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INTRODUCTION



The past year has been a very busy and eventful one for the Institute. The Institute continued to pursue its programmes of infrastructural and human capacity development to enable it meet its mandate of livestock research and vaccine production

In an effort to ensure sustainability, quality research and effective service delivery, the Institute embarked on the employment of young research officers from the veterinary and basic sciences. This recruitment exercise in addition to future exercises will enable the Institute put in place a durable succession plan that will maintain the tradition of research excellence for which the Institute is known.

The Institute has continued to build capacity for research and vaccine production through postgraduate and short-duration training for staff at various Institutions of learning and research both in the country and abroad. The fellowship training for the Institute's staff at overseas research laboratories has broadened the horizon of such staff and boosted their morale. This has translated to change of attitude and greater commitment to work and improved quality of research activities. Continuing education training programmes were also mounted for staff and were facilitated by Professors from the Veterinary Faculties in the country.

The Diagnostic Department of the Institute continued to provide support services to farmers and the Nigeria PACE Programme for Rinderpest eradication and the control of other epizootic diseases in the country.

The demand for vaccines and other products from the Institute is on the increase. In order to cope with these demands and also improve on the quality and quantity of products, the Institute initiated the process of acquiring a new Freeze-Dryer and a Labelling machine. The acquisition of these equipment will accelerate the process of achieving quality assurance and current Good Manufacturing Practices (c-GMP).

During the year, in addition to the various scientific research publications, 57.20 million doses of viral vaccines and 8.96 million doses of bacterial vaccines were produced.

The Institute hosted scientists from within and outside Nigeria to its 80th Anniversary Celebrations.

Dr (Mrs) L. H. Lombin,
Director/Chief Executive.



80th Anniversary Celebration Opening Ceremony: (R-L) The Executive Governor Plateau State, Chief Joshua C. Dariye, The Honourable Minister of Agriculture, Mal. Adamu Bello (Dan Iyan Adamawa), The Chairman of the Occasion, Chief Audu Ogbe OFR (National Chairman PDP) and Chief Olatunde A. Badmus (National President, Poultry Association of Nigeria)



NVRTI Cybercafé: Commissioning of IT facility by Chief Audu Ogbe and the Hon. Minister of Agric, Mal. Adamu Bello (other Dignitaries observing) during the Institute's 80th Anniversary Celebration (Inset Cybercafé)



The Executive Director with dignitaries at the commissioning of the New Digital Labelling Machine for vaccine production



Cutting of the Anniversary cake: (Centre) Chairman opening Ceremony (Chief Audu Ogbe) and other Dignitaries

RESEARCH REPORTS

ISOLATION AND CHARACTERIZATION OF NEWCASTLE DISEASE VIRUS FROM RECENT OUTBREAKS IN COMMERCIAL AND FREE-RANGE CHICKENS

New Castle Disease (ND) is endemic in many countries of the world. One of the most characteristic properties of the ND virus is its great variation in pathogenicity for chickens. The virulent strains have been implicated in several outbreaks in both commercial and free-range chickens and outbreaks of the disease have been reported in both vaccinated and unvaccinated flocks.

The Objectives of this study were to investigate reported outbreaks, isolate and characterize the Newcastle disease virus isolates from these outbreaks and establish a type culture bank for isolates. This will aid in the generation of data on the occurrence of the disease in Nigeria.

Tissue samples were collected from various reported outbreaks. Thirty-five (35) tissue samples were obtained from reported outbreaks in Gombe, Nassarawa, Kaduna, Bauchi and Plateau States. The samples were processed and inoculated into 9 to 11 day-old minimal-disease-free chicken embryonated eggs.

Twelve (12) isolates were obtained and partially characterized by the Mean Death Time (MDT) method. Four (4) velogenic and two (2) mesogenic strains were characterized.

DEVELOPMENT OF A WATER-BASED THERMO-STABLE VACCINE FOR CONTROL OF NEWCASTLE DISEASE IN RURAL POULTRY

The population of poultry in Nigeria is put at about 150 million with rural poultry accounting for about 80%. In recent years, rural poultry has come to assume a much greater role as a supplier of meat and animal protein for both rural and urban dwellers. These indigenous chickens are hardly ever vaccinated or treated and may act as a source of infection for commercial flocks.

The purpose of this study was to introduce the heat-tolerant strains of NDV-I2 vaccine for the protection of village chickens against ND. The project is expected to address the establishment of a cheap and effective method of protecting Nigerian village poultry against ND through a simple delivery system of the vaccine through its incorporation in water.

The study was also to establish whether the heat-resistant NDV-I2 vaccine strain provides adequate protection against the velogenic NDV strains circulating in Nigeria and compare the efficacy of the NDV-I2 vaccine to those of HB 1 and La Sota, test the suitability of water as a carrier for the vaccine and confirm that the heat-adapted NDV strain of Newcastle disease vaccine protects chickens against virulent local strains of the virus.

So far, twenty-seven (27) isolates of the virus have been obtained from different agro-ecological zones. A flock of minimal-disease-free chickens has been established. A titration of NDV-I2 seed obtained from University of Queensland in Australia is being maintained and the growth curve study of NDV-I2 seed harvest has been completed.

Results obtained include partial biological characterization [Mean Death Time (MDT), Intravenous Pathogenicity Index (IVPI), and Intra-cerebral Pathogenicity Index (ICPI) of

thirteen isolates revealing four (4) Velogenic, eight (8) mesogenic, and one (1) Lentogen strain of the virus

DEVELOPMENT OF A KILLED ADJUVANTED OIL-EMULSION VACCINE AGAINST EGG DROP SYNDROME

Egg drop syndrome (EDS) is caused by a haemagglutinating adenovirus which is shed through faeces and is also vertically transmitted through eggs. An oil-adjuvanted inactivated vaccine is widely used and gives good protection against clinical disease. Birds are usually vaccinated between 14-16 weeks of life. Properly vaccinated birds are protected against the disease and do not appear to excrete the virus whereas improperly vaccinated birds with low HI titres excrete virus when challenged. The duration of immunity could be over 12 months and the vaccine could be stored at -150C without freezing for 18 months. Antibody to EDS virus can be detected by indirect fluorescent antibody (IFA), Enzyme-Linked Immunosorbent Assay (ELISA), Serum neutralization test (SNT) and HI test in 5 days and Double immuno-diffusion (DID) test

in 7 days after experimental infection. They reach a peak in about 4-5 weeks.

The objective of this study is to develop an oil-emulsion vaccine against egg drop syndrome virus and to carry out efficacy trial of the developed vaccines.

The peak virus titre was obtained by inoculation of 0.1ml of the neat EDS virus into 10 day-old embryonated duck eggs via the allantoic cavity and incubation at 37°C for 96hrs. The value obtained was log₂ 15.

