
- ix. Management of NVRI stores;
- x. Maintenance of the physical structures of the Institute; and
- xi. Maintenance of utility vehicles of the Institute.

### DIVISIONS IN THE DEPARTMENT

#### 1. Appointment, Promotion and Discipline;

The Appointment, Promotion and Discipline Division deals with the appointment, promotion and discipline of both Senior and Junior staff. It is headed by an Assistant Director

### ESTABLISHMENT SECTION

The Establishment Section is saddled with the responsibility of appointments, promotions and disciplinary cases for both senior and junior staff and is the custodian of staff records. It also coordinates general duties and activities in the Open and Secret Registries, liaises with the Records Section to update staff Nominal Roll and preparation of quarterly/annual reports. The Section interprets Government Circulars and regulations and assists in implementing the Institute's policies:

The Establishment Section is saddled with the responsibility of:

1. Appointments, Promotions, Disciplinary cases for both Junior and Senior Staff.
2. Handling of both Open and Secret Registries of Junior and Senior Staff
3. Preparation of Quarterly/Annual Reports for the Division.
4. Liaising with the Records Unit to update Staff Nominal Roll.

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5. Coordination of General Duties
6. Being the custodian of Staff records
7. Assist in Implementing Institute's Policies
8. Interpreting Government Circulars, extant Rules and Regulations

In the period under review (January – December, 2021), the Establishment Section of the Division handled the following:

1. Employment: No employment was done in the Institute during the period under review:

2. Promotions:

Senior staff	-	132
Junior staff	-	28

3. Advancement/Conversion:

Senior	-	16
Junior	-	5

4. Disciplinary cases:

Senior Staff	-	1
Junior staff	-	Nil

### CHALLENGES

1. There is lack of a computer system and its accessories to work with in the Section.
2. Lack of training and attending of seminars and workshops.
3. Lack of stationaries.

### RECORDS/DOCUMENTATION SECTION

The Records/Documentation Unit of the Institute is saddled with the following responsibilities:

- ❖ Maintaining Staff Records of Service
- ❖ Processing of Staff Leave
  - Maternity Leave
  - Annual Leave
  - Casual Leave
  - Examination Leave
  - Sick Leave
  - And other types of Leave as may be approved by the Director/Chief Executive.
- ❖ Compiling Documents for both Junior and Senior Staff's graded files.

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- ❖ Keeping records of both the Junior and Senior Staff on:
  - Appointments
  - Severance
  - Retirement
  - Deaths
  - Dismissal
  - Termination
  - Updating Staff Nominal Roll

In the period under review (January to December, 2021)

• Appointments	-	Nil
• Resignation	-	3
• Retirement	-	17
• Dismissal	-	1
• Termination	-	Nil
• Transfer of Service	-	2
• Deaths	-	7

### CHALLENGES

1. Lack of Desktop Computer and its accessories.
2. Lack of a printer, hard drive and Router.

### NATIONAL HEALTH INSURANCE SCHEME (NHIS) SECTION

The NHIS Section is saddled with the following responsibilities: -

- Providing health care for staff of the Institute and helping staff enrol, register, add dependents, add extra dependents and help change hospital providers of their choice within the NHIS Scheme.
- Keeping staff records of staff under the NHIS Scheme.
- Attending stakeholder meetings to keep abreast with updates and latest information.
- Obtaining enrollee list quarterly with updates
- Liaising with the HMO to help enrollees with their health care providers.

In the year 2021, the Section has been able to achieve the following:

• New Registration of staff members	-	12
• Change of Health care providers	-	25
• Addition of dependants	-	29
• Application for extra dependants	-	2
• Replacement of lost of ID cards	-	Nil
• Request for new ID cards	-	Nil
• Application for substitution	-	Nil
• Change of name	-	2



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- Application for change of name - 2
- Application for change of date of birth - Nil
- Application for transfer of child - 2
- Application for double registration - Nil
- Application for error in spelling names - Nil

### CHALLENGES

1. The Section needs a complete set of desktop computer with a printer, UPS and hard drive to help the Section function well, keep proper records of all enrollees on the Scheme.
2. There is the need for us to go for training to be in tune with the dictate of time.
3. There is lack of stationaries to work with like staplers, plain sheets etc.

### 2. STAFF WELFARE AND TRAINING DIVISION

The Staff Welfare and Training Division is saddled with the responsibility of welfare and training of senior and junior staff in the Institute. It is headed by an Assistant Director.

Sections under the Division are:

#### TRAINING SECTION

The Training Section in liaison with the standing committee on Training of the Institute Staff is saddled with the following responsibilities.

- i. Advising on training needs of staff.
- ii. Recommending staff for appropriate training in accordance with the Institute's training policy.
- iii. Processing of staff request for training.
- iv. Recommending appropriate refund of monies paid in respect of staff training on completion of course of study.
- v. Liaising with the records unit in keeping records of staff on training both locally and internationally and;
- vi. Handling any other issues relating to staff training.

In the year 2021, the unit processed the training of the following number of staff.

PhD	-	10
MSc	-	7
HND	-	4
ND	-	5
Trade Test	-	1
<b>Total</b>	-	<b>27</b>

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### **CHALLENGES:**

1. Lack of a Desktop Computer and its accessories.
2. Lack of a printer, hard drive and stationaries.

### **PENSION SECTION**

The Pension Section was established to handle the following functions:

- a. To handle all matters relating to the Defined Pension (Old Pension) scheme and, of recently in June, 2016 the Contributory Pension Scheme.
- b. To process deceased Employees' Group Life Insurance Benefits and Burial Assistances to their NOKs.
- c. To maintain and update the Pension Nominal Rolls of both Old & New schemes.
- d. To issue Letters of Introduction to retired staff in order for them to access their National Housing Fund Contributions domiciled with the Federal Mortgage Bank of Nigeria.
- e. To handle requests by Pension Fund Administrators as regards Interaction Forum/Sessions with staff of the Institute.
- f. To handle and process issues of Repatriation Benefits of retired Staff.
- g. To handle all other Pension related matters and correspondences.

### **SUMMARY OF MAJOR ACTIVITIES OF THE PENSION SECTION FOR THE YEAR UNDER REVIEW**

The Section received a request from the National Pension Commission (PenCom), Abuja which submitted to forward the details of two (2) staff of the Institute not below the rank of Assistant Director to serve as Administrators of the newly developed Enrolment Application to facilitate the upload of prospective retirees' information on the module of the Enrolment Application.

The Institute's Pension Desk Officers were invited by the National Pension Commission for a Workshop on the newly developed Enrolment Application which was graciously approved by the Director/Chief Executive. The Workshop was held at Ilorin, Kwara State from 16<sup>th</sup> – 19<sup>th</sup> June, 2021.

On 11<sup>th</sup> August, 2021, Mr. Gyang Dachung Davou (Assistant Chief Programme Analyst) from the Finance & Accounts Department was appointed by the Director/Chief Executive as Automation Desk Officer (Pension) to liaise with the Pension Desk Officers in the Human Resources Management Department due to the newly developed Enrolment Application which is web based.

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The Section successfully enrolled 17 retirees of the Institute online in the PenCom portal of the newly developed Enrolment Application.

The Section issued to the 17 retirees letters of Pre-retirement and Retirement from Service accordingly with their Repatriation Allowance and National Housing Fund contributions refund, processed.

The Section processed the payment of Seven (7) deceased staff Burial Assistance and also issued Letters of Introduction to their Next of Kins to obtain Letters of Administration to enable them process the Death Benefits of deceased staff and also issued to them Letters of Introduction to the deceased staff's Pension Fund Administrator (PFA).

The Section followed-up with the Institute's Insurance Brokers and the Office of the Head of Civil Service of the Federation on matters related to Group Life benefits of deceased staff.

During the year under review, a new Insurance Broker (Bondwell Insurance) was appointed for the Institute to cover between November, 2021 to May, 2022.

### **CHALLENGES**

The Section faced some challenges as follows:

- a. Delay in payment of the Statutory Burial Assistance of deceased staff, Repatriation Allowance of retired staff and Group Life benefits of deceased staff by both the Office of the Head of Civil Service of the Federation and Insurance Brokers which has led to the persistent complaints from both retired and deceased staff Next of Kins.
- b. Delay in processing and submission of documents by Next of Kins for the processing of Group Life benefits which usually delay the processing of benefits.
- c. Non – response to some correspondences of the Institute by some regulatory Agencies i.e. PenCom and PTAD, Abuja on pension related matters

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## **SIWES SECTION**

### **NYSC CORP MEMBERS**

One of the cardinal activities of the NYSC/SIWES and Educational Visit is to ensure that Youth Corps Members deployed to the Institute are either accepted/rejected. From January – December, 2021, the National Youth Service Corp Secretariat deployed a total number of Twenty (21) Batch 'A' Corp members in various specialization relevant to the need of the Institute which were posted to various Departments/Divisions of the Institute for their primary assignment.

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## STUDENTS INDUSTRIAL WORK EXPERIENCE SCHEME

The scheme is a skill acquisition exercise carefully designed to prepare students of Universities, Polytechnics/Monotechnics and Colleges of Education for transmission from school to work environment.

The following is the detail of schools that participated during the year under review. \*

S/No.	Name of Institutions	No. of Students
1.	University of Jos	24
2.	University of Micar, Gboko	11
3.	Plateau State University, Bokokos	8
4.	University of Maiduguri, Borno State	3
5.	Abubakar Tafawa Balewa University, Bauchi	8
6.	Federal University, Lafia	8
7.	Nnamdi Azikiwe University, Enugu	1
8.	University of Wukari	4
9.	Modibo Adamawa University, Yola	6
10.	Federal University, Kashere	7
11.	Bowen University	1
12.	Federal University, Dutse	1
13.	Kwarafa University	1
14.	Salem University, Lokoja	1
15.	University of Umudike	1
16.	Icon University	1
	<b>COLLEGES /POLYTECHNICS</b>	
17.	College of Education, Gindiri	3
18.	Federal College of Animal Health and Production Technology, Vom	20
19.	Plateau State Polytechnic, Barkin Ladi	5
20.	Nuda Polytechnic, Zaria	4
	<b>SECONDARY SCHOOLS</b>	
21.	Government Technical College, Bukuru	4
	<b>EDUCATIONAL VISITS</b>	
22.	Tertiary Institution	16
	Secondary Schools	35
	Primary Schools	4

### CHALLENGES:

1. Lack of Desktop Computer and printer.

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## SECURITY SECTION

I forward herewith annual report on the activities, progress and constrains of this unit for the year 2021 and a future plan for 2022 for your further necessary action.

This Section is a security services providers charged with the responsibility of providing protection of lives and properties for the purpose of achieving smooth administration and send research activities of this reputable establishment in the 2021. The need or intelligent gathering was paramount to the Unit, considering the security challenges faced in Plateau State and the Country at large in the period of under review, and the fact that we are operating in a complex society with people drawn from various discipline and background which requires a lot of tasks. So as to normalised and integrate diverge interest for good governance. It is this direction that the unit was purposed driven to the collection, collation, interpretation and processing of all information of value to the management in order to assist in the day to day administration of institute and the Colleges with physical and routine patrols security. Activities of students of the two colleges, staff schools, the general publics, and contractors as well as visitors to the institute were adequately covered. The result of which impressive intelligent value were gathered, analysed and forwarded to management. Also during the period under review other duties performed by the security unit includes the following.

**Physical protective duties:** During the year 2021 physical security protective duties was provide and achieved throughout the entire Institute. Guards were deployed to vulnerable areas. These beats were covered adequately on 24 hours' year around the guards were closely supervised by duty supervisors which help tremendously in checking those maintaining the beats.

**Foot/Mobile Surveillance:** In order to ensure the safety of lives and properties of staff and their families. The security embarks on a holistic foot/vehicular patrol activities of the institute aimed at checking activities of intruders as well as provide access control over legitimate insiders.

**Coverage of student's activities:** During the period under review the Institute just like any other social system was not crime free, cases such as theft, fighting s/w students and kidnapping and minor incidence recorded were properly investigated with good results.

**Conclusion:** Crime in 2021 was reduced to the barest minimum. This could be attributed to the efforts of the director who promptly responded to all security issues. The efforts of the security managers and operatives too greatly enhanced productivity. Prompt payment of salaries and promotion of staff also boosted the morals of staff of the serve and contributed to the successes so recorded.

## 3. GENERAL SERVICES DIVISION

There are three Sections in this Division:

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## i. WORKSHOP SECTION:

The Workshop Section as old as the Institute is charged with the responsibility of works on staff quarters, plants and equipment, plumbing, mechanical, electrical, generating machines etc. The Division also provides transport facilities and handles of vehicle mainetemance.

The Division has Ten (10) sections namely, Plumbing, Carpentry, Masonry, Painting, Electrical, Welding, Plant Maintenance, Mechanical, Drivers, and Environmental Maintenance sections.

The above sections extend their services to all parts of the Institute including the out-stations.

In the year 2021, the COVID 19 pandemic hindered most of the jobs the Division uses to carry out in previous years because only few staff were allowed to perform essential duties in sensitive sections of the Division which include Electrical, Carpentry, Plumbing, Plant maintenance, Transport and Environmental maintenance sections.

From our records the following jobs were carried by other sections of the Divisions which cuts across residential and official areas

1. Electrical	Section,	132 Jobs,
2. Plumbing	“	103 “
3. Painting	“	18 “
4. Carpentry	“	28 “
5. Welding	“	8 “
6. Masonry	“	12 “
<b>Total</b>		<b>= 303 Jobs</b>

Some sections which were not included in the essential duty list were called to perform duties when the need arises that is why we had masonry, painting and welding sections included in the above list of jobs performed by the Workshop Division. The plant maintenance staffs were fully on their duties of operating generators and the Boiler for vaccine production purposes.

In conclusion, lack of office and inadequate manpower in some of the sections were some of the challenges faced by the Division.

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## ii. STORES SECTION

### INTRODUCTION

The Stores Division as always leaving up to her mandate of ensuring an uninterrupted flow of working materials to the production and services departments of the Institute thereby contributing to the attainment of the Institute's objectives.

The Central Store is made up of Drugs, Chemicals & Reagents, Glass Wares, Expendable and Non-Expendable and Consumable, Vaccine Despatch, and Receiving Stores Sections. Others are Workshop and Maintenance, Dagwom Farm, LID, Furniture, Ledger and Scrap Stores Units.

Presently, we have 12 Senior Staff and 2 Casual Labourer in the Store Division.

### MAIN STORES

The main stores unit comprises of the following classification: Expendables, Non-Expendables, Consumables, Glass-wares, Drugs, Chemicals and Reagents.

During the year under review, the unit carried out the following tasks: -

- (a) The main stores maintain, keeps and receives all incoming expendables, Non-Expendables, Consumables, Glass-wares, Drugs, Chemicals and Reagents supplies of the Institute and releases same for use by all the producing, Research, services Units, Divisions and Departments.
- (b) The main stores ensure the proper documentation of all materials records and their physical correctness.
- (c) The unit under took the continuous reconciliation of the record of all stockable items in shelves, Bin cards, Fridges, Cupboards, Bulk stores, warehouse, containers and cool room.
- (d) It ensures that all Expendable, Non- Expendables, Consumables, Glass-wares, Drugs, Chemical and Reagents released are back up by approved stores transferred vouchers (STR)
- (e) It ensures posting of receipts, issues and costing of material using (FIFO) and material valuation.



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The main store has a stock in hand worth **₦1,179,066,690.19** as at December, 2021.

