

PREFACE

The year 2020 was exceptional in so many respects but, especially as a result of the outbreak of the severe acute respiratory syndrome corona virus 2 (SARSCoV2) that is popularly known as COVID-19. What initially was thought to be a Chinese “cup of tea” soon turned out to be a global problem resulting to changes in almost every sphere of human endeavors. The Institute was not left out of the effects of the pandemic and the subsequent measures adopted by the government to curb its tide in order to safeguard the lives of the citizens. As a result, general activities of the Institute initially slowed down as most of the staff were asked to stay at home. Howbeit, activities of the Institute later picked up and continued unabated throughout the year under review through the combined efforts of the Senior Staff with support of staff on essential duties. Hence, despite the challenges posed by COVID-19, the staff defied all odds and worked assiduously to achieve the mandate of the Institute. The results presented in this Annual Report is commendable and is a clear testimony of the commitment and dexterity of NVRI staff.

Furthermore, the Biosafety Level- 3 (BSL-3) laboratory of the Institute was approved and designated by Plateau State and the Federal Government as the official COVID-19 testing center for Central and Northern States. Subsequently, over 38, 000 human samples were screened for COVID-19 within the year. In addition, the Institute produced and supplied Virus Transport Media (VTM) to relevant bodies involved in sampling and diagnosis of COVID-19 in the country. The Institute also had notable collaborations with many International Organizations i.e., Excelvet -Consultants, France; The European Union; The West African Centre for Emerging Infectious Diseases (WAC-EID); UK Research and Innovation and Global Challenges Research Fund (GCRF) – UK.

Another peculiarity of the year 2020 for NVRI, is the transition of the helmsman of the Institute between three hands. The new Director/Chief Executive shared her “Vision and Mission” for the Institute with Directors, Assistant Directors, Heads of Divisions and Change Agents of the Institute at a 3-day Strategic Planning Retreat. The emphasis was “Team Spirit” to move NVRI forward.

Working together in love and guided by Team Spirit the present management is determined to chart a course to carve an enviable niche for the Institute on both the local and international fronts.

I wish you happy reading

Dr Maryam Muhammad (DVM, MSc, PhD)

Director/Chief Executive

2020 Annual Report

MANDATE

- To conduct Research into all aspects of animal diseases, their Treatment and Control.
- To Develop and Produce animal Vaccines, Sera and Biological to meet the National demand
- To provide Surveillance and Diagnosis of animal diseases
- To introduce Exotic Stock for improved egg, meat and milk production
- To provide Extension Services and publications to poultry and livestock farmers
- To Train intermediate Manpower in Veterinary Laboratory Technology and Animal Health and Production Technology.

OBJECTIVES

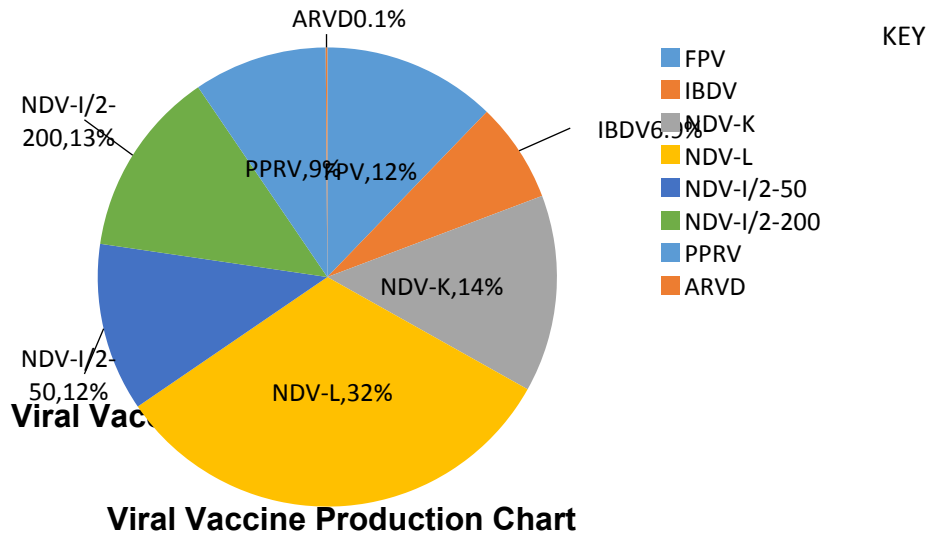
- To increase vaccine production level from the current 40% to meet national demand
- To conduct research on important animal diseases and zoonoses with the development of intervention strategies
- To conduct disease surveillance and provide timely diagnosis
- To develop and maintain a dynamic and comprehensive digitalize animal disease data base
- To establish a quality management system