Objectives achieved so far are the pilot production of EDS allantoic fluid for vaccine production, the killing of the allantoic fluid in readiness for vaccine production and the determination of peak virus titre.

SEROLOGICAL SURVEY OF EGG DROP SYNDROME (EDS) ANTIBODIES IN DUCKS, COMMERCIAL AND FREE-RANGE CHICKENS

The objectives of this study include the determination of seroprevalence of EDS in birds, the screening of ducks, free-range and commercial unvaccinated chickens for EDS antibodies and to recommend the use of EDS vaccine by farmers. Three hundred and thirty-

four (334) serum samples were collected from three States and screened by Haemagglutination-Inhibition (HI) test. EDS antibodies were detected in 1.2% of commercial unvaccinated chickens in birds tested in Plateau, Taraba and Gombe States.

SEROLOGICAL SURVEY OF INFECTIOUS BURSAL DISEASE VIRUS ANTIBODIES AND ANTIGEN IN COMMERCIAL FLOCKS IN PLATEAU STATE

Infectious Bursal Disease (IBD) also known as Gumboro is caused by a virus classified as a member of the genus *Avibirnavirus* of the family *Birnaviridae*. The clinical manifestation of the disease is mostly in young or growing

chickens usually aged 3-6 weeks. Turkeys, ducks, guinea fowls and ostriches may be infected. The clinical disease may be diagnosed by a combination of diagnostic signs, and post mortem lesions.

The objectives of the study include investigation of all reported Infectious Bursal Disease outbreaks, isolation and characterization of virus isolates, the establishment of type culture bank and the generation of data on the occurrence of outbreaks around the country.

The project was executed through a combination of laboratory trials of IBD vaccines on experimental flocks and the testing of field sera and tissues collected post-vaccination from commercial farms.

The experimental chickens were grouped and subjected to different field conditions to simulate field situation prior to immunization. In addition to the sera collected from the experimental birds, a total of five hundred and ninety eight (598) sera were collected from the field out of which three hundred and two (302) were positive by the AGID test and out of fourteen (14) tissue samples collected, seven (7) were positive for viral.

A success rate of 50.50% was achieved in the vaccination against IBDV as carried out by the study. 50 % of all the tissue samples tested were positive for IBDV viral antigen.

PESTE DES PETITS RUMINANTS (PPR) AND PARAINFLUENZA 3 RESEARCH: THE ROLE OF CAMELS IN THE TRANSMISSION OF PPR

Pestes des petits ruminants (PPR) is a highly fatal disease of sheep and goats caused by a paramyxovirus of the genus morbilivirus. Although primarily a disease of small ruminants, other species of livestock are associated with the epidemiology of the disease. This study was carried out to detect viral antibodies in serum and in tissues of the same animals to ascertain the role of camels as carriers of the PPR virus using the Enzyme-linked Immunosorbent assays (ELISA) in order to determine the role of camels in the epidemiology of PPR.

Sixty (60) samples each of lungs,

mesenteric lymph nodes, spleens and sera were collected from apparently normal camels at slaughter in Kano abattoir. Seventy six (76) lungs, one (1) lymph node and 76 sera were obtained from Maiduguri abattoir. A total of 257 tissues and 136 camel serum samples were collected for PPR screening.

Tissues were processed and then screened by the Immunocapture ELISA (ICE) while the sera were tested by the competitive ELISA. None of the tissue samples and sera was positive for the PPR virus.



Guinea pigs at the Laboratory Animal Experimental Station

DETERMINATION OF DURATION OF IMMUNITY IN GOATS VACCINATED WITH PESTES DES PETITS RUMINANTS HOMOLOGOUS VACCINE

Pestes des petits ruminants is a viral disease of sheep and goats characterized by high morbidity and mortality. Control is essentially by vaccination. A homologous vaccine has recently been produced by the Institute and the objective of the study was to evaluate its field performance in terms of the onset and duration of immunity in small ruminants for the purpose of field immunization.

Two groups of goats kept in closed management system, at two different locations, were vaccinated with the homologous PPR vaccine after pre-vaccination serum samples were taken.

One pre-vaccination and 12 batches of post vaccination (PV) serum samples were

collected. Post vaccination sera were initially collected monthly and later bi-monthly. So far, seven batches have been tested by C-ELISA. One pre-vaccination and 13 batches of post vaccination serum samples were collected and screened by C-ELISA from the Institutes farm located in Vom.

Results of the pre-vaccination and 1st to 7th PV samples are presented in Table 1. The results of the pre-vaccination samples and 1st to 8th PV samples from the Institutes farm are presented in Table 2. Antibodies were detectable by day 5 PV and peak immunity was achieved by day 21 PV. This study is still in progress until the duration of immunity is determined

Table 1: C-ELISA results of the serum samples collected from animal vaccinates in Heipang.

	Nos. of Positive Samples	Nos. of Negative Samples	Total Samples
3rd PV -30th May, 2003	18	15	33
4th PV -30th June, 2003	5	32	37
5th PV -1st Aug, 2003	8	25	33
6th PV -5th Sept. 2003	13	15	28
7th PV -14th Nov. 2003			33
Total	44	87	131

Table 2: C-ELISA results of the serum samples collected from animal vaccinates in the LID.

DAYS	MONTHS	No. TESTED	No. +ve	% -ve
Prevaccination	0	54	8	14.80%
1st PV	21 days	60	37	61.60%
2nd PV	1st Month	75	41	54.60%
3rd PV	2nd Months	54	26	48.10%
4th PV	3rd Month	80	31	38.70%
5th PV	5th Month	NT	NT	NT*
6th PV	7th Month	NT	NT	NT
7th PV	9th Month	NT	NT	NT
8th PV	11th Month	NT	NT	NT

* NT – Not tested

MONITORING OF ANTIBODIES AND ANTIGENS TO AFRICAN SWINE FEVER VIRUS IN PIGS

African swine fever (ASF) is one of the most serious problems afflicting the swine industry of Nigeria because of its high mortality and spread in pigs, its crippling socio-economic consequences and its tendency for rapid and unanticipated spread. Recent reports indicate that 18 states of the federation have experienced the outbreak. There have been many other reports of unconfirmed outbreaks occurring in most parts of the country.