S/N	DESCRIPTION OF CATEGORY	SUB – TOTAL	TOTAL
1	<b>VETERINARY STORES (EE):</b> A. DRUGS, CHEMICALS & REAG. B. VACCINES	88,695,117.73 48,664,150.00	137,299,327.73
2	<b>STATIONERY(I):</b> A. STATIONERY B. CONSUMABLES	7,341,945.41 47,111,865.00	54,453,810.41
3	<b>LABORATORY EQUIPMENT STORE (GG):</b> - EXPENDABLES	-	363,266,354.93
4	<b>OTHER STOCK (II):</b> - NON-EXPENDABLES	-	39,673,355.94
5	GLASSWARE/APPARATUS STORE (FF):	-	450,403,760.18
6	FUEL & LUBRICANTS (E):	-	10,868,180.00
7	BUILDING MATERIALS (K):	-	1,282,500.00
8	ELECTRICAL MATERIALS(U):	-	26,498,980.00
9	<b>INDUSTRIAL &amp; CHEMICAL STORE ©:</b> A. PLUMBING MATERIALS		5,361,150.00
10	<b>ANIMAL FEED STORE (DD):</b> A. FEEDS		14,040,151.00
11	<b>FARM STORE (G):</b> A. LIVESTOCK B. BIRDS	21,130,000.00 4,479,120.00	25,509,120.00
12	<b>PLANT &amp; EQUIPMENT (BB):</b> A. VEHICLES B. REFRIGERATOR	50,245,000.00 165,000.00	50,410,000.00
	<b>TOTAL</b>		<b>1,179,066,690.19</b>

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## VACCINE DESPATCH UNIT

DESCRIPTION OF VACCINE	BALANCE B/F		RECEIPTS		ISSUES		BALANCE C/F	
	VIALS/ BOTTLES	DOSES	VIALS/ BOTTLES	DOSES	VIALS/ BOTTLES	DOSES	VIALS/ BOTTLES	DOSES
PPR – 50	49,447	2,472,350	47,519	2,375,950	85,341	4,267,050	11,625	581,250
ARVD – 1	9,993	9,993	23,195	23,195	28,538	28,538	4,650	4,650
NDVI/O – 200	-	-	11,966	2,393,200	4,590	918,000	7,376	1,475,200
NDV ½ -50	-	-	115,505	5,775,250	115,177	5,758,850	328	16,400
NDV ½ 200	7,531	1,506,200	972	194,400	8,503	1,700,600	-	-
NDVL – 200	14,350	2,870,000	53,973	10,794,600	64,241	13,448,200	1,082	216,400
NDVL – 500	-	-	3,818	1,909,000	2,525	1,262,500	1,293	646,500
NDVK – 200	4,873	974,600	23,269	4,653,800	18,208	3,609,600	10,094	2,018,800
NDVK – 500	-	-	2,770	1,385,000	2,434	1,317,000	336	168,000
FPV – 200	15,047	3,009,400	8,475	1,695,000	8,970	1,794,000	14,552	2,910,400
FPV – 500	-	-	366	183,000	197	98,500	169	84,500
IBDV – 200	19,705	3,941,000	13,198	2,639,600	28,518	5,703,600	4,385	577,000
IBDV – 500	-	-	-	-	-	-	-	-
LSD -500	770	38,500	105	5,250	248	12,400	627	31,350
FTV – 100	-	-	34,318	3,431,800	34,289	3,428,900	29	2,900
BSV – 200	3,203	320,300	1,658	165,800	492	49,200	4,369	436,900
CBPPV – 100	-	-	74,890	7,489,000	69,933	6,993,300	4,957	495,700
FCV – 200	129	25,800	1,201	240,200	977	195,400	353	70,600
HSV – 40	-	-	12,563	494,520	10,788	431,520	1,575	63,000
HANTAVAC -40	-	-	5,581	223,240	5,098	203,920	483	19,320
BQV – 500	-	-	7,931	3,965,500	6,948	3,474,000	983	491,500
ASV – 400	1	400	7,415	2,966,000	6,639	2,655,600	777	310,800

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## RECEIVING UNIT

The receiving section is charged with the responsibility of taking Delivery, Sorting, Inspection and Processing for payments, all consignments receive from suppliers and process deliveries and transferred to the respective stores for onward Documentation, Storage and Issue. During the period under consideration, stock worth a total of **N1,256,936,280** was received from Suppliers. The table below shows the items received and amount expended thus:

S/N	DESCRIPTION	1 <sup>ST</sup> QUARTER (₦)	2 <sup>ND</sup> QUARTER (₦)	3 <sup>RD</sup> QUARTER (₦)	4 <sup>TH</sup> QUARTER (₦)	TOTAL (₦)
1.	Diesel	28,320,000	15,788.800	25,845,000.00	29,232,500.00	<b>99,186,300.00</b>
2.	Feeds, Grains & Concentrates	27,207,120.00	40,265,747.02	26,310,470.00	53,728,678.02	<b>147,512,015.04</b>
3.	Laboratory Chemicals, Drugs & Reagents	2,061,182.72	-	6,094,826.27	166,644,453.97	<b>174,800,462.96</b>
4.	Office Equipment/ Stationery	19,851,785.07	11,781,214.28	9,996,814	30,746,948	<b>72,376,761.98</b>
5.	Laboratory Consumable	149,746,357.35	-	16,328,366.28	442,766,433.41	<b>608,841,157.04</b>
6..	Laboratory Equipment	-	2,463,825	-	42,217,354	<b>44,681,179.00</b>
7..	Plumbing Equipment	-	-	-	-	-
8.	Environmental unit	175,000.00	-	2,421,116.75	-	<b>2,596,116.75</b>
9.	Generator	-	-	-	-	-
10.	Vehicle/Truck	-	-	39,849,000.00	50,150,000.00	<b>89,999,000.00</b>
11.	Workshop	1,746,150.00	5,583,412.05	111,000.00	2,438,100.00	<b>9,878,662.05</b>
12.	Printing Press	-	-	-	-	-
13	Fertilizer & farm chemicals	-	4,367,325.00	202,500.00	2,494,800.00	<b>7,064,625.00</b>
	<b>Total</b>	<b>229,107,595.7</b>	<b>₦80,250,323.98</b>	<b>₦127,159,093.03</b>	<b>₦820,419,267.58</b>	<b>₦1,256,936,280.</b>

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## WORKSHOP/MAINTENANCE UNIT (DIESEL)

### DIESEL SUMMARY

DETAILS	NUMBER OF LITRES	
Balance B/F	12,260	
Supplies	283,000	
Adjustments	9,660	
Total available	304,920	
Less Total Issue	280,500	
Closing Bal.	24,420	
DETAILS	QTY IN LITRES	VALUES (N)
Generator Workshop	211,280	77,498,630.00
Diagnostic Furnace	6000	2,000,800.00
Poultry	29,500	10,422,850.00
Bacterial Boiler	13,920	5,196,600.00
Dagwom Farm	8,380	3,097,800.00
Water Tank	3,500	1,271,530.00
LID	3,500	2,656,060.00
VIP	880	331,100.00
<b>TOTAL</b>	<b>280500</b>	<b>102,475,370.00</b>

### LEDGER/DOCUMENTATION UNIT

The Ledger/Documentation comprises of the following sub-units; Ledger, Plants, Security Document.

During the year under review, the unit carried out the following tasks:

- The Ledger received all incoming store receives (SRV) vouchers (SIV) and store issue vouchers for non-expendables, consumables, Glass-wares; Drugs, Chemicals and Reagents, Plants, Furniture and its Documentation.
- The Ledger ensures the proper documentations such as posting and filing of these documents for future references.
- It ensures posting of receipts, issues and costing of materials.
- The Ledger keeps receipts and other security documents for the Institute; these are issued to Accounts and other Departments. These official receipts are issued base on approved applications or requirements (STR).

### CONSTRAINTS

- Lack of renovation of the Stores house to make room for improved ventilation/storage space
- The Stores house is chocked up with outdated or obsolete materials/items i.e. Expendables, Non- Expendables, Consumables, Glassware

## **NVRI 2021 ANNUAL REPORT**

- The Store house is also chocked up with slow moving items and some expired Drugs, Chemicals and Reagents.

### **REQUIREMENTS**

- Procurement of a heavy duty fork lift for offloading and movement of materials
- procurement of a hand fork lift and trolley for issuing of materials within the store house
- procurement of consumable items for daily maintenances of the Division/Department
- Employment of senior staff and junior for assistances.

### **OVER-ALL ACHIEVEMENTS**

During the year under review, we were able to achieve the following:

- We grouped some items according to their classes.
- We fostered relationship among ourselves and with other departments of the Institute.
- We reconciled Physical items with the Bin Cards and Ledgers.
- Weekly, monthly and quarterly records are reliable
- Cleanliness of the store houses is maintained.
- Continuous and timely production of vaccines reports.
- The role weekly report played is seen in the production.
- The market also played a role as seen in the releases and stock balance.
- Effective documentation of all receipts and issues
- All the offices and laboratories have inventory cards hung on the walls.
- Few sections in the stores Division has been upgraded to I.T compliance
- Diesel surface tank has been re-enforced against rainy season.

### **CHALLENGES/CONSTRAINTS**

- Despite the formation of Procurement Committee, decentralize purchases is still being witnessed. This procedure makes documentation difficult.
- Lack of renovation of the Stores house has made ventilation/storage space difficult.
- The Stores house is chocked up with outdated or obsolete materials/items (Expendables, Consumables and Glassware).
- The Store house is also chocked up with slow moving items and some expired Drugs, Chemicals and Reagent.
- The Vaccine cold room needs constant maintenance.
- Lack of protective clothing.
- Lack of bulk purchase of stocks hinders activity in the Institute.
- Lack of senior staff and Junior (store).

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## WAY FORWARD

1. Need for store staff to be trained in the use of store software and other FGN ICT compliance.
2. Need for the purchase of store handling equipment.
3. The Stores houses are in dilapidated condition and calls for urgent rehabilitation of the store houses and Offices for Job performance.
4. A regular maintenance of cold room machines.
5. To carry out yearly inventory in the Institute.
6. Coding of all Institute assets should be undertaken.

## 2021 WORK PLAN

- Encourage staff development through training and retraining, seminars and workshop between January and December, 2021.

### iii. ENVIRONMENTAL SECTION

The Environmental Section is responsible for landscaping of the Institute's environment as well as daily cleaning of the entire environment including Offices/Laboratories.

## UNITS UNDER THE DIRECTOR/CHIEF EXECUTIVE:

### i. SPECIAL SERVICES:

The Special Services Unit is headed by a Director who is answerable to the Director/Chief Executive. The main function is usually directed by the Director/Chief Executive on special assignments in nature including Servicom mentoring.

### ii. PROTOCOL UNIT

The Press and Protocol Unit of the Institute is saddled with the responsibility of giving a positive outlook and good image of the organization to government and private agencies, individuals and corporate bodies across the country and beyond. It coordinates the positive image of the Institute through liaising with the media, both print, electronic and online, within and outside the state. The unit also arranges for periodic interviews and interaction between the Director/Chief Executive and media organizations. It also sees to the day to day running of the establishment, caters for the general wellbeing of Institute's visitors/guests by providing accurate information, hospitality and welfare.

### Functions of the Unit include:

- To uphold the positive image of the Institute through liaising with the media, both print and electronic within and outside the state.
- Arrange for periodic interviews and interaction between the Director/Chief Executive and media organizations

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- Assisting in coordinating conferences, seminars and other official programmes in the Institute.
- Coordinating the D/CEs office activities including meetings and conferences.
- Receiving and general welfare of Institute's Governing Board members.
- Arrange for tour of Institute's facilities during courtesy calls or visits by very important personalities of the Institute.
- Receiving and Accommodating visitors as the case may be.
- Arrange for Transportation of guest(s) and other important personalities from international and reputable organizations.
- Coordinating meetings between Management and Staff of the Institute.

### Activities in 2021

With the partial easing of the COVID-19 restrictions nationwide, the D/CE received quite a number of visitors starting from January and eventually throughout the year.

- ✓ Courtesy visit by Miyetti Allah Cattle Breeders Association, Toro LGA of Bauchi State, Fire Service Command, Plateau State and Nigeria Union of Pensioners, North Central Zone on Friday 15<sup>th</sup> January, 2021.
- ✓ Food and Agriculture Organization FAO inspected and handed over donated items to the Institute on 18<sup>th</sup> January, 2021.
- ✓ Visit by the FCT Abuja/Plateau task force on COVID-19 to NVRI on 26<sup>th</sup> January, 2021
- ✓ Visit by the Senior Executive Course SEC No. 43/2021 of NIPSS Kuru on 25<sup>th</sup> February, 2021.
- ✓ Visit by Mr Jereon Elfers, the Corporate Director Dairy Development and Milk Streams, Friesland Campina (WAMCO) The Netherlands on 25<sup>th</sup> March, 2021.
- ✓ Visit by the ECOWAS Commission/Development of a partnership between COMATAO/RAHC and NVRI on 12<sup>th</sup> April, 2021.
- ✓ Visit by the International Red Cross Abuja while on a two-day mission on 6<sup>th</sup> July, 2021.
- ✓ Visit by the MD Grand Cereals Oil and Mills Mr. Alexander Goma on 8<sup>th</sup> September, 2021.
- ✓ Monitoring of capital projects in the Agriculture sector by the Federal Ministry of Finance and National Planning in the Institute on 8<sup>th</sup> July, 2021.
- ✓ Courtesy visit by the Foreign Commonwealth and Development Office of the United Kingdom on Tuesday 28<sup>th</sup> September, 2021.
- ✓ Visit of a delegation from Nasarawa State University on 29<sup>th</sup> September, 2021.
- ✓ ISO/IEC Awareness and Implementation training from 18<sup>th</sup> - 23<sup>rd</sup> October, 2021.
- ✓ Visit by a delegation from the Jampul Group on the 24<sup>th</sup> to 26<sup>th</sup> November, 2021.

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## Achievements

- ✓ The good image of the Institute was portrayed and maintained through adequate use of selected media organizations.
- ✓ Visitors were properly accommodated and treated well as arranged.
- ✓ There existed a Cordial relationship and understanding between the Director/Chief Executive, Press and Protocol Staff and Guests.
- ✓ Items needed for official duties were made available and used accordingly (A new digital camera and other accessories were purchased for the audio visual section).
- ✓ Facilities to enable zoom meetings by the D/CE were also acquired and installed.
- ✓ A good working relationship was maintained overall in the D/CEs office.

## Challenges

There is dire need for more staff to be posted to the unit especially concerning the protocol aspect.

- Not too effective use of the media to further portray the potentials of NVRI, Vom to the generality of Nigerians.
- Inadequate information and sometimes short notice to the unit about upcoming events which often lead to haphazard preparations.
- There is the need for training and retraining of Press and Protocol Officers to meet up with the current trends and for improvement and effectiveness at the job.

## Future Plans

- To organize short courses and trainings for Press and Protocol Officers from the Institute in conjunction with relevant organizations (NIPR, Jos Business School, ASCON Badagry) and other Organizations in order to rub minds together, share ideas and bring out the way forward for the unit.
- To continually help in maintaining a good image of the Institute.
- To arrange for periodic interactive sessions to discuss issues, challenges for the progress of the Unit and the Institute at large.

## iii. SERVICOM UNIT

Servicom is an acronym for Service Compact with all Nigerians which was established in 2004. A commitment to improving service delivery for citizens with support at the highest level of government and also an engine for the service delivery programme.

### Functions:

- To coordinate the formulation and operation of Servicom Charters.
- Service improvement plans in MDAs.
- Monitor and report progress and performance of MDAs under Servicom obligations through compliance.
- Evaluation using the Servicom index.



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## iv. LEGAL SERVICES

The Unit serves as adviser to the Institute on all legal matters. It also draft legal documents and handle both criminal and civil cases of the Institute in liaison with External Solicitors and the Legal Department of the Federal Ministry of Agriculture and Rural Development. The Institute had handled about five (5) cases in 2021 which are at various stages.

S/NO	PARTIES	SUIT NO	CURREN STATUS/ BRIEF OF THE CASE	COURT	LAWYER HANDLING	REMARKS
1.	i. National Veterinary Research Institute, Vom  ii. Dr. (Mrs) L.H. Lombin  and Dr. Samuel O. Ogunjumo	CA/J/291/2018	case was instituted at the Federal High Court Jos in 2009 and later transferred to National Industrial Court Jos, due to the 3 <sup>rd</sup> alteration of the 1999 Constitution .Judgment was delivered on 31/3/2017 in favour of Dr. S.O. Ogunjumo.In order to enforce the Judgement, the Institute was served with FORM 48 (which is Order IX Rule 13 of the Judgement Enforcement Rules) and Writ of Attachment and Sale of Goods where seven(7) Institute’s vehicles were attached/seized and taken to National Industrial Court while four (4) vehicles were sealed and left in the Institute. The Institute had entered an appeal against the Judgment obtained.	Court of Appeal, Jos Division	G. S. Pwul, SAN & Partners. Barristers and Solicitors of the Supreme Court of Nigeria (Shamtu Memorial Chambers) Trust White House, 34, West of Mines, Jos.	Waiting for a Hearing Notice from the Court.

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			The matter is set for hearing at the next adjourned date of 22 <sup>nd</sup> September, 2022.			
2.	<p>i. National Veterinary Research Institute, Vom</p> <p>ii. Governing Board, NVRI, Vom</p> <p>And</p> <p>Mr. Reuben Awanye Itruma</p>	CA/J/276/2018	<p>The case was instituted by Mr. Reuben Awanye Itruma (who was dismissed from the service of NVRI, Vom due to absenteeism and Gross misconduct) at the Federal High Court Jos in 2009 and later transferred to National Industrial Court Jos, due to the 3<sup>rd</sup> alteration of the 1999 Constitution. Judgement was delivered on the 22/06/2017 in favour of Mr. Reuben Itruma. In order to enforce the Judgement, the Institute was served with FORM 48 (which is Order IX Rule 13 of the Judgement Enforcement Rules) and Writ of Attachment and Sale of Goods where seven (7) institute's vehicles were attached/seized and taken to National Industrial Court, Jos while four (4) vehicles were sealed and left in the Institute. The Institute had</p>			Waiting for Hearing Notice from Court of Appeal.