ACHIEVEMENTS IN VACCINE PRODUCTION

Summary of Viral Vaccine Production for 2020 (DOSES)

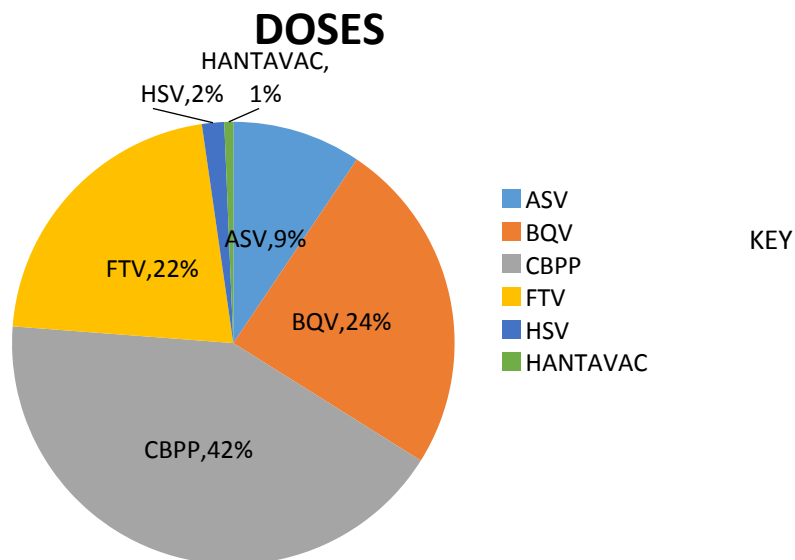
S/No	VACCINES	QUANTITY
1.	ARV	37, 878
2.	IBDV	5, 818, 600
3.	FPV	5, 469, 000
4.	NDV-K	5, 638, 200
5.	NDV-L	20, 546, 600
6.	NDV-I/O	2, 392, 200
7.	NDV-12 (50 DOSES)	6, 303, 450
8.	NDV-12 (200 DOSES)	4, 103, 650
9.	PPRV	3, 873, 350
	TOTAL	54, 182, 928

DOSES

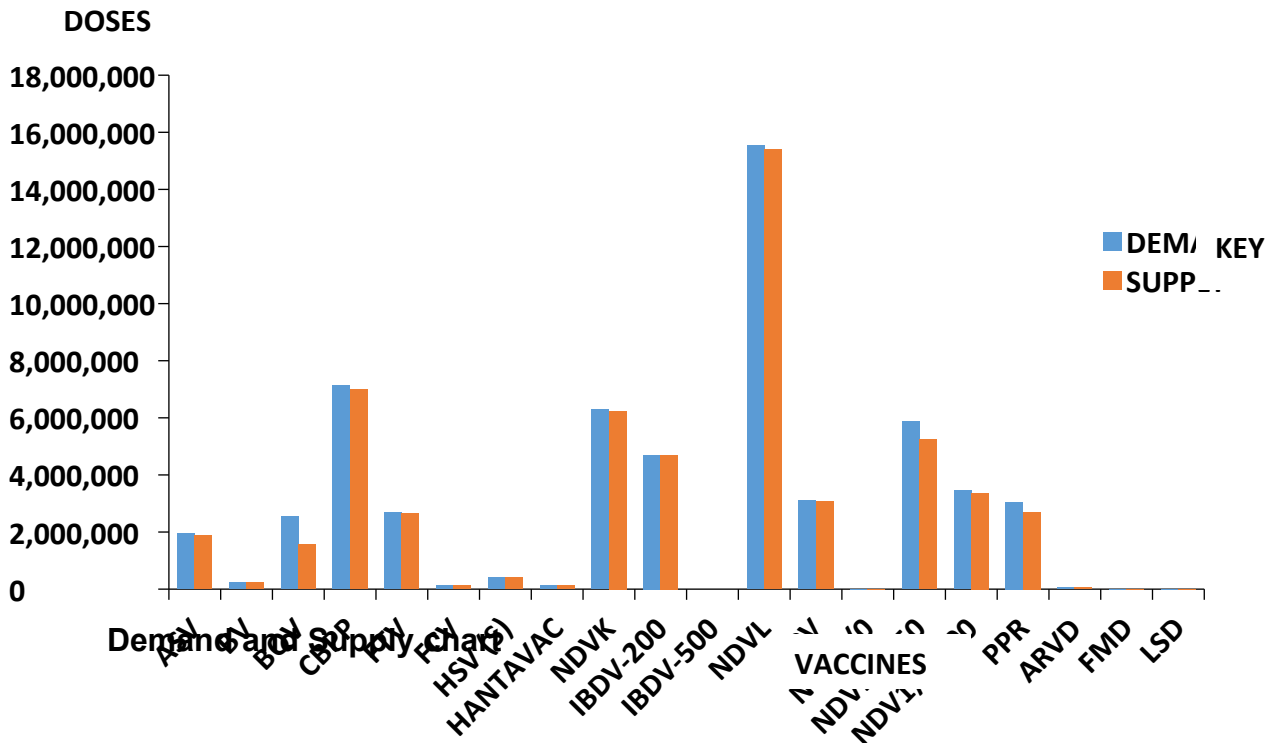


Summary of Bacterial Vaccine Production for 2020 (DOSES)