The disease is clinically similar to other haemorrhagic diseases of pigs and therefore any acute haemorrhagic infectious disease of pigs must be differentiated from ASF. At present, no effective treatment or prophylaxis exists for the disease. Control depends on early detection and the enforcement of quarantine and zoo sanitary measures in order to prevent further spread to uninfected herds. The presence of wild suids underline the importance of further investigation on ASF and the need for constant sero-monitoring of

Table 3

Sample Type	Location	Number Tested	Type of Test	Result
Serum	Ogun State (Otta)	13	I-ELISA	6/13
Serum	Ogun State (Otta)	11	I-ELISA	1/11
Serum	Kaduna	11	I-ELISA	Negative
Serum	Plateau (Kuru pig farm)	34	I-ELISA	6/34
Serum	Kaduna Zonkwa and Kurmin B	2	I-ELISA	$\frac{1}{2}$
Serum	Kaduna Mifi, Manchok, Jankassa, Kafanchan Zonkwa	40	I-ELISA	3.40
Serum	Ogun (Otta)	44	I-ELISA	3/44
Serum	Plateau (Ra-Hoss)	7	I-ELISA	1/7
Serum	Plateau Daholbop	8	I-ELISA	8.8
Lymph node, Spleen, Liver, Lung	Plateau Dahlbop	12	PCR	All Positive
Liver, Lung and L/N	Plateau Jos wild life park	5	PCR	All Positive
Lung, Liver, Spleen, Kidney and L/N	Plateau, Vom	8	PCR	All Positive
Lung, Spleen Liver and L/N	PACE/Makurdi/Ibadan/Plateau	5	PCR	All Positive
L/N Spleen and Lung	Kaduna	5	PCR	1/5 LN Positive

antibodies and antigens to ASF virus in the national pig herd. The objectives of the present study were to determine the sero-epidemiology of the disease in the country, isolate and classify the virus from cases, determine the involvement of wild suids in the epidemiology of ASF in Nigeria and survey for soft tick vectors and their role. A control strategy for implementation will be suggested.

Sera and tissues from ASF suspected pigs were received for laboratory analysis from Ogun, Kaduna, Oyo, Benue and Plateau States. Several visits were also made to institutional and state farms for field investigation of suspected outbreaks. Laboratory detection of specific viral antibodies and antigens by indirect ELISA and direct immunofluorescence were employed. Some tissue samples were also tested for viral DNA genome by PCR. 183 sera and 22 tissues were received for diagnosis of ASF. Results obtained are as outlined in Table 3.

Much insight into the sero-epidemiology of the disease in the country has been gained

through the project and further work is on-going.

DEVELOPMENT OF CAPRI POX VACCINES

Sheep pox (SP) and goat pox (GP) are viral diseases of sheep and goats characterized by fever, generalized papules or nodules, occasional vesicles, internal lesions particularly in the lungs, and death. When presented in a virulent form, up to 50 percent of affected animals die and generally mortality among infected kids and young stock is often much higher, while loss from abortion is common.

Lumpy skin disease (LSD) is a pox virus disease of cattle characterized by fever, nodules on the skin, oedema of the skin, and sometimes death. LSD has occurred in all the diverse ecological zones in Africa. The disease is now enzootic throughout sub-Saharan Africa. The clinical diagnosis of LSD has been reported in Nigeria while the occurrence of the benign disease in epizootic proportions has been described since the 1970s.

Capri pox is of economic importance because it causes reduced production in ruminants, particularly dairy herds, and serious damage to the hide. The persistence of Capri pox in epizootic proportions in Nigeria underscores the economic importance of the disease and calls for the development of potent vaccines for effective control.

The objectives of the study are to validate Capri pox virus candidates for vaccine production and test them for purity, freedom from adventitious viruses, in particular pest viruses, such as

border disease and bovine diarrhoea virus, and from contamination with bacteria, fungi and Mycoplasma and for safety. They will also be tested for minimum clinical reaction when administered and efficacy; stimulation of immunity to sheep pox, goat pox and lumpy skin disease in all breeds of sheep, goat and cattle.

So far, the isolation of LSD virus, SP virus and GP virus from field outbreaks have been achieved. The attenuation of 3 Capri pox viruses using different cell lines and the characterization of attenuated Capri pox viruses have also been completed. The cultivation of lamb testis (LT) cells, reactivation and freeze-drying of LSDV, SPV and GPV have also been done. The 3 Capri poxviruses have been adapted to LT cells along with the isolation of virulent LSDV from infected field tissues. Limited testing for sterility has also been carried out.

Local Capripox virus isolates have been attenuated, characterized and freeze-dried as vaccine candidates. Also Capri pox vaccine candidates have been certified free of bacteria and fungi and the technology for lamb testis cultivation has been perfected. Further works include the determination of minimum infecting dose, laboratory trials for safety and efficacy, field trials, cross immunity studies and the determination of the duration of immunity.

BRUCELLA RESEARCH PROGRAMME

The Epidemiological surveillance of brucellosis in Nigerian livestock, including the isolation, identification and bio-typing of *Brucellae* obtained from clinical samples of animals were carried out. The project was also to establish whether the field strains were attenuated or virulent. The immune and pathological response with that of S19 and Strain W.544 (WHO pathogenic reference strain) were compared. Splenic clearance of Brucella organism and pathological lesions

were evaluated for 20 weeks after inoculation in BALB/c mice. *Brucella* organisms persisted in the spleen of mice inoculated with field strains of *Brucella* for at least 20 weeks compared to that of S19 that lasted for 12 weeks. Pathologic lesions were more severe in mice inoculated with field strains compared to those of S19 and w544. The field strains of *Brucella* tested were found to be virulent and cannot be used as vaccine candidates.

MYCOPLASMA RESEARCH PROGRAMME

The study on the prevalence of Contagious Bovine Pleuropneumonia in Nigeria was continued. Sero-surveillance was carried out using specimens sent to the laboratory under the Pan African Control of Epizootics programme (PACE) and private farmers. These were analysed using Competitive Enzyme Linked Immunosorbent Assay (c-ELISA) and Slide Agglutination Test (SAT) to determine the prevalence of infection in

suspected outbreaks and apparently disease-free animals.

1,605 samples were examined out of which 1,418 were tested. 1372 were screened by c-ELISA and 46 by SAT. The number positive was of 142 (8.8%) out of which 124 were positive by c-ELISA and 18 by SAT.

PASTEURELLA RESEARCH PROGRAMME

Pasteurellosis, caused by *P. multocida*, *Mannheimia haemolytica* and *P. trehalosi* is among the commonest diseases that continue to have a major impact on the health of farmed animals in Nigeria. Fowl Cholera, Haemorrhagic Septicaemia, pneumonic pasteurellosis and atrophic rhinitis are some of the important pasteurellosis causing enormous losses in animals.

The *Pasteurella* programme focused on the surveillance of pasteurellosis in poultry, cattle and pigs with emphasis on isolation, characterization of the *Pasteurella* species and *Pasteurella* type culture collection.