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			<p>equally entered an appeal against the Judgement. Records had been compiled and transmitted to the Court of Appeal. On the 1<sup>st</sup> March, 2022, the Respondent counsel brought an application praying the court for extension of time to file in their Respondent Brief. The court granted the application and ordered that the Respondent counsel pay the penalty fee for late filing (from 2018-1<sup>st</sup> March, 2022) The case was then adjourned to 4<sup>th</sup> May, 2022 for hearing. The court did not sit on the said date. Waiting for a Hearing Notice to be served on the Institute for a new date.</p>			
3.	<p>Malam Muhammed Nasir Ambursa (Claimant)</p> <p>and</p> <ol style="list-style-type: none"> <li>i. Hon. Minister of Agriculture and Rural Development</li> <li>ii. The Executive Secretary, Agricultural Research Council</li> <li>iii. National Veterinary Research Institute, Vom</li> <li>iv. Mr. E.J.A. Okwori</li> <li>v. Federal College of Veterinary and Medical Laboratory Technology, Vom Plateau State (Respondents)</li> </ol>	NICN/ABJ/231/2018	<p>The claimant was issued a suspension letter by the 4<sup>th</sup> Respondent and he instituted an action for wrongful suspension, withdrawal of schedule of duty, withholding of salary and closure of office. Judgment had been delivered in this case on the 16<sup>th</sup> November, 2021</p>	National Industrial Court, Abuja Division.	<p>M.K. Habila &amp; Co. (Fidelity Chambers) Barristers, Solicitors and Consultants, NO.4D Kashim Ibrahim Street, Jos, Plateau State.</p>	<p>This matter emanated from the Federal College of Veterinary and Medical Laboratory Technology, Vom.</p> <p>Waiting for a hearing notice</p>

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			where the court granted the Applicant Relief 4 and awarded Five Hundred Thousand (N500,000.00)Naira as general damages against the Respondents			from the Court.
4.	<p>Malam Muhammad Nasir Ambursa (Applicant)</p> <p>And</p> <p>i. National Veterinary Research Institute, Vom</p> <p>ii. The Registrar, Senior District Court, Jos (Respondent)</p>	PLD/J545M/2019	<p>The Claimant/Applicant instituted an action against the Respondents seeking an order for the relief of certiorari for the purpose of being quashed the proceedings, ruling and decision of the Senior District Court, Jos held on the 4<sup>th</sup> July, 2019 in Suit NO.SDC/122/2019.</p> <p>The case went into hearing and Judgement was delivered in July, 2019 by quashing the proceedings, Ruling and decision of the Senior District Court.</p> <p>The sum of Ten Million Naira (N10,000,000.00 ) was awarded to the Applicant against the Institute as general damages.</p> <p>The Institute has filed Notice of Appeal and Stay of Execution at the Court of Appeal.</p>	Plateau State High Court, Jos	M.K. Habila &Co (Fidelity Chambers) Barristers, Solicitors and Consultants, NO.4D Kashim Ibrahim Street, Jos, Plateau State.	<p>This is Federal College of Veterinary and Medical Laboratory Technology, Vom case. The whole proceedings at the Senior District Court, Jos was handled by the college without any recourse to the Institute. The complete record of proceedings at the High Court has not been transmitted to the Court of Appeal, Jos Division.</p> <p>The college should also pay the Judgment sum in the event the case did not scale through at the Court of Appeal.</p>

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5.	<p>Malam Muhammad Nasir Ambursa (Plaintiff)</p> <p>And</p> <p>i. Hon. Minister, Federal Ministry of Agriculture and Rural Development</p> <p>ii. Executive Secretary, Agricultural Research Council of Nigeria</p> <p>iii. Mr. E.J.A Okwori</p> <p>iv. Federal College of Veterinary and Medical Laboratory Technology, Vom</p> <p>v. Executive Director, National Veterinary Research Institute, Vom (Defendants)</p>		<p>The Plaintiff took up a writ of summons against the Defendants seeking reliefs that the inclusion of his phone number on the hand sanitizer produced by FCVMLT, Vom was instigated by Mr. E.J.A Okwori without his knowledge and is wrongful, illegal, ultra vires, malicious, mischievous and cynical attempt to maliciously indict him. He also sought monetary damages for the unauthorized usage of his phone number which has resulted in harassment, humiliation and annoyance. The Plaintiff also seek a declaration that he is entitled to Twenty Million Naira (N20,000,000.00 ) as exemplary and aggravated damages against the Defendants jointly and /or severally on the principle of UBI IUS IBI REMEDIUM. Memorandum of appearance has been entered and Statement of Defence filed and served.</p>	<p>Plateau State High Court, Jos</p>	<p>M. K. Habila &amp; Co (Fidelity Chambers) Barristers, Solicitors and Consultants, NO. 4D Kashim Ibrahim Street, Jos. Plateau State.</p>	<p>This is Federal College of Veterinary and Medical Laboratory Technology case.</p> <p>Waiting for a hearing notice.</p>
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**Kindly note:** Case number **3, 4** and **5** emanated from the Federal College of Veterinary and Medical Laboratory Technology, Vom. With the current Act establishing the college, the Institute is no longer Respondents in the above cases. The Institute has prepared processes to file in court for the striking out of the Institute's names in the above mentioned cases.

### CHALLENGES

1. There is a need to employ another legal personnel in the unit.
2. Training on specific legal areas such as grant management, intellectual property etc to meet the mandate of the Institute.

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## INTERNAL AUDIT

The NVRI Internal Audit Department was established in line with the Financial Regulations which states that for every self-accounting MDA “an Internal Audit Units is established to provide a complete and continues audit of the Accounts and records of revenue and expenditure, plants, allocated stores and unallocated store....”

### **FUNCTIONS OF THE INTERNAL AUDIT INCLUDE:**

- i. Ensuring compliance with rules, regulations and procedures in the conduct of governments business
- ii. Ensuring that adequate and accurate books of accounts and records of all activities of the Institute are kept in accordance with the necessary standards of operation.
- iii. Examining the procedures and processes of all major operations of the Institute with the aim of identifying areas where efficiency and effectiveness can be improved
- iv. Ensuring that errors/frauds are prevented or detected as early as possible
- v. Ensuring that proper internal control, checks and balances are put in place and operational so as to ensure that activities and resources are channeled towards the overall goals of the organization.
- vi. Liaising with External Auditors in ensuring that Accounts are prepared in accordance with International Accounting Standards

### **NOTABLE ACTIVITIES**

During the year under review, the Department performed the following:

- i. Monthly post-payment checks of staff salaries and ensured that staff who retired or transferred their services were promptly deleted from the payroll
- ii. Maintained an up to date query register and followed up on Audit queries raised
- iii. Ensured that contracts were executed according to the terms of the contracts and ensured that necessary tax deductions were effected
- iv. Interacted with the Accounts Department on ways and means of improving internal control.

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### **ACHIEVEMENTS**

- i. A 100% prepayment audit on all transactions sent to the Audit was achieved.
- ii. Paid vouchers were carefully reviewed to ensure that proper retirements were done with adequate supporting documents
- iii. Observations and Recommendations were made to the Chief Executive on strengthening of Internal Control and improving efficiency.
- iv. Ensuring that goods supplied to Dagwom farm, Poultry and LID were properly inspected and verified base on the contract agreement specification.

### **CHALLENGES**

- i. Inability to conduct routine auditing of all the outstation laboratories due to paucity of funds
- ii. Lack of training and capacity development for staff of the department for the past 3 years.
- iii. Inadequate number of trained staff to provide the necessary auditing requirement of the Institute

### **FUTURE PLAN**

Broaden the scope of operations to include operational Audit and Risk assessment in line with modern Auditing



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## LIBRARY AND ICT DIVISION

The National Veterinary Research Institute library and ICT is a basic organ of the institute established to enhance Research and Development (R&D) and the dissemination of information to the general public. It is saddled with the following objectives:

- To provide the research scientists access to the right information in the right format at the right time.
- To establish a computerized information system for easy access to the current information on veterinary and related areas from all over the world.
- To provide an opportunity for all states of the federation to access scientific information on the country's animal health and production activities.
- To create and manage local databases on the country's animal health and production research activities.
- To provide extension workers nationwide access to expert systems which cover a wide range of problems and solutions to enable them transfer this knowledge to end users.
- To provide scientific information services to researchers and academicians from universities, polytechnics and other institutions of higher learning and businessmen and policy makers.
- To link up with international computerized information systems (CAB Abstracts, Agricola Database, Medline, FAO Agrindex and Agris Databases) to facilitate access and sharing of information.

These activities are performed by the four sections of the library, namely, the Circulation and Reference, the Technical and Acquisition, Serial and the e-library.

### Major activities

The Covid-19 pandemic slowed down major activities in the library. However, an appreciable number of clientele were attended to.

Library Acquisition: sixty (60) monographs on Fish Management, Diseases Control, and Feed Formulation etc were received into the library as donations from the National Agricultural Extension and Research Liaison Services (NAERLS), Ahmadu Bello University Zaria. 27 Theses from staff who had completed their studies in various degree programmes were also received into the library.

During the year review, two staff from the library went on training, 1 on MSc programme in Computer Science and 1 on Diploma study on Library and Information Science.

Three students on Industrial Training (IT), two from Plateau State Polytechnic B/Ladi and 1 from University of Jos were trained on various aspects of Library science.

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### CHALLENGES:

- No functional photocopier in the library.
- The library application management software requires update.
- No internet facilities, and lack of ICT facilities such as desk top computers, scanner, and printer.

### CYBER CAFÉ UNIT

This unit is responsible for internet services and interconnectivity within the institute. The staff also assist in resolving internet downtimes, software's upgrades, software installations, troubleshooting hardware and IT equipment maintenance, as well as managing the institute's website.

During the year under review, the basic activities the team carried out include;

1. Managed the created official email with (NVRI) domain addresses for staff
2. Managed the NVRI website [www.nvri.gov.ng](http://www.nvri.gov.ng)
3. Development of software's application for the Institute
4. Computer maintenance and repairs
5. Handle all media/audio visual equipment during every program happening within the Institute.
6. Installed and upgraded software on personal computers
7. Attended ICT meetings/presentations and deliberated on IT related issues as a team
8. Training of IT students on computer basics
9. Scan and printed documents
10. Provide Internet support for Zoom meetings and Programs

### **The team experienced some constraints listed below;**

- i. No general Internet Service for the Institute
- ii. User with very little or no knowledge on use of computer and internet
- iii. Lack of hard and software's for installation, upgrade and maintenance

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## LIVESTOCK INVESTIGATION DIVISION

### Functions and Mandate

The major activities of the Division are those of adaptation of exotic animals through cross breeding (Artificial Insemination), provision of animals for vaccine production and for research as well as the production of livestock forage and feed formulation.

The farm is divided into eleven (11) sections: Health, Dairy, Piggery, Beef, Equine, Goat and Sheep production. Others are cultivation and pasture development, Feed-mill, Laboratory cattle and replacement, Farm Machinery and Agronomy, Artificial Insemination & Liquid Nitrogen.

### SPECIFIC ACTIVITIES

During the period under review, the Division performed the under-listed activities:

- Semen collection, evaluation, processing and preservation in chilled and frozen state.
- Improving indigenous breeds of cattle through artificial insemination with semen of Friesian breeds processed at NVRI Vom for improved milk and meat production
- Herd health fertility check and selection of animals for planned breeding programmes
- Manpower development in artificial insemination through capacity building.
- Stocking, selection of breed or multiply dairy cattle as well as milk production and milk products.
- Practical demonstration/teaching students of the college and other students on industrial training.
- Management of exotic Friesian bulls and other cross bred bulls.
- Maintenance and management of weaned calves to heifers and yearling bulls or bull calves.
- Daily observation of animals to assess their health status/record keeping.
- Prophylactic de-worming of the herds in the farm.
- Annual vaccination of all the herds on the farm against Haemorrhagic Septicaemia, Black quarter, Contagious Bovine pleuropneumonia, PPR, ASV, Hantavac, FMD, LSD
- Fattening of cattle for vaccine production through feedlot operation.
- Management of pasture grasses and legume in the paddocks and fields.
- Maintenance, repairs and servicing of farm tractors, implements and machineries.
- Formulating and production of feed for various classes of animals on the farm.

### ii. ACHIEVEMENTS

- Maintenance and periodic assessment of preserved bovine frozen semen
- Herd health fertility check of all herds to determine their reproductive status
- Successful calving of 33 calves in the year 2021.

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- Successful completion of a collaborative research with an international organisation to determine the behavioural pattern of pigs. The farm has a functional piggery unit now.
- Production of 600 metric tons of silage and 4,140 bales of hay.
- All yearlings were properly managed to bulls and stingers and eventually distributed to dairy and beef section accordingly.
- Practical demonstration of various techniques to farmers, undergraduate and/ postgraduate students on excursions, SIWES and other visitors.
- Renovation of one bull pen and one goat pen

### iii. CHALLENGES

- Near non-existence of electricity supply to the farm.
- Lack of pure Friesian bulls for AI.
- Delay in the supply of drugs.
- Lack of standard laboratory setting, equipment and offices for AI operation.
- Inadequate/dilapidated bull pens.
- Lack of adequate and sustained supply of liquid Nitrogen.
- Inadequate office accommodation/furnitures.
- Lack of protective wears for the worker e.g. rain-boots, raincoats, overall and hand gloves, nose mask, goggles etc.
- Inadequate working equipment e.g. wheelbarrow, shovels, garden forklifting machine and water borehole.
- The Institute has only **one (1) Tractor Operator**
- The tractors are old and constantly breakdown thus draining the resources of the institute.
- The Institute has a very old silage harvester.
- The serviceable parts for the tractors are always **insufficient** and always provided very **late**.
- The farm input and agro-chemicals (fertilizer, herbicide, seeds, and seed-dress) are always supply late into the farming season.
- Security challenges on the farm.
- **No toilet facility.**

### iv. FUTURE PLAN

- There is need for Electro Ejaculator (Electrojac 6)
- Continuous production of chilled and frozen semen for use.
- Synchronization and insemination of all the heifers.
- On-farm and on-station insemination as planned as well as on request.
- Prepare a Breeding plan for 2022.
- Selection of only dairy cattle breeds with high dairy potential for the section.
- Increase the production capacity of the dairy cattle.
- Cases of sick animal be reported promptly to the appropriate authorities.

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- Feeding animals with supplements (concentrates, salt) every morning before releasing them out for grazing.
- There is the need for new tractors, disc mower, silage harvester and silage trailers.
- There is the need for baling twine on time for hay making.
- Over grown pasture in the paddocks be trimmed and feed other animals so as to ensure uniform growth.
- Elimination of weeds from the pasture grass the paddocks.

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## PARASITOLOGY DIVISION

Function/ Mandates:

- 1) To conduct research and diagnosis of parasitic diseases and proffer possible preventive and control Measures.
- 2) To conduct surveillance of parasitic diseases especially those of zoonotic importance.

Achievements:

### **Routine Diagnosis**

During the year under review the Division received, processed and analyzed a total of 3090 samples. From the samples received, 1476 (47.8%), 1318 (42.7%) and 306 (9.9%) were analyzed in the Protozoology Helminthology and Entomology units, respectively. The detail of the samples examined and the results are presented in tables 1-3.

### **Production of ethno-veterinary products**

A total of **1,638 Scabicur® Products** comprising Soap (1,245), Ointment (243) and Lotion (150) were produced and supplied to the Consultancy Department of the Institute. Details are presented on table 4.

### **Supervision of student's projects**

Staff of the Division assisted in the laboratory analysis of samples for various parasites for 35 students from different institutions across the country. Samples analyzed were for 15 OND, 5 HND, 9 BSc.4 MSc. and 2 PhD candidates.

### **Research collaborations**

Staff of the Division were also involved in analyzing some samples from the REDDISSE Program of the Institute.

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**Table 1. Samples received and analyzed in the protozoology laboratory unit**

S/N	Animal species	No. of samples	Type of sample	Results
1	Bovine	334	Blood and Brain	<i>Babesia bigemina</i> , <i>Babesia bovis</i> , <i>Trypanosoma spp.</i> , <i>Anaplasma marginale</i> and <i>Theileria spp.</i>
2	Canine	422	Blood	<i>Babesia canis</i>
3	Caprine	24	Blood	Negative
4	Equine	40	Blood	<i>Babesia equi</i>
5	Ovine	23	Blood and Brain	<i>Babesia spp</i>
6	Avian	433	Blood	<i>Plasmodium spp</i> , <i>Haemoproteus spp</i> , <i>Trypanosoma spp</i> and <i>Leucocytozoon spp</i>
7	Human	200	Blood	<i>Plasmodium spp</i>
	<b>TOTAL</b>	<b>1,476</b>		

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**Table 2: Samples analyzed in the helminthology unit**

S/N	Animal Species	No. of sample	Type of Samples	Results
1	Avian	398	Intestines and worms	<i>Coccidia</i> oocysts, <i>Ascaridia galli</i> , <i>Capillaria longicollis</i> ; <i>Syngamus trachea</i> , <i>Trichuris trichuria</i> .
2	Bovine	278	Fecal, cysts, urine and worms	<i>Cysticercus</i> spp, <i>Schistosoma bovis</i> , <i>Paramphistomum</i> spp, <i>Oesophagostomum radiatum</i> , <i>Cooperia pectinita</i> , <i>Bunostomum phlebotomum</i> , <i>Dicrocoelium</i> spp, <i>Eimeria</i> spp, <i>Fasciola</i> spp
3	Canine	16	Fecal, worms and intestines	<i>Ancylostoma caninum</i> , <i>Taenia</i> spp
4	Caprine	390	Fecal, worms, cysts and intestines	<i>Cysticercus tenuicollis</i> , <i>Dicrocoelium dendriticum</i> <i>Oesophagostomum</i> spp, <i>Eimeria</i> spp, <i>Trichostrongylus</i> spp, <i>Haemonchus contortus</i> , <i>Fasciola</i> spp, <i>Bunostomum</i> spp, <i>Strongyloides</i> spp, <i>Strongyl</i> eggs, <i>Hydatid</i> cyst, <i>Paramphistomum cervi</i>
5	Equine	4	Fecal and worms	NO PARASITE FOUND
6	Feline	3	Fecal and intestines	NO PARASITE FOUND
7	Laprine	20	Fecal	<i>Oesophagostomum</i> spp, <i>Eimeria</i> spp, <i>Strongyloides</i> spp, <i>Hymenolepsis</i> spp, <i>Trichostrongylus</i> spp
8	Ovine	83	Fecal, worms, cysts and intestines	<i>Oesophagostomum columbianum</i> , <i>Eimeria</i> spp, <i>Trichostrongylus</i> spp, <i>Haemonchus contortus</i> , <i>Fasciola</i> spp, <i>Bunostonun</i> spp, <i>Strongyl</i> eggs
9	Porcine	26	Fecal, cysts and worms	<i>Ascaris suum</i> , <i>Eimeria</i> spp, <i>Taenia</i> spp,
10	Human	100	Fecal	<i>Schistosoma mansoni</i> , <i>Ascaris lumbricoides</i> , <i>Trichuris trichuria</i> <i>Ancylostoma duodenal</i> , <i>Enteroamoeba</i>
<b>TOTAL</b>		<b>1,318</b>		



## NVRI 2021 ANNUAL REPORT

**Table 3. Number of samples analyzed in the entomology unit**

S/N	Animal Species	Type of sample	No of samples	Results
1	Canine	Skin scraping, Ticks and Fleas	192	<i>Demodex canis</i> , <i>Rhipicephalus sanguineous</i> , <i>Rhipicephalus(Boophilus) spp</i> , <i>Ctenocephalides canis</i>
2	Avian	Lice	33	<i>Menacanthus stramineus</i>
3	Bovine	Ticks	58	<i>Amblyoma variegatum</i> , <i>Rhipicephalus(Boophilus) spp</i>
4	Caprine	Ticks	14	<i>Amblyoma variegatum</i> , <i>Hyaloma truncatum</i>
5	Ovine	Ticks	3	<i>Amblyomma variegatum</i> , <i>Rhipicephalus bursa</i>
6	African giant Rat	Earwig	7	<i>Hemimerous talpoides</i>
<b>TOTAL</b>			<b>306</b>	

**Table 4: Type and number of ethnoveterinary products produced in 2021**

YEAR	PRODUTS			TOTAL
	Soap	Ointment	Lotion	
<b>2021</b>	1,245	243	150	<b>1,638</b>

### CHALLENGES:

- i. Insufficient microscope for routine diagnosis.
- ii. Lack of ELISA reader, sensitive balance, water bath and PH meter in the immunology Laboratory.
- iii. Lack of consumables for diagnostic work in the laboratories
- iv. Irregular water supply in the laboratories
- v. inadequate number of requisite staff especially in the Laboratory Technician and assistant cadre.