S/No	VACCINES	QUANTITY
1.	ASV	1,139,880
2.	BV	0
3.	BQV	2,959,560
4.	CBPP	5,113,300
5.	FCV	68,600
6.	FTV	2,534,500
7.	HSV	263,120
8.	HANTAVAC	112,880
TOTAL		12,191,840



Bacterial Vaccine Production Chart



ACHIEVEMENTS IN RESEARCH

1. Isolation of viruses using appropriate cell lines was done.
2. Isolation of Lumpy skin disease Virus, Goat Pox Virus, Sheep Pox Virus, Orf Virus, Cow Pox virus, Camel Pox Virus, Bovine Papilloma Viruses and Pseudo-lumpy skin disease virus in embryonated eggs and cell lines.
3. Isolation of NCDV, IBDV, FPV using embryonated chicken eggs and cell lines.
4. Detection of the first incursion of new disease - Rabbit hemorrhagic disease virus into the country.
5. Molecular diagnosis of COVID-19 in Nigeria (over 38,000 samples analyzed).
6. Research to underscore the epidemiology of the morbilliviruses disease in the country circulating in Nigeria.
7. Research into more effective vaccine options for PPR (Peste des petits ruminants).
8. Research on Lumpy skin disease in cattle, sheep and goat.
9. Research on avian viral diseases especially Newcastle, Infectious Bursal disease, Chicken Infectious Anemia and Fowl Pox Viral diseases in Nigeria.
10. Development of Lumpy Skin Disease Vaccine and Goat Pox Vaccine in cell culture.
11. Development a Foot and Mouth Disease Vaccine which is currently undergoing field trials.
12. Development of pen side/field technique for the diagnosis of livestock diseases.
13. Investigation of the antiviral activities of some indigenous plant extract on some isolated avian viral agents.
14. Research into the antimicrobial compounds from *Euphorbia hirta*.
15. Research into the sub-acute toxicity evaluation of 3 herbal formulations prepared by the Plateau State COVID-19 Research Team using experimental rats.

16. Evaluation of the effect of *Khaya senegalensis* seed extract on blood glucose concentration of alloxan induced hyperglycemic rats.
17. The Institute 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).

ACHIEVEMENTS IN QUALITY CONTROL

In the course of the year under review, the Institute some vaccines to AU-PANVAC for the purpose of external quality control and certification via DHL as the courier service provider. The details of the vaccines shipped are presented in the Table below.

Details of representative batches of different vaccines sent to AU-PANVAC for external quality control

Vaccine Type	Batch No.
Newcastle Disease Vaccine I ₂ Thermostable (NDVI-2) 200 doses	01/2020
Newcastle Disease Vaccine I ₂ Thermostable (NDVI-2) 200 doses	02/2020
Newcastle Disease Vaccine I ₂ Thermostable (NDVI-2) 50 doses	03/2020
Newcastle Disease Vaccine I ₂ Thermostable (NDVI-2) 50 doses	07/2020
Newcastle Disease Vaccine-Lasota (NDVL)	01/2020
Newcastle Disease Vaccine-Lasota (NDVL)	05/2020
Anthrax Spore Vaccine (ASV)	01/2020
Anthrax Spore Vaccine (ASV)	02/2020
Black Quarter Vaccine(BQV)	01/2020
Fowl Typhoid Vaccine (FTV)	02/2020
Haemorrhagic Septicaemia Vaccine (HSV)	01/2020
Haemorrhagic Septicaemia Vaccine (HSV)	02/2020
Hantavac Vaccine (HV)	01/2020

ACHIEVEMENTS IN SURVEILLANCE AND DIAGNOSIS OF ANIMAL DISEASES

Due to the negative impact of COVID-19 that restricted movement in 2020, the yearly rigorous nationwide surveillance and diagnosis of animal diseases by the Institute was hampered. Consequently, little surveillance and diagnosis of animal diseases were recorded

1. National surveillance on the status of Lumpy skin disease, Sheep and goat pox, contagious ecthyma in Nigeria
2. 176 samples from seven (7) animal species (dogs, cattle, sheep, goat, cat, pig, and Bats) were analyzed for rabies in 2020. The specimens came from 15 states. Research samples were analysed by DFAT and/or MIT during the collaboration/bench work bench activities
3. Surveillance on morbilliviruses (Peste des petits ruminants and canine distemper) and related viruses (Canine Parvovirus) in all states of the federation.
4. Diagnosis of the viruses using serological (competitive ELISA, blocking ELISA), Immunocapture ELISA and molecular biology (RT-PCR) techniques was successful.