Fourty five (45) samples were examined from cattle, 22 from pigs and 4 from chickens. Two of the cattle samples were positive for *Pasteurella multocida* while 12 were positive for *P. (M) haemolytica*. From the pig lungs 2 isolates of *P. multocida* were obtained while 3 isolates of *P. multocida* and 1 *M. haemolytica* were found in the chicken lungs and liver samples. The vaginal swabs of 100 apparently healthy cows were also sampled out of which 2 were found positive with *P. multocida*.

LISTERIA RESEARCH PROGRAM

Surveillance of Listeriosis in Livestock has continued with isolation, identification and characterization using classical culture

methods. Examination was conducted in 95 ovine samples. Out of this 30 (31.6%) were positive for *Listeria monocytogenes*

CAUSES OF MORTALITY IN JAPANESE QUAIL (*COTURNIX CONTURNIX JAPONICA*) REARED ON DEEP LITTER

Commercial poultry production has been on the decline due to the high cost of feed, inadequate supply of day-old chicks, diseases, high cost of drugs and biologicals. This led to the search for alternative and cheaper sources of poultry products and the subsequent introduction of the Japanese quail in Nigeria.

This study investigated some causes of mortality of the Japanese quail reared on deep litter. Monthly farm records covering a period of 4 years were used. The quail were classified as chicks (1-4 weeks), growers (4-6 weeks) and adults (above 6 weeks). For each month, total number of birds and mortality for each category was recorded and

yearly means calculated. A record of disease conditions diagnosed during the period was also collected. Results obtained showed drowning, smothering, Salmonellosis, Colibacillosis, Pasteurellosis, and Histomoniasis as the common causes of mortality in quail chicks, growers and adults. There was significant difference ($P < 0.05$) in mortality between chicks, growers and adults. Although these birds are hardy quail can be affected by common poultry pathogens and should be reared separately from other birds.

THE REPLACEMENT VALUE OF GUINEA CORN FOR MAIZE IN QUAIL CHICK DIET

A six-week feeding trial was conducted to determine the replacement value of Guinea corn for maize for growing quails. It involved 360 day-old quail chicks on deep litter. Four iso nitrogenous (22% Crude protein) diets incorporating graded levels (0, 15, 27 and 42%) of guinea corn as replacement for maize were used in the trial. The M.E levels of the diets ranged from 2700 – 2750 kcal/kg. Each treatment was replicated thrice. Feed intake, weight gain and feed/gain ratio did not differ significantly ($P > 0.05$) among the treatments. Feed cost decreased numerically across the treatments and

was lowest for the diet in which 42% maize was replaced by guinea corn. Feed cost/kg gain was numerically lower for one diet than for others and compared favourably with those reported by other workers. Results of this study also indicated that at a dietary crude protein level of 22% and M.E of 2700 to 2750 kcal/kg feed, 42% guinea corn-based diet was suitable for acceptable growth performance in Japanese quail chicks in the first six weeks of life.

INCIDENCE OF PROLAPSE IN LAYING CHICKENS

The inability of the oviduct to retract promptly after egg-lay results in prolapse. This could attract other birds to peck at the protruding part, causing haemorrhage, infection, and death. Poor management such as overexposure to light and inadequate feeding during the growing and laying period can predispose birds to prolapse. Once started and unchecked it results in death or loss of eggs in layers.

A survey was conducted to determine the incidence of prolapse in laying chickens, within Jos South Local Government Area of Plateau

State. Forty questionnaires were distributed to farmers, out of which 34 (85%) responded. Results obtained showed that 24 (70.5%) of the respondents encountered prolapse in their laying flock, 14 (41.1%) of the farmers culled their birds with the prolapse, while 11 (32.3%) attempted treatment and 9 (26.4%) disposed of their birds by slaughter. Management practice by the respondents were, extensive 2 (5.8%), intensive 25 (73.5%), and semi intensive 3 (8.8%).

EPIDEMIOLOGY OF HAEMOPARASITES IN DOMESTIC ANIMALS

Trypanosomosis is a disease of humans and animals transmitted by *Haematophagus* insects. A survey was carried out to establish the seasonal prevalence of the disease in relation to the vectors and to establish the seasonal prevalence pattern of Trypanosomosis in cattle in Vom and its environs, investigate the role of other *Haematophagus* flies, establish the species of trypanosomes these flies can transmit to cattle in the study area and to note the role of introduction of cattle from other agro ecological zones in the epidemiology of Trypanosomosis.

Traps were set along cattle routes and near paddocks for catching the vector, *Glossina* and

any other *Haematophagus* flies that may be involved in mechanical transmission of the *Trypanosoma* spp.

The buffy coat, thick and thin smear techniques were employed for confirming the presence of *Trypanosoma* spp. Other parasites in blood samples were also examined. Of the 27 blood samples collected, no *Trypanosoma* spp were seen. However, 4 samples were positive for *Anaplasma marginale* and one for *Babesia bovis*. No fly was caught in the traps set. The project is intended to cover all the seasons of the year.

A SURVEY OF FISH PARASITES IN JOS AND ITS ENVIRONS

Fish farming is becoming a good means of livelihood and is an important source of protein. The need to understand their parasite problems has also become necessary.

In Plateau State many of the dams that resulted from mining excavations have been converted into fish ponds. The objective of this study was to determine the parasites that affect both cultured and wild fish and determine their zoonotic

importance.

Fish was collected from three locations in and around Jos and were made up of 5 adult *Clarias* spp, 3 fingerlings of *Basus* spp, 3adult *Elastes* spp, 10 fingerlings of *Tilapia* spp and 14 fingerlings of *Clarias* spp. Two out of the 5 adult *Clarias* spp were found to be positive with parasites which have yet to be identified.

THE EFFICACY OF *MOMORDICA BALSAMINA* ON COCCIDIOSIS IN RABBITS

Hepatic coccidiosis is an important parasitic disease in rabbits caused by *Eimeria stiedai*. The disease is common among weaners. Clinical signs include wasting, diarrhoea, ascetis and polyuria. Grossly the liver is enlarged and studded with white nodules.

The aqueous fruit bark of *Momordica balsamina*, a plant with world wide distribution is used by local poultry farmers for the general well-being of their birds. A study was conducted to determine the active anti-coccidian principle of *Momordica balsamina* plant, its anti-coccidial effect and the mechanism of action of the plant extract.

Physiological parameters were monitored over a period. Gross pathological examinations of dead or surviving animals and phytochemical analysis to determine active principles were also carried out. Amprolium® a popular drug for the treatment of coccidiosis was used as control.

Results showed that the powdered extract of *M. balsamina* contained a high quantity of resins⁽⁺⁺⁺⁾ and moderate quantities of alkaloids⁽⁺⁾ and flavonoids⁽⁺⁾ and tannins. Treatment for a period of 14 days with

both the extract and Amprolium® did not yield significant reduction in the oocyst count. The oocyst count reduced considerably as the

treatment progressed while the coccidial load increased in the untreated rabbits.