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## PLANNING DIVISION

The Planning Division is charged with the responsibility of collecting, collating, analyzing and disseminate all kinds of data for smooth management of the Institute's projects/programmes and effective implementation of the Institute's mandate and strategic plan. It also serves as the DATA BANK of the Institute with Monitoring & Evaluation domiciled in the Division.

During the period under review, the Division processed several data relating to research, vaccine production, socio-economic activities, Institute's landed properties and Human Resource planning.

The data collected were used to:

- Response to the request by Agricultural Research Council of Nigeria (ARCN) on the Instrument for Data collection for Agricultural Research System Report for year 2020.
- Rate staff of the Institute that graduated from University of Maiduguri in Veterinary Medicine (DVM) as requested by the University.
- Analyze the skill gaps of teachers in NVRI Staff Schools as requested by the Management Board of the Schools.

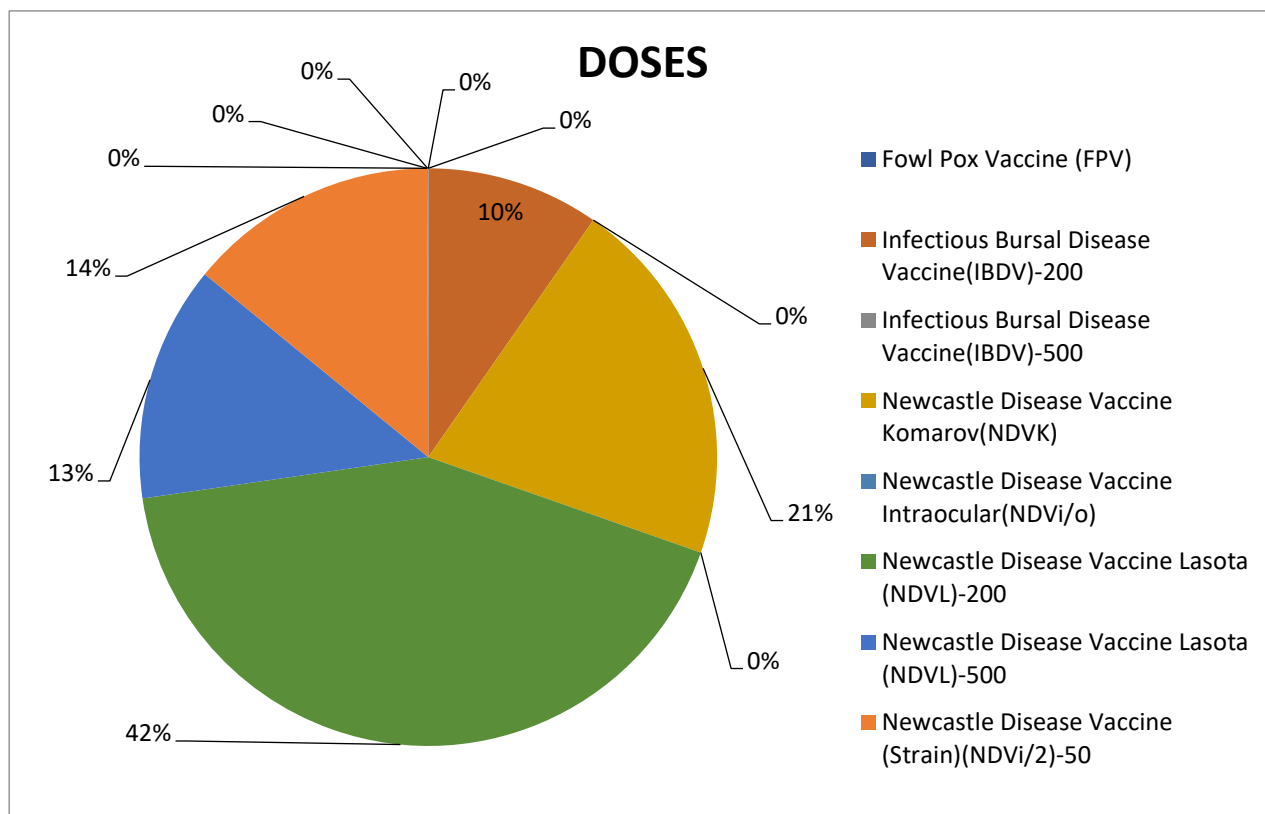
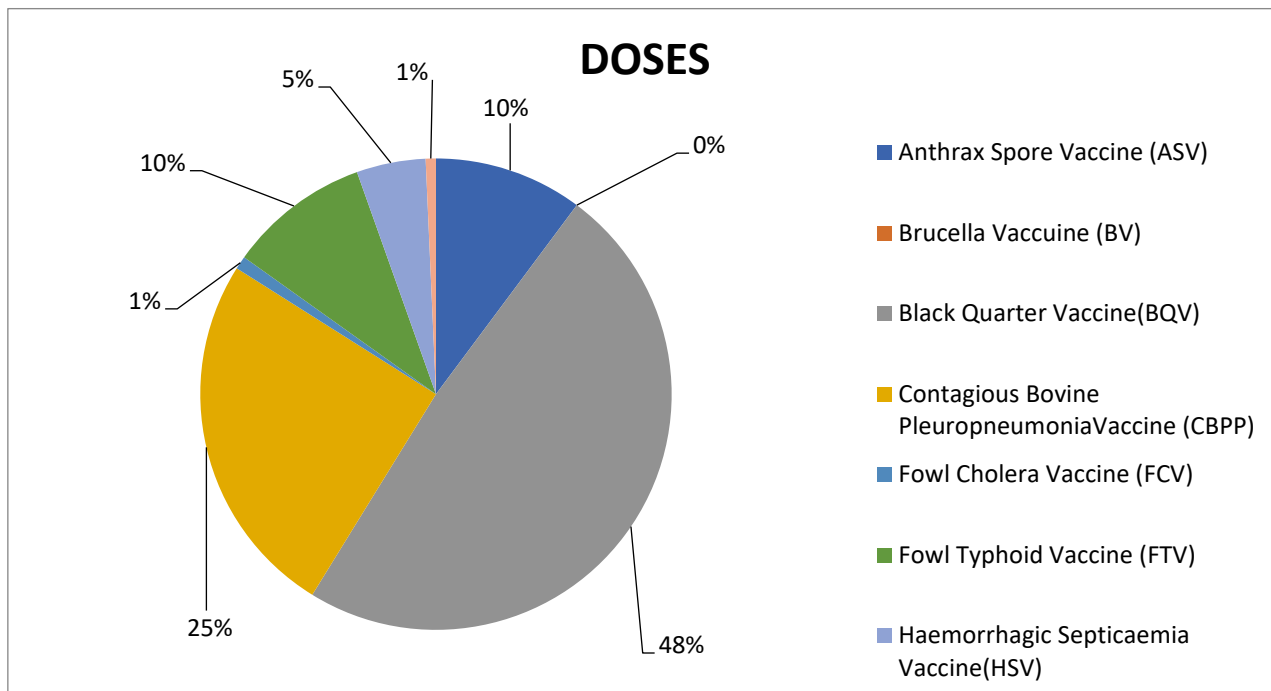
Other activities that the Division carried out included:

- Engagement of Staff of the Division during the International Committee of the Red Cross (ICRC) Refresher Course for Community Animal Health Workers (CAHWs) from Kano & Nassarawa States on the 5<sup>th</sup> -11<sup>th</sup> March and 11<sup>th</sup> -17<sup>th</sup> April, 2021 respectively.
- The Land unit inspected Madara Quarters, Livestock Investigation Farm, NVRI Dam and Integrated Dairy Farm. Satellite images of the Institute maps were produced.
- Updated the 2021 Institute Nominal Roll for the purpose of statistical analysis.
- Distributed the Institute's publications to dignitaries that visited the Institute.
- Designed hand fliers on the technologies generated by NVRI Vom. These fliers were used during the 2021 trade fair in Nassarawa State.
- Processed and produced one hundred and forty (140) Staff ID cards.
- Compiled and analyzed the vaccine production data including the vaccine demand & supply data.
- Designed booklet for NVRI vaccines.
- Planned and organized staff training on Project Management PRINCE2 Methodologies.

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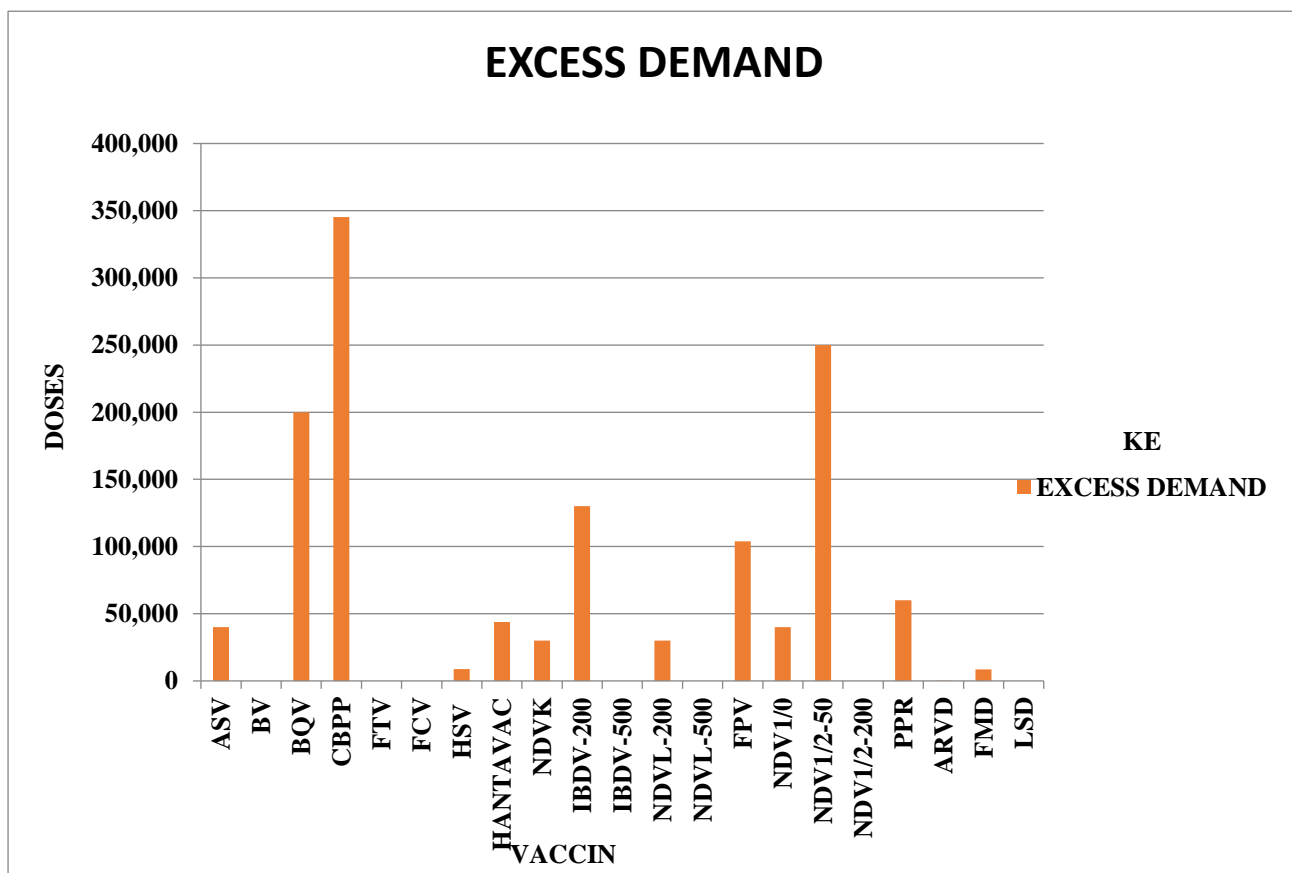
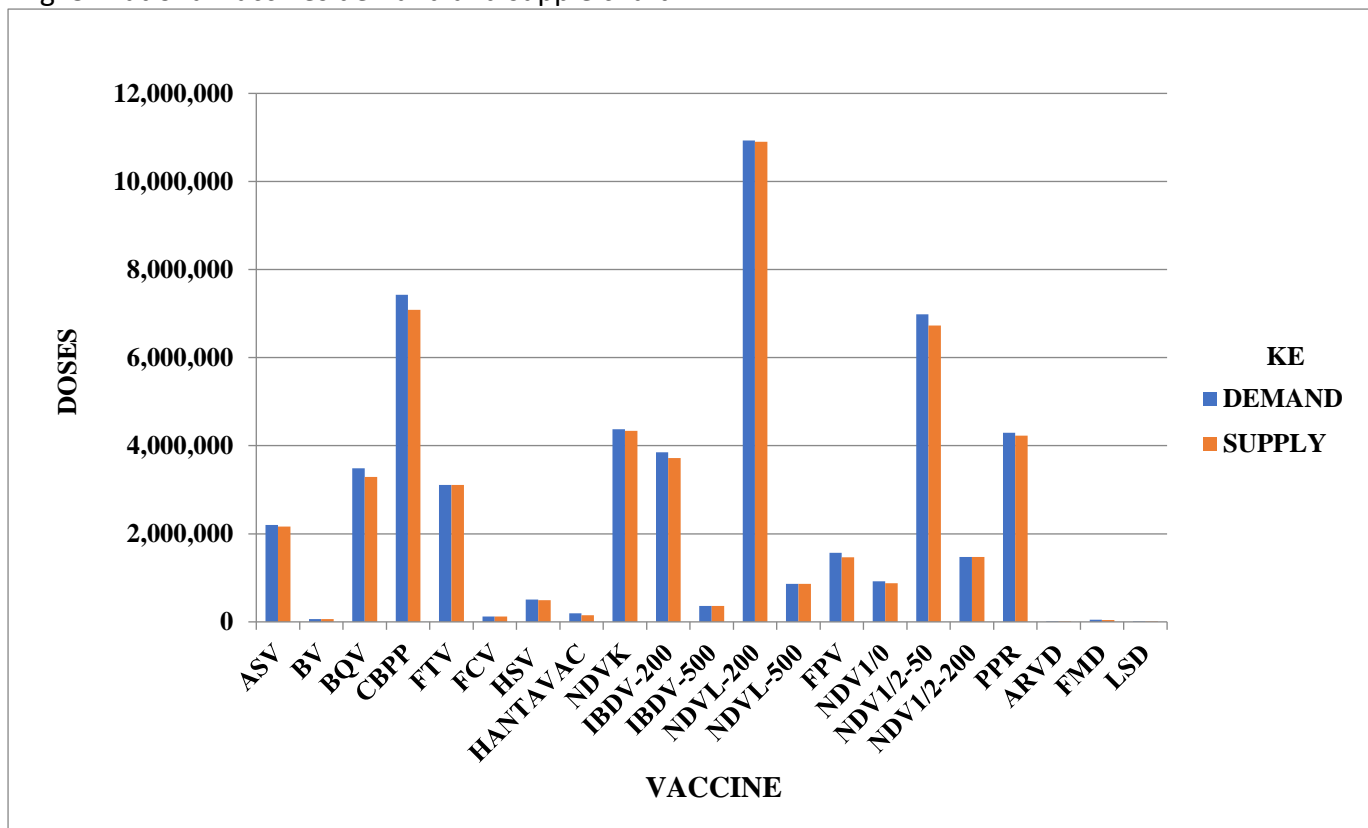
The bacterial and viral vaccine production as well as vaccine demand, supply & excess demand charts are depicted in the following figures.

Fig1: Bacterial Vaccine Production Chart



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Fig. 3: National vaccines demand and supply chart



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### WORKSHOPS AND TRAININGS:

- Training on Combating Corruption in Public Procurement at Anti-Corruption Academy of Nigeria (ACAN), Keffi, Nasarawa State from 9<sup>th</sup> – 11<sup>th</sup> August, 2021.
- Project Management using Prince 2 Foundation at Novel Suites and Grill in Rayfield Plateau state from 12<sup>th</sup> - 14<sup>th</sup> October, 2021.
- Monitoring & Evaluation (M&E) and Digitalization training by Nolia Consults Ltd at Jos Business School, Rayfield Plateau State from 8th - 13th November, 2021.

### Future Plan

- To establish effective and efficient information systems to manage the Institute's Databank.
  - Good planning and organizational skills with a strong focus on attention to details, quality and high performance.
- To get a road map that will ascertain and ensure projects in the Institute are Desirable, Achievable and Viable.
- To build a working Monitoring and Evaluation template for all Departments.
- To introduce HR software to effectively manage HR Data.
- To introduce the use of Quick Response Codes (QR) and Bar Codes on the Institute's Staff Identification Cards (ID Card), labels of vaccines and biological products respectively. The QR and Bar Codes will go a long way in securing the Staff ID Cards, advertising of Institute's products, tracking etc.

### Challenge

- Inadequate office space for staff and for keeping sensitive documents.