5. Surveillance and diagnosis of avian viral diseases in Nigeria using Haemagglutination inhibition, agar gel immunodiffusion and polymerase chain reaction (PCR) followed by sequencing.
6. Routine diagnosis of lumpy skin disease, sheep and goat pox and contagious ecthyma from field samples using ELISA, conventional and real time multiplex PCR.
7. A survey of camel brucellosis was carried out in Kano and Jigawa and states. A total of 473 samples were collected from abattoirs and camel markets.
8. Routine serological diagnosis carried out by RBPT on 1,117, serum samples consisting of 447, from bovine, 268 from canine, 112 from caprine, 349 from ovine and 1 from porcine.
9. Routine cultural diagnosis was also carried out on 25 samples, 22 vaginal swabs and one each of lungs, liver, and abomasum content from bovine.

OTHER ACHIEVEMENTS

1. Successful development of the veterinary extension phone application app for community animal health workers was achieved.
2. Over 1000 Litres of hand sanitizers was produced
3. Maintenance and periodic assessment of preserve bovine frozen semen
4. 470 metric tons of silage were produced on 14.8 hectares of land.
5. Production of quails and other species of birds and livestock
6. Completion of twining program with IZSVe, Italy
7. Collaborative research work with Grand Cereals Limited on feed trials in the farm is ongoing.
8. Other areas of collaboration are as shown below:

S N	Period	Name of Organization	Title of Programs, Projects & Activities	Beneficiaries / Participants	Locations / States
1	2019 –2022	Global Affairs Canada	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).	Scientist, livestock farmers	Across the country
2	2020-2022	EXCELVET-CONSULTANTS, France	Supporting Evidence-based Interventions to Achieve Agricultural Development Goals Programme (SEBI)	Livestock farmers	Across the west and central Africa region
3	2020-2021	European Union	EUFMD: Study on the evaluation of the role of small ruminants in the spread and endemicity of Foot-and-Mouth Disease in Northern Nigeria	Scientist, livestock farmers	Northern States of Nigeria
4	2020 – 2024	European Union	EU Support to Livestock Disease Surveillance Knowledge Integration (LIDISKI)	Herders and poultry owners, field vets, community animal health workers, association of	Plateau, Bauchi, Yobe, Adamawa, Kano, Kaduna

				breeders	
5	2018 – 2021	African Union And The EU	Developing Innovative and Sustainable Approaches to Prevent the Spread of African swine fever in Africa (ASF-6RESIST)	Pig farmers	Nigeria, Uganda and Glas
	2020 - 2021	Global Challenges Research Fund (GCRF) - UK	Automatic tracking to monitor feeding behaviours of pigs	Pig farmers	Vom
6	2017 – 2020	EXCELVET CONSULTANTS, France	Evidence-based interventions to reduce ruminants mortality and reproduction losses in Nigeria. Activities included systematic review on published and grey literatures on diseases of economic importance responsible for mortality and losses of ruminants. Followed by field survey to determine these diseases. Based on outcome of the field survey, stakeholders, including the then CVON, ED of NVRI agreed on control of mastitis and FMD. This is a grant won by SEBI. Subcontracted to ExcelVet, France. NVRI was involved as a facilitator - meaning fund was only released for specific tasks. The farmers in all the states were beneficiaries. The Nigerian government and by extension NVRI is a beneficiary. All farmers that gave their consent participated.	The field survey was in Bauchi, Niger, Nasarawa, Sokoto, Zamfara, Kano, and Kaduna states. For the study on mastitis control	Plateau state was selected at the stakeholders meeting in Abuja
7	2020 - 2021	UK Research and Innovation	Assessment of mineral deficiencies in cattle to improve cow fertility and production in Plateau State, Nigeria	Dairy farmers	As a seed award, only Plateau state was selected because of the diary activities between the farmers of the state and the IDF, Plateau state
8	2019 -	Propcom	Digitalization of Veterinary	Livestock/Poultry	Adamawa, Bauchi,

	2020	Maikarfi and Farm Innovation Nigeria	Extension Services	Farmers, Community Animal Health Workers, Para-veterinarians	Borno, Gombe, Jigawa, Kaduna, Kano, Taraba and Yobe States
9	2020-2025	West African Centre for Emerging Infectious Diseases (WAC-EID)	Surveillance for emerging infectious diseases for early warning		