DETERMINATION OF THE ECTO AND ENDO PARASITES OF NEWLY INTRODUCED EXOTIC BIRDS IN NVRI, VOM

Geese and quails are considered exotic as they are not indigenous to the Nigerian environment. A study was conducted to identify the possible parasites harboured by these exotic birds and to carry out a parasite count to determine the burden 18 ostrich faecal samples, 30 faecal and feather samples of geese and 10 quail intestinal

scrapings and feathers taken during post-mortem were examined for parasites. All samples tested negative for both ecto and endo parasites. The project is on-going and work continues on the isolation and identification of parasites.



DEPARTMENTAL REPORTS

LIVESTOCK INVESTIGATION DEPARTMENT

The major activities of the department are those of adapting exotic animals to the Nigerian environment through cross breeding, provision of livestock animals for vaccine production and for experimental purposes. The Department also produces forage for livestock feed and formulates rations for feed concentrates

Cultivation Section

This section produces forage (silage and hay), feed ingredients (Soya beans, maize) and develops pastures. In 2004, 700 metric tones of silage was produced valued at ₦17,500,000, 6,588 bales of Hay valued at ₦1,976,400, 1680kg soya beans valued at ₦91,200 and 3000kg of maize valued at ₦135,000 and 100kg of Rhodes grass seeds valued at ₦120,000.

Piggery Section

The 54 pigs left on the farm were all wiped out by ASF.

Feed Mill Section

The following feeds were produced by the section for the feeding of all the farms livestock: 17.92 tons of Dairy maintenance ration, 35.52 tons Beef maintenance ration and 36.00 tons. Others are 12.36 tons Calf maintenance ration, 11.04 tons Breeding bull maintenance ration, 15.76 tons for sheep & goats, 8.80 tons horse maintenance ration and 1.32 tons milking maintenance ration.

Beef Section

The section had 21 calves 10 of which were disposed of. Three calves were transferred to the calf section, three to dairy and 3 were salvaged through slaughter

Dairy Section

The opening stock for the 2004 was forty-two (42) animals (i.e. one bull, sixteen cows, nineteen heifers and six calves). There were

Twenty-one (21) normal calving (10 males and 11 females).

The artificial insemination programme has commenced this year in the section. Semen collection and evaluation are in progress and seventeen females were inseminated. 12 were confirmed pregnant and the remaining five re-inseminated without return-heat and monitored for confirmation of pregnancy. Routine operations such as spraying, deworming and monthly weighing were carried out on schedule.

Milk Production

A total of 4,876.50 litres of milk was produced by an average of nine cows. Out of these, 720 litres was fed to lambs and kids, 240 to piglets, 360 to calves and 3,556 litres was sold at the milk shop Total value of milk produced ₦146,295. Total number of animals in this section stood at 49 animals comprising of one bull, 26 cows, 14 heifers and 8 calves at the end of the year.

Small Ruminant Section

The Section had two units; Sheep and Goat Units housing 76 goats and 42 sheep.

Laboratory Cattle Section

This Section had an opening Stock of 62 animals in January with 14 calving and a closing stock of 48 Animals in December 2004. The low closing stock was because 10 animals were transferred to other units, 14 were sold, 3 used for vaccine production and one animal died.

Liquid Nitrogen Production Unit

The Section produced 3, 735 litres in 2004. Out of these, NVRI was supplied with 406 litres for internal use, 464l to sister Research Institutes, 1,442l to Private Farms and 1,423l to Teaching Hospitals.

Health Section

This Section facilitated research activities by providing researchers with samples for their project works.

POULTRY DEPARTMENT

The Department's mandate is to produce fertile eggs for vaccines, chicks for vaccine-testing and for research. The Department also adapts exotic breeds of poultry. A minimal stock of 10,000 quails was

maintained throughout the year, parent stock was purchased and delivered to the farm from NAPRI and 3000 broilers were raised and sold to the public.

DAGWOM FARM

The farm is responsible for the feed milling, pasture development, rabbitry and kerosene incubator fabrication. In 2004 the feed mill section continued its production of feed and full fat soya bean cake. The fabrication section continued with the production of kerosene incubators of varying capacities refurbishing of furniture, construction of animal cages and the maintenance of farm equipment and machinery. The rabbitry section maintained its role as a multiplication and distribution centre for

rabbit breeding stock and provided cross breeding services to interested farmers. The pasture development section continued with hay production, vegetable gardening for small animals, the aborium for dermatophilosis research seed multiplication. 1859 bales of hay were produced from pangola and signal grass, 2018 stands of lettuce and cabbage were distributed and 1.3 hectares of *Stylosantus guinensis* was established at the cattle paddock.

EPIDEMIOLOGY DEPARTMENT

The Clinical Pathology and Alternative Medicine Unit have just been renovated and are awaiting stocking.

Histopathology Unit

Renovation work has just been completed in the unit.

Virus Diagnostic Unit

214 dogs suspected of rabies were presented to the unit. The Seller staining technique for Negri bodies was used for diagnosis. 107 samples were positive for rabies, 101 negative and 6 putrid.

Ambulatory/Consultancy Unit

The unit as part of its activities carried out disease investigation, treatment, immunization and consultancy services. 2,212 animals, mostly bovines were attended to from Plateau, 1199 animals were handled, Nassarawa (650), Kaduna (102), Taraba

(161) and Borno (100). Trypanosomosis, CBPP, Helminthosis, mineral deficiency and ectoparasitism were the most common diseases encountered. All the endangered species in the Jos Wildlife Park were also screened for tuberculosis.

Microbiology Unit

272 avian samples were received from which the under listed diagnoses were made; New castle Disease (17), Coccidiosis (81), CRD (33), IBD (4), Fowl Typhoid (59), Mareks disease and (6) Nutritional deficiency (4). Others were Colibacillosis (24) Cannibalism (2) Helminthosis (9) and Fowl Cholera (1). Bovine samples processed were 333 and the diagnoses include; CBPP (32) Trypanosomosis (32), Snake bite (1), Helminthosis (89), Tuberculosis (4), Black Quarter (1), Botulism (4), Listeriosis (21), Lumpy Skin Disease (2) and Papilloma (1).

Canine cases examined were 4 out of which 2 were positive for Parvovirus Enteritis. Keratoconjunctivitis and Pneumonia were recorded in the other 2 cases. African swine fever was a major problem in the porcine species during the period under review. Out of 132 cases examined 106 (80.3%) were positive. Ten ovine cases were processed from which diagnosis made were PPR (2), Coccidiosis (1), Helminthosis (4) and Pneumonia (1). Seven zoo animals were also handled including a lion, an eland and a red river hog.