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## PLANT AND LABORATORY EQUIPMENT MAINTENANCE (P&LEMD) DIVISION

Being a newly created Division under the Quality Assurance Department, the P&LEMD is saddled with the responsibilities of ensuring the census, workability and maintenance of all Plants and laboratory equipment in all the technical Divisions of the Institute. The Division is also responsible for the routine servicing/maintenance, record logs, and in-house calibration of critical laboratory equipment. These are a requirement towards liaising/contracting an external ISO 17025 certified calibration company to periodically visit the institute to service and calibrate in traceability to international standards.

Activities of the Division are geared towards achieving the goal of the Institute in obtaining ISO 17025 certification for our laboratories.

### Staff strength

The Division is currently manned by two senior staff which is grossly inadequate. In order to meet up with our basic activities, eight more staff of various qualifications/cadre are urgently needed. Specifically, the Division need one each of Electrical/electronic engineer, Veterinary Doctor, two each of Medical Lab technician and electrical/mechanical technician, an Administrative staff and a cleaner

### Office space

Presently the Division is operating from a temporary office accommodation. As such, the office space is inadequate. The activities of the Division will benefit and greatly improve with the provision of offices to accommodate the HOD, senior staff, junior staff and a space for safe keeping of tools/equipment. Other requirements are:

- A large space office to serve as servicing, testing and monitoring of retrieved faulty equipment for repairs
- Working tools, testing instruments, calibration weight, balances, mechanical/electrical analyzing tools, IS unit traceable weights etc.

### Divisional activities

1. The creation of database of equipment in all the technical Divisions of the Institute, in line with the requirement for accreditation and or certification of our products by Standard Organization of Nigeria (SON), National Agency for Food and Drug Administration and Control (NAFDAC) and International Organization for Standards (ISO).
2. The Division has written three Standard Operating Procedures (SOPs) in regards to equipment instructions and procedural report(s) of faulty equipment and installations of newly acquired ones. More SOPs will be produced as the division takes hold of further activities. Other required documents such as Site Master File (SMF), Job descriptions etc. are being computed
3. The Division conducted a one-week training for some staff designated as Equipment Maintenance Officers (EMOs), nominated from some of the technical Divisions of the

## NVRI 2021 ANNUAL REPORT

Institute. The training was entitled “**Basic Metrology and equipment maintenance in accordance to ISO 17025 standard in testing laboratories**”

### **Suggestions on the Way Forward**

1. There is the urgent need to engage a reputable certified external service/ calibration company for periodic calibrations of equipment in the Institute in line with international standards
2. Appoint and train a staff from the Quality assurance department to be part of the procurement Committee. This will enable the procurement team to have an insider to check the suitability of all materials supplied to the Institute
3. Initiate, encourage and improve inter divisional cooperation in terms of equipment usage for cost-effective research and diagnosis
4. Intend, with the Management approval to proceed to PANVAC, Ethiopia to participate in their annual laboratory appraisal, calibration and repairs/retirement for equipment in their fully accredited and certified IAS 17025 laboratory.

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## POULTRY DIVISION

### FUNCTIONS /MANDATE

1. To produce fertile eggs for vaccines production.
2. To produce chicks for vaccine testing and research purposes.
3. Investigate diseases of poultry for improved productivity.
4. Investigate nutritional and management aspects of all classes of poultry and their effects on production.
5. Introduction, adaptation, and disease management of exotic breeds of poultry.
6. Teaching/training of students from tertiary institutions, colleges and universities.

### ACHIEVEMENTS

- 1) Staff members (3) attended a 3-week training on Artificial Insemination in chickens and turkeys to improve production.
- 2) Raising birds as replacement for vaccine birds.
- 3) Supply of fertile eggs for the vaccine production laboratories.
- 4) Provision of fertile eggs for the Research and Quality control laboratories.
- 5) Production of quails and other species of birds in the farm.
- 6) Hatching of quails and other exotic birds for undergraduate and post graduate studies/research.
- 7) Provision of fertile eggs for postgraduate research.

### CHALLENGES

1. Biosecurity of the farm is compromised due to lack of perimeter fence
2. Inadequate number of junior staff to effectively man the farm.
3. Lack of offices/conveniences for staff
4. Dilapidated hatchery due to damage by rainstorm.
5. Old and obsolete incubators that need urgent replacement.
6. Lack of mini-Poultry processing plant.
7. Dilapidated administrative block/staff offices with insufficient tables and chairs.

### FUTURE PLANS

1. Increase egg production capacity for vaccine production.
2. Research and publications in peer reviewed journals.
3. Training of staff for better productivity
4. Hatching and sales of Noiler/Quail chicks will be intensified



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## HEALTH SECTION ACTIVITIES

1. In year under review, Biosecurity optimization formed the fulcrum of our efforts towards the prevention, mitigation, and control of diseases in the farm. This principle yielded significant reduction in the number of disease incidents.
2. The frequent training of all cadre of staff on Biosecurity as it relates to management practices and productivity helped in no small measure.
3. Strict reprimand and punishment for erring staff ensured that the concept of Biosecurity took root quickly leading to its quick acceptance and application.
4. Similarly, we employed early prophylaxis as a tool in mitigating production losses due to disease. This was possible with our early and accurate prediction of disease signs and trends.
5. In the year under review, there was no disease outbreak in the Division. This, to a large extent was due to our strict biosecurity protocols, monitoring the hygiene and sanitation of both staff and farm environment.

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## EGG PRODUCTION AND UTILIZATION

**Table 1: Vaccine Birds Egg Production and Disposal**

Month	Total production	Broken	Hatching	Virology Setting	B/factory	DEA	Sales
Jan	56,782	7,956	-	7,320	31,590	6,625	3,291
Feb	51,318	2,333	-	21,420	22,770	3,770	1,025
March	41,053	2,988	-	15,066	18,030	3,280	1,689
April	16,856	1,058	-	8,548	5,850	1,080	320
May	1,865	159	-	346	-	900	460
June	39,240	7,076	2,000	12,860	4,500	7,474	5,330
July	92,765	8,370	4,000	24,980	42,390	7,725	5,300
August	114,749	9,929	4,000	28,190	64,440	8,190	-
Sept	114,272	9,082	4000	19,140	75,690	6,360	-
Oct	106,609	9,049	4,000	17,970	68,520	7,070	-
Nov	106,951	9,033	6,038	19,930	65,820	6,130	-
Dec	113,444	4,097	4,087	710	103,140	1,410	-
Total	855,904	71,130	28,125	176,480	502,740	60,014	17,415

## NVRI 2021 ANNUAL REPORT

**Table 2: Vaccine eggs supplied to Production and Research Laboratories**

MONTH	NDV	IBDV	AI	Q/C	FPV	RES	ARV
Jan	4,200	-	510	210	-	-	-
Feb	16,400	-	600	420	4,000	90	-
March	10,710	-	960	210	2,826	360	-
April	7,248	-	720	-	-	600	-
May	100	-	90	-	-	156	-
June	12,000	-	400	210	-	210	-
July	20,000	-	1,020	210	4,800	150	-
August	23,000	-	1,050	420	2,400	120	-
Sept	12,000	-	930	-	6,000	180	-
Oct	12,000	-	930	210	4,800	600	-
Nov	3,000	-	2,490	420	2,400	600	13,000
Dec	-	-	-	210	-	-	510
Total	120,658	-	9,700	2,320	27,226	3,066	13,510

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**Table 3: Egg Production from other species of birds**

Month	Quail A	Quail B	Black Bantam	Naked Neck	Ducks	Geese
Jan	1,631	11,319	505	30	623	28
Feb	2536	12,434	441	36	387	25
March	1871	5,836	275	29	586	23
April	231	5,677	331	31	229	21
May	42	4,530	525	7	85	7
June	-	1,591	520	20	86	1
July	-	-	145	3	181	6
August	-	-	-	-	177	5
Sept	-	-	-	-	1122	36
Oct	-	-	-	-	1758	20
Nov	-	-	-	-	1154	16
Dec	-	-	-	-	633	14
Total	6,311	41,487	2742	156	7,021	202

**N.B** At the end of July 2021, all the birds in the Quail and Exotic Sections were culled. This was done to check inbreeding. Plans will be made to replace them in 2022 after observing rest period for the houses.

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**Table 4: Egg Production from other species of birds (Cont.)**

Month	Fulani	Tiv	FUNAAB Alpha	Frizzle Feather	Turkey	Guinea fowl
Jan	243	65	30	25	-	25
Feb	34	41	34	35	7	11
March	230	33	6	30	6	93
April	207	55	17	11	-	750
May	298	61	68	15	-	1,363
June	346	73	63	5	-	989
July	47	43	36	4	-	328
August	-	-	-	-	-	-
Sept	-	-	-	-	-	-
Oct	-	-	-	-	-	-
Nov	-	-	-	-	-	-
Dec	-	-	-	-	-	-
Total	1,405	371	254	125	13	3559

**N.B** At the end of July2021, all the birds in the Exotic Section were culled. This was done to check inbreeding. Plans will be made to replace them in 2022 after observing rest period for the houses.

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## PRINTING AND PUBLICATION DIVISION

The printing and Publication Division of the National Veterinary Research Institute, Vom, was established as a Service Department of the Institute, to meet its numerous printing requirements/needs.

Since then, the Division has been responsible for publishing/printing all scientific and technical reports and journals of the Institute.

Other functions of the printing and publications include the printing of the following:

- Vaccine Labels
- Scientific Journals
- Official Sales Invoices
- Officials Receipts
- Yearly Calendar
- Official headed papers, envelopes and File Jackets
- Examination answers booklets for the colleges etc.
- Annual Report

### Major activities

The following jobs were successfully performed during the year under review. The printing of the under listed vaccine labels and other documents

NDV-I2	-	96,913 pieces
PPR	-	10,200pieces
HSV Working Seed	-	1,038 pieces
Hantavac Working Seed	-	605 pieces
Brucella	-	200 pieces
Sterile diluents	-	4800 pieces
FMD Buru Vac	-	150 pieces
Payment Voucher	-	1000 booklets
APPER form	-	5000 copies
Governing board files	-	1100 copies
Office File	-	8000 copies
ED/CEO headed paper	-	10,000 pieces

### CONSTRAINTS

- Shortage of Technical staff
- Lack of modern printing equipment
- Renovation /creation of additional offices through partition
- Creation of an independent entry (Exit) into the division
- Creation of toilet convenience for the division

### FUTURE PLAN

At the moment, there are several printing technologies evolving with benefits and value. The division will want to pursue a printing technology that will best suit the need of the Institute

## **NVRI 2021 ANNUAL REPORT**

in these modern times. The technology will also include the protection of the Institute's numerous brands. Other benefits of acquiring modern printing technology in the Institute are:

- i. We need a modern machine for printing of synthetic vaccine labels compare to other non-tire able water proof labels.
- ii. Revenue generation; the technology will serve the Institute and customers with similar needs
- iii. Speed and efficiency; usually, long production process is cut short and saves time.
- iv. Producing at the cheapest price possible will attract more customers
- v. Deliver goods of the right quality and quantity at the right time, and at the right price.
- vi. It motivates and boost the morale of staff etc

Based on the foregoing, the Division is appealing to the management to procure modern printing equipment.

### **TRAINING ACTIVITIES**

One staff of the division has successfully completed his HND program in Printing Technology at Kaduna Polytechnic.

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## QUALITY CONTROL DIVISION

### FUNCTIONS/MANDATE

The Quality Control Division is responsible for ensuring the implementation of quality management system for the production of veterinary vaccines, biologicals and general laboratory procedures in the institute in line with international standards. Therefore, the Division conduct in-house quality control tests on the vaccines to ensure that they have been appropriately prepared, packaged, labelled and stored. Furthermore, purity, sterility, viability, safety, potency tests are conducted on all the vaccines produced in the Institute. In addition, tests to ascertain the absence of foreign bodies are carried out on all batches of vaccines. Only batches of vaccines that meets the regulatory standards as safe and efficacious are certified before they are released to the end-user. Periodic assessment and auditing of all the institute laboratories are performed to ensure Good Laboratory Practice commensurate to international standards.

### A. SPECIFIC ACTIVITIES

#### a. Vaccines Quality Checks

- i. **Bacterial Vaccines:** A total of thirty-eight (38) batches of eight (8) Bacterial vaccines were received from Bacterial vaccines production division in 2021 for quality check and certification. These include;



## NVRI 2021 ANNUAL REPORT

**Table 1: List of Bacterial vaccines received.**

<b>S/N</b>	<b>Vaccine Type</b>	<b>Batch No.</b>
1.	Anthrax Spore Vaccine	05/2020
2.	Anthrax Spore Vaccine	01/2021
3.	Anthrax Spore Vaccine	02/2021
4.	Anthrax Spore Vaccine	03/2021
5.	Anthrax Spore Vaccine	04/2021
6.	Anthrax Spore Vaccine	05/2021
7.	Anthrax Spore Vaccine	06/2021
8.	Black Quarter Vaccine	01/2021
9.	Black Quarter Vaccine	02/2021
10	Black Quarter Vaccine	03/2021
11	Black Quarter Vaccine	04/2021
12	Brucella Abortus Vaccine	01/2021
13	Contagious Bovine Pleuropneumonia Vaccine	13/2020
14	Contagious Bovine Pleuropneumonia Vaccine	01/2021
15	Contagious Bovine Pleuropneumonia Vaccine	02/2021
16	Contagious Bovine Pleuropneumonia Vaccine	03/2021
17	Contagious Bovine Pleuropneumonia Vaccine	05/2021
18	Contagious Bovine Pleuropneumonia Vaccine	06/2021
19	Contagious Bovine Pleuropneumonia Vaccine	07/2021
20	Contagious Bovine Pleuropneumonia Vaccine	08/2021

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21	Contagious Bovine Pleuropneumonia Vaccine	11/2021
22	Contagious Bovine Pleuropneumonia Vaccine	12/2021
23	Fowl Cholera Vaccine	01/2021
24	Fowl Typhoid Vaccine	01/2021
25	Fowl Typhoid Vaccine	02/2021
26	Fowl Typhoid Vaccine	03/2021
27	Fowl Typhoid Vaccine	04/2021
28	Hemorrhagic Septicaemia Vaccine	01/2021
29	Hemorrhagic Septicaemia Vaccine	02/2021
30	Hemorrhagic Septicaemia Vaccine	03/2021
31	Hemorrhagic Septicaemia Vaccine	04/2021
32	Hemorrhagic Septicaemia Vaccine	05/2021
33	Hemorrhagic Septicaemia Vaccine	06/2021
34	Hemorrhagic Septicaemia Vaccine	07/2021
35	Hanta Vaccine	01/2021
36	Hanta Vaccine	02/2021
37	Hanta Vaccine	03/2021
38	Hanta Vaccine	04/2021

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ii. **Viral Vaccines:** A total of thirty-four (34) batches of eight (8) Viral Vaccines were received from Viral Vaccines Production Division in 2021 for quality check and certification. These include;

## NVRI 2021 ANNUAL REPORT

**Table 2: List of Viral vaccines received**

<b>S/N</b>	<b>Vaccine Type</b>	<b>Batch No.</b>
1.	Newcastle Disease Vaccine I <sub>2</sub> (50 doses)	17/2020
2.	Newcastle Disease Vaccine I <sub>2</sub> (50 doses)	01/2021
3.	Newcastle Disease Vaccine I <sub>2</sub> (50 doses)	02/2021
4.	Newcastle Disease Vaccine I <sub>2</sub> (50 doses)	03/2021
5.	Newcastle Disease Vaccine I <sub>2</sub> (50 doses)	04/2021
6.	Newcastle Disease Vaccine I <sub>2</sub> (50 doses)	05/2021
7.	Newcastle Disease Vaccine I <sub>2</sub> (50 doses)	06/2021
8.	Newcastle Disease Vaccine I <sub>2</sub> (50 doses)	07/2021
9.	Newcastle Disease Vaccine I <sub>2</sub> (50 doses)	08/2021
10.	Newcastle Disease Vaccine I <sub>2</sub> (50 doses)	09/2021
11.	Newcastle Disease Vaccine I <sub>2</sub> (50 doses)	10/2021
12.	Newcastle Disease Vaccine Lasota	13/2020
13.	Newcastle Disease Vaccine Lasota (200 doses)	01/2021
14.	Newcastle Disease Vaccine Lasota (500 doses)	01/2021
15.	Newcastle Disease Vaccine Lasota	02/2021
16.	Newcastle Disease Vaccine Lasota	03/2021
17.	Newcastle Disease Vaccine Lasota	04/2021
18.	Newcastle Disease Vaccine Lasota	05/2021
19.	Newcastle Disease Vaccine Lasota	06/2021
20.	Newcastle Disease Vaccine Komarov	01/2021
21.	Newcastle Disease Vaccine Komarov	02/2021
22.	Newcastle Disease Vaccine Komarov	03/2021
23.	Fowl Pox Vaccine	01/2021
24.	Infectious Bursal Disease Vaccine	01/2021
25.	Peste Des Petits Ruminant Vaccine	01/2021
26.	Peste Des Petits Ruminant Vaccine	02/2021
27.	Peste Des Petits Ruminant Vaccine	03/2021
28.	Peste Des Petits Ruminant Vaccine	04/2021
29.	Peste Des Petits Ruminant Vaccine	05/2021
30.	Anti-Rabies Vaccine	01/2021
31.	Anti-Rabies Vaccine	02/2021
32.	Anti-Rabies Vaccine	01 <sub>B</sub> /2021
33.	Anti-Rabies Vaccine	02 <sub>B</sub> /2021
34.	Foot & Mouth Disease Vaccine	01/2021

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### b. Vaccines sent to Pan Africa Veterinary Vaccine Centre (PANVAC), DebreZeit, Ethiopia for external Quality Control Test and Certification.

The following vaccines were sent to PANVAC in May, 2021.