Laboratory Animal Unit

Presently this unit has in stock for research and vaccine testing 412 Mice, 105 Rats, 168 Rabbits and 143 Guinea Pigs. Plans are under way to resuscitate the Grass-cutter (Cane-rat) breeding programme.

PARASITOLOGY DEPARTMENT

404 faecal samples and 345 blood samples from different animal species were examined for parasites. They include bovine samples (601), equine (8), leporine (23), canine (67), buffalo (1) and giraffe (1). Others are chicken (23), geese (15), quail (1) and ostrich (1). Parasites isolated from bovine specie were *Eimeria alabamensis* (1), *E. bovis* (8), *E. zuernii* (2), *Oesophagostomum radiatum* (63), *Fasciola* spp (6), *Paramphistomum cervi* (36), *Anaplasma marginale* (14), *Babesia bovis* (17) and *Trypanosoma vivax* (1).

BACTERIAL RESEARCH DEPARTMENT

Diseases Diagnosed

296 serum samples, 46 milk samples, 11 vaginal swabs and 3 preputial washings were collected for *Brucella* culture and serology as part of routine diagnostic work. Out of 296 serum samples tested for *Brucella* antibodies, 42 were positive by RBPT and 26 by SAT. From 46 milk samples tested by MRT, 24 were positive.

Objectives achieved so far include the isolation, identification and bio-typing of all *Brucella* obtained from aborting animals in

Autopsy Unit

Post-mortem work is carried out in this unit. Lack of a functional cold room for storage of carcasses is a serious limitation to this unit.

Pan African Control of Epizootics (PACE) Report

The department was able to process the following samples received from the Pan African Control of Epizootics (PACE). Bovine samples were 730 out which diagnosis made include CBPP (49), Trypanosomosis (19), Foot and Mouth Disease (2). The 4 porcine samples received were positive for African Swine Fever (ASF) while 97 caprine and 22 ovine samples processed recorded 35 and 7 positive for PPR respectively.

Bunostomum spp was isolated from buffalo, *Oesophagostomum* and *Babesia* spp from giraffe while 4 of the equine samples were positive for *Strongylus vulgaris*. The parasites seen in the canine samples include *Toxocara canis*, *Ancylostoma caninum*, *Isospora* spp and *Oesophagostomum radiatum*. Others are *Ascaridia galli*, *Syngamus trachea* and *Eimeria mitis* from chicken. *Coccidia* spp and *Hymenolepis nana* were identified from the laprine samples.

Nigeria, the establishment of the virulence of the *Brucella* isolates obtained and serological testing for *Brucella* antibodies from serum samples obtained from cattle, sheep and goats by RBPT and SAT as well as from milk by MRT.

Future plans for this Programme include, molecular characterization of all *Brucella* isolates, testing of serum samples obtained from cattle, sheep and goats using ELISA and the preliminary production of *B. abortus* SRB 51 vaccine.

Under the Dermatophilosis research programme 26 Skin scabs from sheep and goats and 75 Soil samples were collected and screened for *Dermatophilus* organism. *Dermatophilus congolensis* was isolated from 5 goats and 4 sheep. All the skin scabs collected were positive by direct smear.

Dermatophilus congolensis was not isolated from all the soil samples analyzed. However, *Nocardia spp* were isolated from 5 soil samples.

PLANNING, BUDGET AND HUMAN RESOURCES DEVELOPMENT

The Division includes Planning, Statistics, Monitoring & Evaluation, and Human Resource Development. The Department

formulates capital Programmes, Co-ordinates development Projects, monitors and evaluates all planned Programmes/Projects



A cross section of participants at the Professional and Technical training on Computer



A cross section of participants at a two-week training session in Veterinary Epidemiology and Project Design held at NVRI Dermatophilosis Conference Room



(L-R) His Excellency, Executive Governor of Nassarawa State, Alh. (Dr) Abdullahi Adamu (Sarkin Yakin Keffi) being conducted round NVRI vaccine production facility by the Executive Director, NVRI Vom, Dr (Mrs) L. H. Lombin



The EDVR (R) conducting Members of the National Assembly House Committee on Agriculture round the Institute's facilities, during their oversight function to NVRI Vom.

and the collects, analyses and stores Data on all Programmes/Projects of the Institute.

The Institutes budget and perspective plans are prepared by this Division. It also serves as the Secretariat of the Institute's IMC and Tenders Board and the supervises the activities of the Printing Press.

Databank

The Department maintains the institutes database. Data include those of vaccine production, staff nominal roll, landed properties and all research data. During 2004 it coordinated the construction of the Institutes cybercafé, auditorium renovation, security office construction and the installation of the communication equipment for security. All publications of the Institute are supervised by the Department.

Courtesy Visits

In conjunction with the Protocol Unit, the Planning Department coordinated courtesy visits to the Institute as follows:

1. NIPSS Participants Senior Executive Course No.26, 2004 on Thursday, 12th February, 2004.

2. ASP Promotion Course 1/2003 Nigeria Police Staff College 25th February, 2004.
3. Poultry Association of Nigeria (PAN) on Wednesday 17th March, 2004.
4. Honourable Minister of State for Agriculture and Rural Development Bamidele F Dada, (OON) Monday 10th May, 2004.
5. Federal Controller of Housing & Urban Development Tuesday 11th May, 2004.
6. His Excellency, the Executive Governor of Nassarawa State Alh (Dr) Abdullahi Adamu (Sarkin Yakin Keffi) 31st May, 2004.
7. Special Adviser on Agriculture to the President & National Chairman People's Democratic Party (PDP) Chief Audu Ogbe (MFR) on 21st June, 2004.
8. Vice-Chairman Senate Committee on Agriculture and Rural Development Senator Haruna Garba Friday 17th September,2004
9. Members of the Federal House of Representative Committee on Agriculture & Rural Development Friday 24th September,2004

BACTERIAL VACCINE PRODUCTION DEPARTMENT

The Department recorded an increase in the amount of vaccines. The provision of production materials improved, giving rise to the production of a total of 16,318,580 doses; an 82.3 % increase over the 2003 figures. From the 16,318,580 doses produced, 15,635,000 doses were issued to the Stores Department for sale. The difference was retained for reference and for quality control. Enhanced procurement of production materials via the Due Process has continued. So also is the renovation and upgrading of production facilities.

Anthrax Spore Vaccine (ASV)

2,181,400 doses of ASV were produced. Renovation work and procurement of an essential equipment, incubator was took place in this section during the year. Additional senior staff was also posted to

the section. These improvements boosted the vaccine production figure.