**Table 3: List of Vaccines sent to PANVAC.**

S/N	Vaccine Type	Batch No.
1.	Anti-Rabies Vaccine (ARV)	01/2021
2.	Newcastle Disease Vaccine I <sub>2</sub> Thermostable (NDVI-2) 50 doses	17/2020
3.	Newcastle Disease Vaccine-Lasota (NDVL)	13/2020
4.	Contagious Bovine Pleuropneumonia Vaccine (CBPP)	13/2020
5.	Contagious Bovine Pleuropneumonia Vaccine (CBPP)	02/2021
6.	Contagious Bovine Pleuropneumonia Vaccine (CBPP)	03/2021
7.	Anthrax Spore Vaccine (ASV)	05/2020
8.	Anthrax Spore Vaccine (ASV)	01/2021
9.	Haemorrhagic Septicaemia Vaccine (HSV)	01/2021
10.	Haemorrhagic Septicaemia Vaccine (HSV)	02/2021

## ACHIEVEMENTS

### a. Vaccines Testing and Certification

- i. Vaccine quality checks have been completed on **32** batches of bacterial vaccines out of 38 batches submitted in 2021 and certificates have been issued to the producers. Work is currently on-going on the remaining 6 batches.
- ii. Vaccine quality checks have been completed on **24** batches of viral vaccines out of 34 batches submitted in 2021 and certificates have been issued to the producers. Work is currently on-going on the remaining 10 batches.

## CHALLENGES

- i. Inadequate laboratory materials such as media, reagents and glass wares,
- ii. Lack of essential equipment such as Centrifuge for the Cell Culture laboratory.
- iii. Lack of Equipment in the Molecular Biology laboratory.
- iv. Experimental house needs to be re-furbished for potency and safety assay of Institute vaccines.
- v. Faulty Bio safety cabinets, refrigerators and air conditioners

## FUTURE PLAN

- i. Equipping the Molecular Biology section of the Division.
- ii. Provision of essential equipment, media and reagents required by the Division.
- iii. Equipping the experimental animal house

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## RABIES LABORATORY

Rabies Laboratory is charged with the following mandates: -

- i. Conduct research on rabies virus and rabies-related Lyssaviruses that cause neurological disorders.
- ii. Conduct laboratory diagnosis of animal rabies caused by rabies and rabies-related *Lyssaviruses*, using *in vitro* and *in vivo* methods.
- iii. Development and production of rabies antigens and antisera for research and diagnosis.
- iv. Assess antigenicity of rabies vaccine and vaccine viruses by *in vitro* and *in vivo* methods
- v. Evaluation of NVRI produced rabies vaccines through the sero-monitoring of vaccinated dogs
- vi. Participation in national surveillance of rabies and rabies-related viruses in domestic animals and wildlife
- vii. Participation in rabies proficiency test administered annually by the Nancy laboratory for rabies and wildlife, France, alongside other reputable laboratories in the world
- viii. Training and capacity building of personnel.

### Notable Activities

#### i) Laboratory Diagnosis

A total of 219 specimens from five animal species (dog, cat, sheep, cow, and pig) were received and tested for rabies. Of these numbers, 208 (94.9 %) were from domestic dogs, 5 (2.3%) from cats, from sheep 2(0.9%), from cow 3 (1.4%) and 1 (0.5%) from pig. A total of 136 (62.1%) of all samples submitted were confirmed positive. Of the 136 positive samples, 131 (96.3%) were from domestic dogs. As part of the laboratory procedures, 593 mice were used to inoculate 77 samples. All the samples tested by this method were negative for rabies virus. Detail of samples analyzed are presented in table 1.

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Table 1: Distribution of samples submitted for Rabies diagnosis in 2021

State	Canine		Feline		Ovine		Bovine		Porcine		Total
	+ve	-ve	+ve	-ve	+ve	-ve	+ve	-ve	+ve	-ve	
Akwa Ibom		1									1
Bauchi	12	1			1	1					15
Bayelsa	1										1
Benue	5										5
Delta	1	1									2
Ebonyi	1										1
Ekiti									2		2
FCT	2			1							3
Gombe	1	1									2
Imo	1										1
Kaduna	6	2									8
Kano	12	5	1					1			19
Katsina	1										1
Kebbi	2										2
Kwara		1									1
Nassarawa		1									1
Niger	1										1
Osun	1										1
Plateau	84	64	2	1						1	152
TOTAL	131	77	3	2	1	1	1	2		1	219

Key: +ve – Positive  
-ve – Negative

### ii) Research

The process of raising rabies hyper-immune serum in rabbits for research, diagnosis and possible future commercial scale, which commenced in 2020 is in progress.

### iii) Analysis of student's project samples/Bench space

The laboratory assisted three students in the analysis of some samples as part of a research project for the award of Higher National Diploma (HND) in the Federal College of Animal Health and Production Technology (FCAH&PT) Vom. The analysis was conducted on 150 dog brain samples using the fluorescent antibody test (DFAT).

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## 1. Achievements

### I). Human anti-rabies pre- and post-exposure prophylaxis:

As part of ensuring the safety of persons at risk of working with biohazards, the Laboratory facilitated the vaccination of ten personnel working in the Division.

### II). Conferences/Seminar/workshops attended

Staff of the Laboratory attended the following conferences/training/workshops:

- i. Nigeria Veterinary Medical Association 57<sup>th</sup> National Conference (Edo, 2021) held from 25 to 29 October, 2021 at Haratio Marque, Okada Avenue GRA, Benin City Edo State. Theme: The Veterinarian and Global Health Security.
- ii. The 7<sup>th</sup> International Conference on Rabies in West Africa (RIWA) - SIERRA LEONE VIRTUAL MEETING, held from 3<sup>rd</sup> – 6<sup>th</sup> May 2021. theme: “Is the Global Goal of Rabies Elimination by 2030 Achievable in Africa in General and West Africa in Particular Within the Current Landscape of Policy and Prevention Strategies, Complicated by COVID-19 Pandemic”
- iii. Training on Quality Management System, held at Dermatophilosis Conference Hall, from 5<sup>th</sup>-7<sup>th</sup> August, 2021
- iv. Association of Medical Laboratory Scientists of Nigeria (AMLSN) National Conference/ Continuing Professional Development (CPD) Workshop; theme: The Medical Laboratory Preparedness For The Next Pandemic; Venue: Yenagoa Bayelsa State; Date: 8<sup>th</sup>- 12September, 2021
- v. Association of Medical Laboratory Scientists of Nigeria (AMLSN) Plateau State Branch Workshop/ Continuing Professional Development (CPD); Theme: The Fundamentals of Research and Publication; The Place of Medical Laboratory Scientist. Date: 6<sup>th</sup>- 9<sup>th</sup> July, 2021; Participation; Virtual.
- vi. Nigerian Biological Safety Association (NIBSA): Foundation Biorisk Management Training; Venue; Dermatophilosis Conference Hall N.V.R.I Vom; Date 2<sup>nd</sup> -3<sup>rd</sup> August, 2021
- vii. One Health Seminar; theme; Institutionalizing the One Health Concept and Tripartite Joint Risk Assessment Tool; Venue; Quality Control Conference Hall N.V.R.I Vom; Date; 5<sup>th</sup> September, 2021

## 2. Major Challenges

- i. The laboratory is operating in a temporary facility, hence the space is inadequate, electricity supply is erratic which was attributed to faulty wiring.

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- ii. Equipment needed for research and prompt diagnosis are lacking
- iii. Storage facilities like Ultra-Low freezer (-80°C), refrigerated centrifuge (+4°C), Biosafety cabinet class II, Carbon dioxide (CO<sub>2</sub>) Incubator (+37°C) and Deep freezers (-20°C) are in short supply
- iv. Non-availability of panel of monoclonal antibody to Nigerian isolates of rabies virus is also limiting our capacity to characterized rabies viruses from Nigeria.

### **Future Plans**

1. To replace the Mouse Inoculation test (MIT) with rabies tissue culture isolation test (RTCIT) using BHK or Murine neuroblastoma cell lines for isolation of rabies and related viruses, in order to conform to international standards; hence the need for the equipments listed in item 4 D,E and F above.
2. Seek the Institute's approval for funds to acquire a panel of monoclonal antibody (MAb) to Nigerian isolates of the rabies virus. This is meant for antigenic typing of available rabies and related virus isolates in the archive of laboratory and as services to research community and the teeming clients of the Institute.
3. Submission of proposal to the institute on a survey of rabies and/or related viruses in bats, rodents and wildlife that are incriminated in the epidemiology of rabies in Nigeria.



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## REGIONAL LABORATORY FOR ANIMAL INFLUENZA AND OTHER TRANSBOUNDARY ANIMAL DISEASES (TADs)

### Mandate of the Laboratory

The Regional Laboratory is saddled with the following responsibilities: -

1. Diagnosis and research into avian diseases notably Newcastle disease virus, avian influenza virus, Infectious bursal disease virus, and Infectious bronchitis.
2. Preparation of viral transport media, antisera and antigens,
3. Quality control assessment of avian viral vaccines,
4. Field assessment of NVRI avian viral vaccines through seromonitoring of vaccinated flocks
5. Participating in national surveillance of avian influenza.
6. Participating in national and international networks and surveillance for Emerging infectious/zoonotic/transboundary diseases
7. Rendering support to other West African Laboratories, as the Regional Reference Laboratory for Animal Influenza
8. Reference lab for West Africa Health Organization (WAHO)

### Laboratory Activities from January to December, 2021

The laboratory was actively involved in the molecular testing/diagnosis of COVID-19 pandemic with over 38,000 samples tested from 5 Northern States in Nigeria. The results were promptly dispatched within the stipulated turnaround time. The laboratory also carried out its mandate which involved the routine diagnosis and passive surveillance of avian influenza, Newcastle disease, Infectious bursal disease and fowl pox. The table below shows the summary of samples received for 2021

Summary of samples received and processed in 2021

Number of samples tested				Number positive			
AIV*	NDV <sup>§</sup>	IBDV <sup>φ</sup>	RHDV	AIV	NDV	IBDV	RHDV
<b>680</b>	<b>536</b>	<b>153</b>	<b>11</b>	<b>308</b>	<b>48</b>	<b>9</b>	<b>2</b>

\*=avian influenza virus <sup>§</sup>=Newcastle disease virus <sup>φ</sup>= infectious bursa disease virus  
RHDV=Rabbit hemorrhagic disease virus

In the drive to fulfill our mandate the Division conducted field assessment of NDV vaccines through seromonitoring of vaccinated flocks. A total of 2158 sera samples were screened for sero conversion. The results were communicated to the farmers for necessary action either to administer a booster dose or treat for ongoing infection in the farm.

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## Other Notable Activities

1. The division completed the first phase of the collaboration with CDC Atlanta/Nigeria and NCDC, FELTP on ecological surveillance of monkeypox disease in animals
2. COVID-19 diagnosis and testing of human samples was conducted
3. Production of Virus transport media (VTM) for COVID-19 sample collection/public health intervention
4. The Division participated in the follow-up audit towards accreditation for testing laboratories with support from the West Africa Health Organization (WAHO)
5. Participation in national surveillance for Rabbit Hemorrhagic Disease by REDISSE
6. Participation in LIDISKI project on Newcastle disease virus

## Achievements

1. Provision of diagnostic support for animal influenza and other avian diseases.
2. Molecular diagnosis of COVID-19 in Nigeria (over **12,054 samples analyzed**)
3. Staff of the Laboratory published research articles in peer review journals and also made conference presentations within and outside the Country
4. Documentation activities towards ISO17025 accreditation

## Challenges

1. The batteries of the inverter can no longer hold charges for long time; hence this affects the PCR runs once there is power outage especially before the institutional generator comes on.
2. There is need for the calibration of our pipettes by specialized companies as precision and accuracy is being affected

## Future Plan

1. Active surveillance for highly pathogenic avian influenza virus in live bird markets continues. This on-going collection, collation and analysis of data from live bird market will help in the prevention of future outbreaks as suspected cases will be properly handled.
2. RHDV surveillance
3. Research and development of vaccine for the control of rabbit hemorrhagic disease
4. Strengthening national and international networks and collaborations
5. Expansion of other R & D products and services including antivirals

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## VETERINARY EXTENSION SERVICES DIVISION

### Functions/mandate

The Division was created in 2020 and is saddled with the responsibility of transferring proven veterinary technologies from the Institute to the end-users. Information regarding solutions to health and production problems confronting livestock and poultry farmers are packaged and disseminated to farmers in easy to understand formats. A mechanism for receiving, analyzing and responding to questions and feedbacks from farmers is in place for prompt attention.

Overall, the focus of the activities of the Division is to reach out to livestock and poultry farmers with veterinary health care services. The Division also liaises with State Agricultural Development Project (ADPs) of all the thirty- six states and Abuja, for effective dissemination of proven technologies and obtaining feedback from farmers. The Division also conducts training of community animal health workers on some basic veterinary techniques.

Veterinary Extension activities are executed through:

A. Participation in extension and outreach meetings including:

- i). Monthly technology review meetings (MTRM)
- ii). Zonal Steering committee and Zonal technical committee meetings
- iii). National Annual Research Review Meeting
- iv). Research extension farmer input linkage system (REFILS) workshop

B. Publication (Electronic and Print)

C. Representing the Institute at Agricultural shows and Trade fairs

D. Organising Training workshops, Open days, and seminars

E. Stakeholder interactions

F. Outreach activities including Agricultural Research Outreach Centres (AROC)

G. Surveys (Thematic and General)

H. OFAR (On-Farm-Adaptive-Research Trials)

### Notable activities

- Carried out vaccinations in the Institute adopted villages.
- Production of 52 episodes each of Muleka rugage, Ahu ike umu anumanu/Pidgin English and Yoruba.
- Organized refresher training course for Community Animal Health Workers from Kano and Nasarawa State.
- Participation in the MTRM hosted by Plateau State Agricultural Development Programme.

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- Attended the 2021 Annual National Agricultural Extension Review and Planning Meeting (NAERPM) held at the National Agricultural Extension and Research Liaison Services, Zaria.
- Attended Zonal Steering Committee meeting in Kwara State
- Visitation to some private Radio stations in order to give the kiss of life to the extension radio programmes that had been suspended for some years.
- Participation in the LIDISKI (Livestock Disease Surveillance Knowledge Integration) in areas of advocacy, data collection, extension services, and capacity building for biostatistics, participatory approaches and socio-economics.
- Participation in the EU-FMD Project [The role of small ruminants in the endemicity of Foot and mouth disease (FMD)] in areas of advocacy, sample collection and extension services (particularly amongst Pastoralists). The ongoing study is on
- Participation in On-farm Adaptive Research (field trial) of Trivalent Foot and Mouth Disease Vaccine.
- Participated in the World Food Day/ National Agricultural Show organized by the Federal ministry of Agriculture and Rural Development in conjunction with Nasarawa State Govt. and FAO.

### Achievements

- Successful vaccination of local chicken against Newcastle disease virus in six (6) adopted villages with Thermo-stable Newcastle disease vaccine (ND<sup>1</sup>/<sub>2</sub>).
- Vaccination of cattle against Lumpy skin disease in five (5) adopted villages with Lumpy skin disease vaccine.
- Successfully trained Community Animal Health Workers (CAHWs) on identification of livestock and poultry diseases, treatment and vaccination for 36 and 33 participants from Kano and Nasarawa State respectively in collaboration with International Committee of Red Cross (ICRC).
- Twelve episodes each of Muleka rugage and Ahu ike umu anumanu/ pidgin English has been produced by the Division.
- Participated in Research Exhibition organized by Nasarawa State University, Keffi and came first. Prizes were won – 52 inches LG Television and Photocopying machine.
- Created Photo database.
- Successful completion of the project ‘Digitalization of veterinary extension services’ was carried in the nine Propcom States (Adamawa, Bauchi, Borno, Gombe, Jigawa, Kaduna, Kano, Taraba, and Yobe State)’.
- Meetings (National and Zonal) were attended at Zaria (Kaduna State) and Ilorin (Kwara State)

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## Challenges

- Insecurity hampered our movements and access to some communities
- Paucity of funds.
- Lack of extension equipment/facilities (recording studio, cameras, decoder and public addressing system (PAS), printer and photocopying machine and Laptop computer)

## List of publications (Extension Publications)

- ❖ Dairy herd health management ----- in print
- ❖ Know your NVRI vaccines ----- in print

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## VETERINARY PATHOLOGY DIVISION

### Introduction:

The Division is organized into the following section: - Reception, Necropsy, Histopathology, Laundry and Incineration for effective service delivery. Activities of the Division are geared towards fulfilling the institute's mandate on surveillance, diagnosis and control of livestock and poultry diseases. The Division serves as a National and Regional Laboratory for Avian Influenza and other trans-boundary animal diseases for West and Central Africa.

### FUNCTIONS

The activities of the division are organized, coordinated and executed in line with international best practice in order to maintain standard and met customer satisfaction. Generally, the functions of the division are carried out as outlined:

1. Receive and document all cases / samples coming into N.V.R.I. Vom and give an identification /tracking number to each sample and dispatch of same to appropriate laboratory for action.
2. Conduct surveillance and diagnosis of diseases (emerging and re-emerging) within the nation and sub region as the situation may demand.
3. Report all notifiable diseases diagnosed immediately to the Director and CEO of N.V.R.I., Director Diagnostic Services NVRI, Public health and epidemiology division, NVRI and Chief Veterinary Officer of the nation.
4. Constitute a team for field outreach on any animal disease outbreak.
5. The division is also saddled with ambulatory services to Livestock and poultry farms and wild life parks.
6. Provide professional advice to livestock and poultry farmers based on cases /complaints received.
7. Training of manpower to cater for the division and other agencies.

### Specific functions of the Units of the Division

#### Reception Unit:

- ✓ All samples/carcass for diagnosis or research in the Institute are received and documented at the reception unit in Veterinary Pathology Division where a tracking number is assigned and documented.
- ✓ Disseminate results to appropriate bodies/ units for action.
- ✓ A total of one thousand one hundred and fourteen (1414) cases were received and documented during the period under review.