Black Quarter Vaccine (BQV)

1,949,000 doses of the vaccine was produced; an increase of 155,500 doses over that of 2003. The vaccine was steadily produced throughout the year

Brucella Vaccine (BV)

No *Brucella* S19 vaccine was produced due to the low demand as 63,200 doses were still available.

Contagious Bovine Pleuropneumonia Vaccine (CBPP)

There was a slight increase in the demand for CBPP vaccine in 2004. 6,872,500 doses were produced representing 126% increase over that of 2003 (3,043,600 doses). This success

was mainly due to the availability of working materials especially horse serum.

Fowl Typhoid Vaccine (FTV)

3, 572,500 doses were produced, a 165.6% increase over the for 2003. This success was a result of the stable and available production materials and the renovation of infrastructure carried out in the section. The production of 1000 doses/vial of FTV has commenced and is awaiting final quality control tests and approval before release.

Fowl Cholera Vaccine (FCV)

1,248,600 doses were produced, which is 165,400 doses higher than that of 2003.

Both FCV and FTV are produced in the same laboratory.

Hantavac Vaccine

182,560 doses of Hantavac Vaccines were produced. This was due to a shortage of materials.

Quality Control

The Department's Internal Quality Control section continued to assess all the vaccines produced

Haemorrhagic Septicaemia Vaccine (HSV)

311,720 doses of HSV were produced, also due to material constraints.

VETERINARY EXTENSION & RESEARCH LIAISON SERVICES DEPARTMENT

The Institute reaches all the farmers in Nigeria through the Veterinary Extension and Research Liaison Service (VERLS) Department. The aim is to ensure healthy and productive animals to provide the much needed animal protein and disposable income farmers.

Farmers can be reached through:-

OFAR (On-Farm-Adaptive-Research-trials)

MTRM (Monthly-Technology-Review-Meeting)

Surveys (general and thematic)

Training Workshops/Meetings

Publication (radio programs and print materials)

WIA (Women-In-Agriculture) Programmes

OFAR

No OFAR trials were conducted in 2004. However proposal was submitted for Kerosene Incubator OFAR.

Surveys

No surveys conducted in 2004.

MTRM

The Department participated in Plateau State ADP MTRM on two occasions.

Training Workshops and Meetings

The Institute organized an open day for pastoralists in May 2004. A staff of the Department attended a training workshop on Participatory Epidemiology at IITA Ibadan. This was in preparation for a survey in Benue State.

Publications

A total of 75 radio programs on different aspects of livestock health, management, production and responses to questions received from livestock farmers have so far been produced. Twenty five of the were for "Itoju ohun osin" aired on FRCN Ibadan, thirty for *Muleka rugage* aired on FRCN Kaduna and 20 programmes in 'Ahu ike umu anumanu' (Ibo)/Animal health time (Pidgin English).

Print Publications

Six different posters; 500 each on rabies, bird flu and African swine fever were produced for distribution to all the States of the Federation to raise awareness on these diseases. An Extension bulletin on bird flu was also

produced. The Maiden edition of the institute's newsletter christened 'NVRI Info' was also produced. The Poultry production innovations: Women-In-Agriculture workshop proceedings was also produced. Thirteen Extension leaflets have been reviewed and are currently in print.



Reclaimed Paddock for livestock grazing at the NVRI Vom by Seed Bank and Pasture unit

Table 5.Comparable Production and Dispatched Figures for 2003 & 2004

VACCINE	2003		2004	
	PRODUCED	DISPATCHED	PRODUCED	DISPATCHED
ASV	1016400	1002000		
BQV	1730500	1700500	2181400	2154600
BRUCELLA S19V	255900	254700	-	-
CBPPV	3043600	3032400	6872800	6846400
DFTV	1360100	1347300	3072500	3043100
FCV	108320	1052000	1228600	1198700
HANTAVAC	194520	191400	182560	178240
HSV	2276720	268160	311720	304960
TOTAL	8,950,140.00	8,848,460.00	16,318,580.00	15,635,000.00

LIBRARY AND DOCUMENTATION DEPARTMENT

The library has served as a veritable source of information that facilitates access to literature to the research scientists and other clientele. To realize the goal and objective of the library to the Institute, the library is organized in various sections to provide services, at professional and sub professional levels. These are the technical services, reference and serial sections. Staff strength is made up of six professional librarians, six Library Assistants, two Library attendants and three cleaners. Renovation work on the library building was completed in November, 2004 and furniture procured to replace the old reading tables. Thirty book titles were procured in 2004 and some books were donated by the Food and Agriculture Organisation (FAO).

Services Rendered

There was limited acquisition and subscription activity in respect of Journals, books and monographs. This caused a lull in collection development for the library. Efforts are on to procure books, journals and other information sources on standing order for the library.

Technical Services Section

The core duty of this section is to catalogue and classify books and other information materials for the library. During the year, technical reports from agencies like F.A.O. Australian Centre for International Agricultural Research (ACIAR) were received and processed. 35 technical reports and 120 text books were catalogued and classified.

Circulation Section:

685 students registered as members of the library. Lending services was impressive 2450 loan records of books were made to readers. The clientele record came to 3880.

Serial Section

This section received 2500 reference queries from the various categories of clientele; including research staff, students others on referral visits. Materials consulted were journals, abstracts, and indexes, from which they made photocopies of articles of interest.

Computer Section

The automation exercise of the library resources and service is in progress and management replaced the old desolate computer with another which is of higher capacity and configuration.

NVRI STAFF SECONDARY SCHOOL, VOM

The school in the year under review, the Examination (WASSCE) results of May,/June 2004 had a score of 72.4% pass West African Senior School Certificate

Table6 WASSCE 2004 Result Analysis

S/No	Subject	Student Numbers	A1	B2	B3	C4	C5	C6	D7	E8	F9	% Passed
1.	English	107			1	3	5	21	17	31	29	72.9
2.	Mathematics	107		1	4	1	3	18	17	24	39	63.6
3.	C.R.K.	92		1	2	2	3	12	21	25	26	71.7
4.	History	1								1		100
5.	Economics	106			1	1	2	16	28	25	35	67.0
6.	Geography	95		2	2	2	3	19	24	23	20	78.9
7.	Literature	60				1	4	6	22	15	12	80.0
8.	Biology	107				6	6	19	9	36	31	71.0
9.	Chemistry	47				3	6	16	8	9	5	89.4
10.	Government	50				2	3	6	10	22	17	66.0
11.	Physics	47			7	4	10	11	12	3		100
12.	Agric Science	84			5	3	7	12	22	17	18	78.6
13.	Home Management	26			6	3	7	4				100
14.	IRS	8				1	2	1	1	1	2	75.0
OVERALL % PASSED			=			72.4						

The National Examination Council (NECO) results of June/July 2004 recorded 82.5%.