#### Necropsy Unit:

- ✓ Conduct ante and post-mortem examination on animals/carcass using gross pathology, microscopy and immune-histochemical tools in order to make a diagnosis.
- ✓ Produce interim reports of diagnosed cases within 24 hours of examination and a final report as soon as possible upon receipt of ancillary laboratory results.

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- ✓ Advice farmers/clients on possible treatment and control measures for diagnosed diseases.

### Histopathology Unit:

- ✓ Produces histological slides for viewing to give a microscope view of the gross lesion observed during postmortem examination. The production of slides takes minimum of 6 days to produce to and diagnosis.

### Incinerator Unit:

- ✓ This Unit provides services for the safe disposal of wastes generated in laboratories, clinics etc. It renders services to all the laboratories in the Institute as well as some agencies in the Plateau State Ministry of Health/World Health Organization. An estimates 26,890.4kg of wastes was incinerated during the period under review.

### Laundry Unit:

- ✓ This unit washes all scrub suites and laboratory coats used for necropsy and other laboratories.

**Table 1. NUMBER OF CASES RECEIVED FROM JANUARY TO DECEMBER 2021**

S/NO	ANIMAL SPP/SAMPLE TYPE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
1.	Avian	22	67	101	52	46	46	92	90	57	49	40	41	703
2	Bovine	6	6	5	14	7	7	6	10	15	11	7	16	110
3	Canine	14	12	23	17	19	19	17	26	23	23	17	21	231
4	Caprine	1	1	7	0	8	8	7	7	7	4	4	3	57
5	Crustaceans (crab)	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Equine	1	2	0	0	2	2	1	2	2	0	0	0	12
7	Feline	0	1	0	1	0	0	0	1	2	1	0	1	7
8	Humans	0	0	0	1	0	0	1	2	4	1	0	0	9
9	Laprine	2	2	6	4	3	3	5	4	16	4	0	2	51
10	Ovine	1	0	4	5	2	2	4	8	9	1	2	2	40
11	Porcine	8	8	13	6	11	11	42	13	23	9	4	2	150
12	Pisces (fish)	1	0	0	0	0	0	1	1	1	0	1	0	5
13	Plates	0	0	0	0	2	2	1	0	1	0	1	0	7
14	Water	1	0	0	0	1	1	0	1	0	1	2	1	8
15	Wildlife	0	0	0	0	0	0	0	1	0	1	0	0	2
16	Feeds	0	0	0	2	2	2	2	1	3	0	1	0	13
17	Eggs	0	1	0	0	0	0	0	0	1	0	0	0	2
18	Vaccines	0	0	0	0	0	0	1	0	1	0	0	0	2
19	Broths	0	0	0	0	0	0	2	0	0	1	0	0	3
20	Soil	0	0	0	0	0	0	0	0	0	0	1	0	1
21	Drugs	0	0	0	0	0	0	0	0	0	0	1	0	1
	Grand total													1414

**Table 2. DISEASES DIAGNOSED FROM JANUARY TO DECEMBER 2021**

S/NO	ANIMAL SPP/DISEASES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
A	<b>AVIAN</b>													
1	Coccidiosis	14	25	24	18	14	24	19	21	1	25	11	9	205
2	Colibacillosis	9	10	22	11	10	14	11	13	7	16	6	6	135
3	Salmonellosis	0	3	4	1	3	3	2	2	5	0	2	0	25
4	Helminthosis	2	6	4	0	2	4	3	2	2	3	2	1	31
5	IBD	1	0	1	1	1	1	1	0	0	3	3	0	12
6	Klebsiellosis	1	2	1	0	0	0	0	0	0	2	0	0	6
7	Bacterial infection	2	1	2	2	1	5	2	2	1	4	0	0	22

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8	Research work	0	0	1	0	0	1	1	2	0	0	0	0	5
9	Haemoparasitism	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Hypoproteinemia	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Seromonitoring	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Mucormycosis	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Avian influenza	2	21	35	19	3	7	48	48	28	17	12	24	264
14	Streptococcosis	1	0	0	0	0	0	0	0	0	0	0	0	1
15	Parasitiasis	1	0	0	0	0	0	0	1	0	0	0	0	2
16	Staphylococcosis	1	1	1	0	2	5	0	1	3	3	1	1	19
17	New castle disease	0	1	3	9	3	0	4	2	1	1	3	0	27
18	Colisepticaemia	0	0	0	0	0	0	3	0	1	0	4	1	9
19	Mareks	0	0	0	0	1	0	1	0	0	0	0	0	2
20	Stampede	0	0	0	1	0	0	1	0	0	0	0	0	2
21	Management problem	0	0	0	0	0	0	1	0	0	0	1	0	2
22	Aeromoniasis	0	0	0	1	0	1	1	0	0	3	0	0	6
23	Bacillus infection	0	0	0	0	0	0	0	1	1	0	1	0	3
24	Enterobacteriosis	0	0	0	0	0	1	0	1	1	0	0	1	4
25	Aspergillosis	0	0	0	0	0	0	0	0	1	0	0	0	1
26	Ascariidosis	0	1	0	0	0	1	1	0	2	0	0	0	5
27	Pseudomoniasis	0	0	2	0	0	0	0	0	0	1	1	0	4
28	Heat stroke	0	0	0	1	0	0	0	0	0	0	0	0	1
29	Citrobacter infection	0	0	0	2	0	0	0	0	0	1	1	0	4
30	Fatty liver haemorrhagic syndrome	0	0	0	1	0	0	0	0	0	0	0	0	1
31	Gardiosis	0	0	0	0	0	0	0	0	0	2	0	0	0
<b>B</b>	<b>CAPRINE</b>													
1	Coccidiosis	0	0	2	0	2	2	1	1	0	0	0	0	8
2	Babesiosis	0	0	1	0	0	0	0	0	0	0	0	0	1
3	Theileriosis	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Mycoplasmosis	0	0	0	0	0	0	0	0	0	0	0	0	0
5	PPR	0	1	2	0	0	6	2	0	2	2	0	0	15
6	Colibacillosis	0	0	0	0	0	1	0	0	0	0	0	0	1
7	Haemoparasitism	0	0	0	0	0	0	2	0	0	0	0	0	2
8	Helminthosis	1	0	1	0	1	0	0	0	1	0	2	0	6
9	Aeromoniasis	0	0	0	0	0	0	1	2	0	0	0	0	3
10	Research work	0	0	0	0	0	0	0	0	1	0	0	0	1
11	Contagious ecthyma	0	0	0	0	0	0	0	1	0	0	0	0	1
12	Aspergillosis	0	0	0	0	0	0	0	1	0	0	0	0	1
13	Rabies	0	0	1	0	0	0	0	0	0	0	0	0	1
14	Staphylococcosis	0	0	1	0	1	0	0	0	0	0	0	0	2
15	Lousiness	0	0	0	0	0	0	0	0	0	0	1	0	1
16	Haemonchosis	0	0	0	0	0	0	0	0	0	0	1	1	2
<b>C</b>	<b>OVINE</b>													
1	Mastitis	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Klebsiellosis	0	0	0	0	0	0	0	0	1	0	0	0	1
3	Anaplasmosis	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Babesiosis	0	0	0	1	0	0	0	0	0	0	0	0	1
5	Mycoplasmosis	0	0	0	0	0	0	0	0	0	0	0	0	0
6	PPR	0	0	0	1	0	0	0	0	1	0	0	0	2
7	Brucellosis	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Bacterial septicaemia	1	0	0	1	0	1	0	0	1	0	0	0	4
9	Helminthosis	0	0	0	0	0	1	1	2	3	0	0	1	8
10	Haemoparasitism	0	0	1	0	0	0	1	0	0	0	0	1	3
11	Pneumoniasis	0	0	0	0	0	0	0	1	0	0	0	0	1
12	Coccidiosis	0	0	1	0	0	0	0	2	1	0	0	0	4
13	Haemonchosis	0	0	0	0	0	0	0	3	0	0	0	0	3
14	Piroplasmosis	0	0	0	0	0	0	0	2	0	0	0	0	2
15	Staphylococcosis	0	0	0	0	0	0	0	1	0	0	0	0	1
16	Colibacillosis	0	0	0	0	0	0	0	0	1	0	0	0	1
17	Dermatophyllosis	0	0	0	0	0	0	0	0	1	0	0	0	1
18	Rabies	0	0	0	1	0	0	0	0	0	0	0	0	1
19	Choke	0	0	0	1	0	0	0	0	0	0	0	0	1
20	Sheep pox	0	0	1	0	0	0	0	0	0	0	0	0	1



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21	Organophosphate poisoning	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>D PORCINE</b>														
1	Research work	1	0	0	0	0	0	0	0	0	0	0	0	1
2	ASF	2	0	3	1	6	3	25	9	16	0	0	0	65
3	Coccidiosis	3	1	1	3	3	1	0	0	0	0	0	0	12
4	Aeromoniosis	0	0	1	0	0	0	0	0	0	0	0	0	1
5	Aspergillosis	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Colibacillosis	0	2	2	1	0	3	2	0	1	1	0	0	12
7	Helminthosis	0	1	2	0	0	1	1	1	0	0	0	0	6
8	Bacterial septicaemia	1	1	0	2	0	0	1	0	0	0	0	0	5
9	Colisepticaemia	0	0	0	0	0	0	1	0	0	0	1	0	2
10	Bacterial infection	0	0	0	0	0	0	1	0	0	0	0	0	1
11	Staphylococcosis	0	1	2	0	0	1	1	0	0	0	0	0	5
12	Haemoparasitiasis	0	0	0	0	0	0	0	1	0	0	0	0	1
13	Babesiosis	0	0	0	0	0	0	0	1	0	0	0	0	1
14	Trypanosomosis	0	0	0	0	0	0	0	1	0	0	0	0	1
15	Eperythrozoonosis	0	0	0	0	0	0	0	1	0	0	0	0	1
16	Klebsiellosis	0	0	1	0	0	0	0	0	1	0	0	0	2
17	Ascariodiosis	0	0	1	0	0	0	0	0	0	0	0	0	1
18	Piroplasmosis	0	0	0	1	0	0	0	0	0	0	0	0	1
<b>E BOVINE</b>														
1	Helminthosis	0	1	1	1	2	2	0	3	0	1	0	1	12
2	Cocidiosis	0	0	1	2	2	2	0	1	0	0	0	0	8
3	Haemoparasitiasis	2	0	0	0	0	0	0	0	0	1	0	0	3
4	Anaplasmosis	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Theileriosis	0	0	0	0	0	0	0	0	0	0	0	0	0
6	CBPP	0	0	1	3	1	1	0	1	2	0	0	3	12
7	Ectoparasitiasis	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Bacterial septicaemia	3	0	0	1	0	0	0	0	0	0	0	0	4
9	Piroplasmosis	1	3	3	5	5	0	1	1	3	1	0	3	26
10	Brucellosis	1	0	0	0	0	0	0	0	0	0	0	0	1
11	Colibacillosis	0	0	0	0	0	0	1	0	0	0	0	0	1
12	Lumpy skin disease	0	0	0	0	0	0	1	0	3	0	0	0	4
13	Staphylococcosis	0	0	0	0	0	0	1	0	2	0	0	0	3
14	Food and mouth disease	0	0	0	0	0	0	0	0	1	1	0	0	2
15	Dermatophylosis	0	0	1	0	0	0	0	2	0	0	0	0	3
16	Parasitiasis	0	0	0	2	1	0	0	0	0	0	0	0	3
17	Klebsiellosis	0	0	0	1	1	0	0	0	0	0	0	0	2
18	Rabies	0	0	0	1	0	0	0	0	0	0	0	0	1
19	Clostridia infection	0	0	0	0	0	1	0	0	0	0	0	0	1
20	Leptospirosis	0	0	0	1	0	0	0	0	0	0	0	0	1
21	Candidiasis	0	0	0	0	0	0	0	0	0	1	0	0	1
<b>F CANINE</b>														
1	Rabies	8	7	10	6	9	8	10	17	16	15	10	13	129
2	Klebsiellosis	0	0	0	1	0	0	0	1	0	0	1	0	3
3	Staphylococcosis	0	0	1	0	0	0	0	0	0	0	0	1	2
4	Research work	0	0	1	0	0	0	0	1	0	0	0	0	2
5	Colibacillosis	0	0	0	3	0	1	1	0	0	0	0	0	5
6	Haemoparasitism	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Bacterial septicaemia	1	0	1	0	0	0	0	0	1	0	1	0	4
8	Brucellosis	1	0	0	0	0	0	2	0	0	0	0	0	3
9	Helminthosis	0	0	0	0	0	0	1	0	0	1	0	0	2
10	Aeromoniasis	0	0	0	1	0	0	0	1	0	0	0	0	2
11	Kola nut toxicity	0	0	0	0	0	0	0	0	1	0	0	0	1
12	Leptospirosis	0	0	0	0	0	0	0	1	0	0	1	0	2
13	Bacillus infection	0	0	0	1	0	0	0	0	0	0	0	0	1
14	Piroplasmosis	0	0	0	1	3	1	0	0	0	1	0	0	6
15	Coccidiosis	0	0	0	2	2	0	0	0	0	0	1	0	5
16	Proteus infection	0	0	0	1	0	0	0	0	0	0	0	0	1
17	Citrobacter infection	0	0	1	0	1	0	0	0	0	0	0	0	2

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18	Tumor	0	0	0	0	0	1	0	0	0	0	0	1
19	Streptomyces	0	0	0	0	0	0	0	0	0	1	0	1
20	Toxocarosis	0	0	0	0	0	0	0	0	1	0	0	1
21	Starvation	0	0	0	0	0	0	0	0	0	1	0	1
22	Mucortoxicosis	0	0	0	0	0	0	0	0	0	0	1	1
23	Yersiniosis	0	0	0	0	0	0	0	0	0	0	1	1
<b>G</b>	<b>PISCES</b>												
1	Coccidiosis	1	0	0	0	0	0	0	0	0	0	0	1
2	Bacterial septicaemia	1	0	0	0	0	0	1	0	0	0	0	2
3	Klebsiellosis	0	0	0	0	0	0	0	0	0	0	0	0
4	Research work	0	0	0	0	0	0	0	0	0	1	0	1
5	Schistosomiasis	1	0	0	0	0	0	0	0	0	0	0	1
6	Streptococcosis	0	0	0	0	0	0	1	0	0	0	0	1
7	Advanced autolysis	0	0	0	0	0	0	0	1	0	0	0	1
<b>H</b>	<b>LAPRINE</b>												
1	Coccidiosis	0	2	2	1	3	2	2	0	2	1	0	16
2	Research work	0	0	1	0	0	0	0	2	5	0	0	9
3	Colibacillosis	1	0	1	1	1	1	0	0	2	0	0	
4	Klebsiellosis	0	0	0	1	1	0	0	0	0	0	0	2
5	Parasitiasis	1	0	1	1	1	0	0	0	0	0	0	4
6	Staphylococcosis	0	0	0	1	1	0	1	0	0	0	0	3
7	Rabbit hemorrhagic disease	0	0	0	0	0	0	1	1	0	0	0	2
8	Helminthosis	0	1	1	0	3	0	0	1	2	0	0	8
9	Bacterial septicaemia	0	0	1	0	0	0	0	1	0	0	0	2
10	Aeromoniasis	0	0	0	0	0	0	0	0	1	0	0	1
11	Hepatotoxicity	0	0	0	0	0	0	0	0	2	1	0	3
12	Advanced autolysis	0	0	0	0	0	0	0	0	1	0	0	1
13	Citrobacteriosis	0	0	0	0	1	0	0	0	0	0	0	1
14	Bacillus infection	0	0	0	0	0	1	0	0	0	0	0	1
15	Bacterial infection	0	0	0	0	0	0	0	0	0	1	0	1
<b>I</b>	<b>WATER</b>												
1	Heavy metals analysis(arsenicosis)	0	0	0	0	0	0	0	0	0	0	0	0
2	Aeromoniasis	0	0	0	0	0	0	0	1	0	0	0	1
3	Colibacillosis	0	0	0	0	1	1	0	0	0	0	0	2
4	Klebsiellosis	0	0	0	0	0	0	0	0	0	1	0	1
<b>J</b>	<b>PLATES</b>												
1	Bacillus identification	0	0	0	0	0	0	0	0	0	0	0	0
2	Bacterial contamination	0	0	0	0	0	0	0	0	1	0	0	1
3	Colibacillosis	0	0	0	0	0	1	0	0	0	0	0	1
<b>K</b>	<b>EQUINE</b>												
1	Bacterial septicaemia	1	1	0	1	0	0	0	0	0	0	0	3
2	Mucormycosis	0	0	0	0	0	0	1	0	0	0	0	1
3	Salmonellosis	0	0	0	0	0	0	0	1	0	0	0	1
4	Haemoparasitiasis	0	1	0	0	0	0	0	1	0	0	0	2
5	Staphylococcosis	0	0	0	0	0	0	0	0	1	0	0	1
6	Brucellosis	0	0	0	0	0	1	0	0	0	0	0	1
7	Piroplasmosis	0	0	0	0	0	1	0	0	0	0	0	1
<b>L</b>	<b>FEEDS</b>												
1	Mucormycosis	0	0	0	0	0	0	1	0	0	0	0	1
2	Klebsiellosis	0	0	0	1	1	0	0	1	0	0	0	3
3	Aspergillosis	0	0	0	0	0	0	0	0	1	0	0	1
4	Proximate analysis	0	0	0	1	0	1	0	0	0	0	0	2
5	Colibacillosis	0	0	0	1	0	2	0	0	0	0	0	3
6	Bacterial infection	0	0	0	0	1	0	0	0	0	0	0	1
7	Streptococcosis	0	0	0	0	1	0	0	0	0	0	0	1
8	Staphylococcosis	0	0	0	0	0	1	0	0	0	0	0	1

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9	Aeromoniasis	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>M</b>	<b>FELINE</b>													
1	Bacterial infection	0	0	0	0	0	0	1	0	0	0	0	0	1
2	Staphylococcosis	0	0	0	0	0	0	0	1	0	0	0	0	1
3	Bacillus infection	0	0	0	0	0	0	0	0	1	0	0	0	1
4	Rabies	0	0	0	1	0	0	0	0	1	0	0	1	3
5	Coccidiosis	0	0	0	0	0	0	0	0	0	1	0	0	1
<b>N</b>	<b>BROTHS</b>													
1	Bacterial infection	0	0	0	0	0	0	1	0	0	0	0	0	1
<b>O</b>	<b>HUMANS</b>													
1	Bacterial septicaemia	0	0	0	0	0	0	0	1	0	0	0	0	1
2	Granuloma	0	0	0	0	0	0	0	0	1	0	0	0	1
<b>P</b>	<b>WILD LIFE</b>													
1	Helminthosis	0	0	0	0	1	0	0	0	0	0	0	0	1
2	Parasitiasis	0	0	0	0	1	0	0	0	0	0	0	0	1
3	Tumor	0	0	0	0	0	0	0	0	0	1	0	0	1
<b>Q</b>	<b>DRUGS</b>													
1	Drug sensitivity	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>R</b>	<b>PLANTS</b>													
1	Bacterial contamination	0	0	0	0	0	0	0	0	0	0	1	0	1
	<b>Grant total</b>													<b>1412</b>

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**Table 3. Histology slides processed from January to December 2021.**

S/No	ORGANS	Total
1	Liver	435
2	Kidney	266
3	Brain	202
4	Intestine	334
5	Skin	57
6	Bone	58
7	Heart	290
8	Spleen	264
9	Pancreas	71
10	Skeletal muscle	57
11	Testis	81
12	Omentum	1
13	Lung	138
14	Thymus	75
15	Bursa of fabricious	37
16	Tumor tissue/Growth (Human)	2
17	Egg follicle	28
18	Bladder	1
19	Eye	54
20	Prostate gland	1
21	Proventriculus	1
22	Lymph node	12
23	Gills	27
25	Caecal tonsil	22
26	Rectum	8
27	Fallopian tube	5
28	Thyroid gland	53
29	Stomach	42
30	Mammary gland	1
31	Sciatic nerve	25
32	Tonsil	3
32	Trachea	22
33	Ear lobe (human)	1
	<b>Total</b>	<b>2617</b>

**Tables 4: INCINERATION WASTE REPORT FROM JANUARY – DECEMBER, 2021**

LABORATORY/UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL (kg)
NECROPSY	238.2	377	185.9	245.9	515.7	381.9	541.3	1099.7	1218.8	228.2	280.1	640.1	5,952.8
RABIES	32.1	28.9	21.1	34	48.4	58.5	83.4	139.6	151.4	60.8	85.3	70.9	814.4
VIR. VAC. PROD	0	888	524	233	427.4	924	890.2	2124.6	1949.1	1359.8	2072	1008.7	12,400.8
BACT. RES. DIV.	34.9	41.8	50	46.5	78.4	74.8	47.1	58.6	67.2	53.7	59.4	77.1	689.5
DRUG/DEV	0	0	0	0	0	0	0	0	0	0	0	0	0
REG. LAB.	0	0	19	52.6	64.9	153.8	80.7	137.4	80	60.3	169.3	122.5	940.5
VRD	7.6	0	7.3	0	0	0	0	0	0	0	0	13.6	28.5
MYCOLOGY	6.2	3.6	9.6	10.8	29.1	12.1	9.7	25.3	29.6	12.8	6.2	0	155
C/PATH	1.5	0.5	1.7	1.9	6.7	0	0	2.9	10.3	0	0	0	25.5
COVID-19	150.8	191.9	87.4	26.9	0	0	0	0	0	0	0	0	457
HISTOPATH	6.8	9.6	31	7.6	8.9	2.7	0	0	4.8	0	0	11.4	82.8
PARA CDL	5.9	19.4	20.2	10.9	13.9	8	9.2	7.3	4.30	17.1	11.3	0	127.5

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BACT. CDL	61.8	42.8	42.5	48.7	125.3	99.1	67.6	183.3	150.4	168.6	120.3	28	1,138.4
Q/C	0	0	0	11.3	0	15.9	0	14.2	0	0	0	0	41.4
BIO-TECH	44.4	65.8	44.4	76.9	58.3	88.6	157.4	43.6	39.7	25.3	39.7	56.8	740.9
UNKNOWN	194.5	70	83.7	101	144.6	120.8	146.2	203.3	294.2	168.4	109.8	272.5	1,909
CDL DEPARTMENT	43.7	28.6	46	30.9	79.7	32.9	33.9	79.4	42.8	58.2	99.5	72.4	648
FMD	0	0	0	0	0	0	0	0	0	0	0	0	0
BIO-CHEM	0	0	0	0	0	9.8	7.2	0	6.4	0	0	0	23.4
DAG/FARM	0	0	0	0	0	0	0	0	0	0	0	0	0
FIELDWORK	0	0	0	0	0	0	0	0	0	0	0	0	0
VET CLINIC	0	23	0	0	0	0	0	0	0	0	0	0	23
SIDE LAB.	0	0	0	8.9	8	7.6	10.4	0	0	0	0	143	177.9
POULTRY	0	4	0	0	0	0	0	0	0	0	0	0	4
CENTRAL STORES	193.3	0	0	0	0	203.4	0	0	0	0	0	0	396.7
EXTENSION	0	0	0	11.7	0	0	0	0	0	0	0	0	11.7
DERMATOPHYLOSIS	0	0	0	0	0	0	0	0	0	0	0	24.6	24.6
BSL 3 LAB	0	0	0	0	0	0	0	21.1	0	0	0	0	21.1
DIR ( SP. DUTY)	0	0	0	0	0	0	0	0	0	0	56	0	56
TOTAL	1,021.7	1,794.9	1,173.8	959.5	1,609.3	2,193.9	2,083.3	4,140.3	4,049	2,213.2	3,108.9	2,541.6	26,890.4

All figures in kilogram's (Kg)

# NVRI 2021 ANNUAL REPORT

## CHALLENGES

1. The staff of this division work sometimes late into the night but have not received any reward or letters of commendation to encourage them despite the prevailing insecurity.
2. Inadequate numbers of requisite staff. Additional 3 veterinary pathologists and 5 Livestock attendants is needed.
3. None availability of consumables such as samples bottles, Universal bottles, hard gloves, nose mask, (protective kits) detergents, absolute alcohol, formalin, zylene, Hematoxylin and Eosin stains etc affects good sample collection and sample processing.
4. Frequent breaking down of the incinerator has caused a lot of health challenge to the staff in the division. As materials awaiting incineration especially vaccine eggs get piled up because the incineration machine has broken down and awaiting finance to get it fixed.
5. Non availability of a cold room (+2 - +5°C) as part of the Post-Mortem facility for the preservation of carcasses and tissue samples.

## SUGGESTIONS ON THE WAY FORWARD:

1. Provision of industrial microscopes with camera to ease histological reading of histopathology slides in line with international practices.
2. Provision of laboratory consumables and laboratory protective wares.
3. Installation of cold room (+2 - +5°C) as part of the postmortem facility for the preservation of carcasses and tissue samples.
4. The incinerator need to be replaced with a new one as the current one is old (over 40years) and is gulping so much money for maintenance and an operation.
5. Cooperation of other laboratories to reduce turnaround time.

# NVRI 2021 ANNUAL REPORT

## VETERINARY PUBLIC HEALTH AND PREVENTIVE MEDICINE DIVISION

### Functions/Mandates of your division

Mandates of the division include:

1. Organizing and conducting disease surveys/ surveillance
2. Organizing and conducting disease monitoring and instituting control where and when needed
3. Monthly disease data collection, cleaning and presentation
4. Submission of monthly disease data collated/collected to appropriate authorities
5. Creation of a sustainable Animal Disease database of all animal diseases diagnosed in all the laboratories of the National Veterinary Research Institute, Vom
6. Disease modelling and forecasting, to aid the designing of cost effective disease control and prevention strategies
7. Outbreak investigations
8. Providing direction for future studies on animal diseases
9. Provision of evidence-based information to policy makers on animal disease control.

### Specific notable activities in the year 2021

In the outgoing year, the division was able to carry out the following activities:

1. Participated in survey of Newcastle Disease in birds in Plateau State
2. Participated in survey of Peste des Petits Ruminants (PPR) in small ruminants in Plateau State
3. Participated in immunosurveillance for seroconversion in small ruminants vaccinated with NVRI's PPR vaccines in some part of Adamawa State
4. Participated in immunosurveillance for seroconversion in large ruminants vaccinated with NVRI's CBPP vaccines in some part of Adamawa State
5. Collated and cleaned disease information submitted to CDL
6. Submitted on monthly basis disease reports to appropriate authorities
7. Creation of animal disease database for all animal species starting from 2001-2020
8. Trace back of records of disease diagnoses at the central diagnostic laboratory
9. Investigations on the distribution and spread of diseases of different animal species
10. Strategies for further disease investigations by states in the coming year.

### Achievements

In the outgoing year, the division was able to achieve the following:

1. Prompt submission of diseases reports monthly.
2. Creation of structures that make yearly data entry and access easier
3. Investigation-based evidence for research focus next year.

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## Challenges

1. Lack of dedicated vehicles for the disease surveillance/survey activities.
2. Lack of dedicated data collecting equipment and materials such as GPS readers, tablets/iPads, laptops, specialized epidemiological software etc
3. Lack of sufficient dedicated laptops.
4. Late release of laboratory reports on disease investigation and analysis
5. Shortage of trained staff.

## Future plan

In the coming year, the division hopes to embark on the following research activities:

- i) Further investigations on specific diseases common to each state down to the LGA level
- ii) Further investigations on the risk factors associated with disease of economic and public health importance
- iii) Disease mapping, modelling, and forecasting
- iv) Disease mitigation strategies.



# NVRI 2021 ANNUAL REPORT

## VIROLOGY RESEARCH DIVISION

### FUNCTION/MANDATES OF THE DIVISION

Research, surveillance and diagnosis of economically important viral disease of animals and development of vaccines and biologicals.

#### **Morbillivirus and related viruses laboratory**

##### **Specific activities**

- a. LIDISKI project on small ruminants for PPR surveillance/diagnosis.
- b. Proficiency test participation: CIRAD, France.

A total of nine hundred and fifty-one (951) tissue samples from the field were tested for PPR virus, number positive was three hundred and fifty (350) and number negative were one hundred and nine (109).

##### **Achievements**

- a. Successful completion of the LIDISKI project for the year 2021 surveillance/diagnosis of PPR in small ruminants.
- b. Successful completion of the cELISA Proficiency test from CIRAD, France.

#### **Avian diseases laboratory**

- a. Diagnosis of infectious bursal disease virus.

##### **Achievements**

- a. Successful completion of students projects for Masters level.
- b. Diagnosis of all samples sent to the lab for infectious bursal disease virus.

# NVRI 2021 ANNUAL REPORT

## Viral skin diseases research laboratory

The following samples were received and analyzed during the period under review

Disease	No. of samples	No. tested	No. positive
Lumpy Skin Disease	12	12	12
Sheeppox	8	8	5
Goatpox	17		
Contageous ecthyma (orf)	2	2	2
Bovine papiloma	0	0	0
Marek's disease	19	9	5
Chicken Infectious Anemia	0	0	0

### Achievements

#### a. Goat pox vaccine production

In collaboration with Viral Vaccine Production Division, 600 vials of goat pox vaccine were produced for field trial.

#### b. Field trial of goat pox vaccine

As part of field trials/studies before commercialization of the NVRI goat pox vaccine, goats at a commercial goat farm in Abuja were vaccinated with the vaccine in Sept 2021.

#### c. Field studies on NVRI Lumpy skin disease vaccine

In order to evaluate the efficacy and safety of NVRI Lumpy Skin disease vaccine, data were collected from cattle herds that were vaccinated in Bauchi and Plateau State. The Data is being analyzed.

Collectively, the sections in the division also received and trained students from different universities and colleges posted to the institute for SIWES.

### CHALLENGES

- Insufficient water supply
- Lack of basic cleaning reagents
- Faulty/broken down equipment e.g refrigerated centrifuge, Thermocycler, ELISA reader, ELISA washing machine, CO<sub>2</sub> incubator
- Insufficient laboratory consumables e.g Cell culture reagents and consumables

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## VIRAL VACCINES PRODUCTION DIVISION

### Introduction

The Division is saddled with the responsibility of producing vaccines for the prevention of livestock and poultry viral diseases of economic and/or public health importance in Nigeria and other West African countries.

In addition, the Division produces distilled water and cell and media for use of other Divisions within the institute. In view of the domiciliation of the Freeze Drying and Labeling Machines within the Division, it also renders services to other Divisions involved in the production of vaccines and other biologics.

The Viral Vaccine Production Division produces the following veterinary viral vaccines:

- i). Infectious Bursal Disease Vaccine or IBDV (Gumboro)
- ii). Fowl Pox vaccine (FPV)
- iii). Newcastle disease vaccines; La Sota, Hitchner B1-Intra-ocular, Komarov and Thermo-tolerant Newcastle disease vaccine (NDV I-2)
- iv). Peste des Petits Ruminants (PPR) vaccine
- v). Rabies vaccine for dogs (ARV)
- vi). Lumpy Skin disease (LSD) vaccine
- vii). Sheep/Goat Pox Vaccine (GPV)

### PRODUCTIONS:

The Division produced over twenty-three million (**23,307,550**) doses of the various veterinary viral vaccines between January and December, 2021. The details and the summary of vaccine production for the period under review are presented in Tables 1 and Table 2 respectively.

The Division also produced about **2000** litres of distilled and MilliQ water for its use and that of other Divisions in the Institute. Various cell culture media (GMEM, DMEM, HMEM, EMEM, RPMI, F-12, HBSS) and cell cultures in monolayer and suspension including Vero R133, CEF and BHK-21 were also produced. These were used for research as well as quality control purposes. Requests for the cell culture and media from various Divisions of the Institute and the two colleges were also met. A culture bank of these same cells are being maintained in liquid nitrogen in the Division.

The Freeze Drying Section also renders lyophilizing services for bacteria vaccines being produced by the Bacterial Vaccine Production Division (BVPD). These include Contagious Bovine Pleuropneumonia (CBPP) vaccine, Fowl Typhoid Vaccine (FTV), and *Brucella S* vaccines.

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**Table 1: Viral Vaccines Production Figure (doses) January – December, 2021**

MONTH	ARV	IBDV	FPV	NDV-K	NDV-L	NDV-L <sub>500</sub>	NDV I/O	NDV-I <sub>250</sub>	NDV-I <sub>200</sub>	PPRV	LSD	GPV	Total
Jan	-	-	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-	-	-
Mar	9,588	-	-	1,904,400	-	-	-	220,050	-	489,600	-	-	2,623,638
Apr	-	-	-	-	-	-	-	-	-	-	-	-	-
May	-	-	-	1,799,600	1,000,800	1,867,500	-	-	-	1,411,500	-	65,250	6,144,650
June	-	-	-	-	3,914,600	-	-	978,500	-	-	-	-	4,893,100
July	-	-	-	-	1,947,800	-	-	993,000	-	-	-	-	2,940,800
Aug	-	-	-	-	-	-	-	-	-	347,150	-	-	347,150
Sept	4,791	-	1,416,600	-	-	-	-	-	-	-	-	-	1,421,391
Oct	-	1,331,800	-	981,400	1,007,600	-	-	826,650	-	-	-	-	4,147,450
Nov	-	-	-	-	1,016,400	-	-	252,150	-	-	-	-	1,268,550
Dec	20,821	-	-	-	-	-	-	-	-	-	-	-	20,821
<b>TOTAL</b>	<b>35,200</b>	<b>1,331,800</b>	<b>1,416,600</b>	<b>4,685,400</b>	<b>8,887,200</b>	<b>1,867,500</b>	<b>-</b>	<b>3,270,350</b>	<b>-</b>	<b>2,248,250</b>	<b>-</b>	<b>65,250</b>	<b>23,807,550</b>

**Table 2: Summary of Vaccine Production for 2020 (DOSES)**

S/No	VACCINES	QUANTITY
1.	ARV	35,200
2.	IBDV	1,331,800
3.	FPV	1,416,600
4.	NDV-K	4,685,400
5.	NDV-L	10,687,400
6.	NDV-I/O	0,00
7.	NDV-12	3,270,350
9.	PPRV	2,248,250
10	Goat Pox	65,250
<b>TOTAL</b>		<b>23,807,550</b>
Diluents (Sterile distilled water 200ml)		2,870

## NOTABLE ACTIVITIES

- Repairs and reactivation of a two refrigerated centrifuges
- Repairs of GT-40 freeze dryers
- Repair of ultra-low freezers
- Installation of power back-up (solar panels/inverters) for refrigerators
- Commencement/supply of production of Anti-rabies under the RIDESSE project

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## CHALLENGES/CONSTRAINTS

1. COVID-19 pandemic with the consequent control measure
2. Breakdown of the Lyofast 7.0 Freeze Dryer due to outdated software
3. Constant breakdown of the Lyovac GT 40 Freeze Dryers
4. Lack of potent vaccine Master seed for most of the vaccines
5. Loss of Vero cell line for the production of PPR Vaccine
6. Poor quality of embryonated chicken eggs
7. Outdated and obsolete production equipment

## FUTURE PLANS

- Increase dose/vial of critical vaccines in order to drive down cost of vaccines and compete favorably in the market with foreign vaccines
- Resuscitation of roller machines for the increased production of cell culture-based vaccines
- Development of cell culture based anti-Rabies and Fowlpox vaccines
- Procurement/Sourcing of vaccine master seed viruses

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