NECO 2004 Result Analysis

S/NO	SUBJECT	NUMBER OF STUDENTS	A1	B2	B3	C4	C5	C6	D7	E8	F9	% PASSED
1.	English	109					3	18	26	20	42	61.5
2.	Mathematics	109				1	6	24	18	26	34	68.8
3.	C.R.K.	94			1	2	4	10	19	49	9	90.4
4.	History	1								1		100
5.	Commerce	8								5	3	62.5
6.	Economics	108				3	10	16	15	37	27	75.0
7.	Geography	103		1	4	9	13	10	22	39	15	85.4
8.	Literature	56		1		5	11	16	9	11	2	96.4
9.	Biology	109			2	1	12	40	13	21	38	81.7
10.	Chemistry	47				3	9	29	2	3	1	97.9
11.	Government	61			2	4	12	7	1	9	26	57.4
12.	Physics	47				2	1	12	13	13	6	87.2
13.	Agric. Science	84		1	2	6	10	17	25	21	1	98.8
14.	Home Management	18					6	12				100
15.	IRS	8			1		2		1	2	2	75.0
Overall % Passed			=			82.5						

The Junior School Certificate Examination (J.S.C.E) of July, 2004 recorded 100%.

Co-Curricular Activities

The Junior Engineers, Technicians and Scientists (JETS) is a Club activity that effectively harmonises co-curricular out-

class student's activities with classroom and Laboratory experience thus bridging the gap between theory and practice. This laudable idea of club activities in schools was approved by the Federal Ministry of Education in 1987 for participation by young people under the guidance of experienced personnel in the area of Science and Technology. The programme engages students in extra curricular activities with scientific and technological experience. The objectives of the programme are to generate and foster interest in the acquisition of manipulative skills in the area of engineering, technology and the sciences, motivate in students an increase awareness of the impact of technology on contemporary society and promote experimentation and application of scientific and technological concepts. Activities of JETS are meant to enhance theoretical knowledge already gained or acquired in the class room mainly through practical projects

The school participated on two projects under the JETS programme; the free choice and the national theme and constructed an electronic organ which was entered into the competition with other secondary schools in Plateau State. The competition held at two levels, the zonal (Local Government level) and State (finals of best schools from the Local Government zones). At the end of the competition which started in October 2003 and ended in March, 2004 the best three projects were selected and our school project emerged second position.

The school also fabricated a local weaving machine for sustainable economic use. Since this was a National theme project, the school

competed with other secondary schools in the State who presented the same type of project. The competition held in stages from the zonal (Local Government level) to international levels. Zonal competition took place in October, 2003 and our project emerged first position. The State competition took place in March 2004 and our project emerged first position. With this achievement, the school was selected to represent Plateau State at the 2004 National JETS competition. The National JETS competition took place at Sokoto in July 2004 and the school project emerged the best.

With this achievement the school was selected to represent the Country at the International level ;"ESKOM EXPO" 2004 competition which took place in South Africa between the 26th September and 2nd October 2004. This competition was for the selection of projects that would represent "ESKOM EXPO"; Young scientists and their countries at international Science Fairs at the world level. In all, 488 different projects were presented by the various representatives. NVRI Staff Secondary School project won a silver medal.

The major achievement of this programme has been the improvement of the student's manipulative skills with the students now fully motivated in the field of technology. However, the project was capital intensive. The school therefore expresses its appreciation to the management of the Institute for the tremendous financial and moral support which made us successful in all the stages of the competition. The school still lacks of technical department and a laboratory for practical lessons.

STAFF REPORTS

Staff Appointments

	NAME	RANK	HATISS
1.	Dr. Samaila Danbirni	Veterinary Research Officer II	8
2	Mr. Benjamin B. Dogonyaro	Research Officer II	07
3	Miss Nina O. Onyekonwu	Senior Laboratory Scientist II	07
4	Mr. David Yakubu Bot	MLS I	08
5.	Mr .Barry Ponfa Samani	Asst. Tech. Officer.	5
6	Mr. J. B. Gajere	Chief Security Coordinator	8
7	Mr. Joseph Akem	Clerical Officer.	3
8	Miss Roselyn Agbe	HTO	7
9	Mr. Nyam Davou Choji	HTO	7
10	Mr. Reuben Job Pam	Gardener	1
11	Mr. Dachung Goji Pam	Gardener	1
12	Mr. Barnabas Ali	Gardener	1
13	Mrs Nvou Michael	Gardener	1
14	Mr . Vincent S. Gukut	Gardener	1
15	Mr. Davou Gyang II	Gardener	1
16	Mr. Bitrus Sunday Pam	Gardener	1
17	Mr. Pam Mangai	Gardener	1
18	Mr. Badung Dachung	Asst. Craftsman	2
19	Mr. Bulus Iliya Pam	Asst. Craftsman	2
20	Mr. Amos Oliver	Craftsman	3
21	Miss. Nugwa Agada	E.O. Accts.	6
22	Mr. Dalyop Gyang Dajah	Cleaner	1
23	Mrs. Martha Ngbede	Educ. Officer.	8
24	Mr. Ben Bako Dokgak	HTO	7
25	Mr. Idoko Anebi	Chief Accountant	13
26	Mr. Isaiah Yahaya	Bursar	13
27	Mr. Jamo Aliyu	HTO	7
28	Mrs. Christiana D. Mancha	Med. Lab. Asst.	3
29	Mrs. Anna Davou	Cleaner	1
30	Mrs. Veronica P. Aren	Cleaner	1
31	Mrs. Laraba Danbaki	Cleaner	1
32	Mrs. Laitu Y. Tongrit	Clerical Asst.	2
33	Mr. Dalyop B. Kataiko	Clerical Officer.	3
34	Mr. Nengak S. Dimka	Clerical Officer.	3
35	Miss Vivian C. Onyeocha	Typist	2
36	Mrs. Adebimpe Adeyemo	Conf. Sec. I	7
37	Mr. Fwansum G. Yenle	HTO	7
38	Mr. Emmanuel Z. Nimmyel	HTO	7
39	Mr. Philibus M. Goholshak	HTO	7
40	Mr. Iliya N. Sule	HTO	7

41	Mr. Maigadi Yakubu	Printer Attendant	1
42	Mr. Joseph Peter	Print. Attd.	1
43	Mr. Joseph Jatau	Graph. Art Attd.	2
44	Mr. Rotimi Adeleye	Graph. Art Attd.	2
45	Mr. Victor Joseph Gyang	Cl. Officer.	3
46	Miss. Clementina K. Nyam	Typist I	5
47	Mr. Dan Dung Pam	E. O (Inf)	6
48	Mr. Mathias O. Molokwu	Stock Verifier	6
49	Mr. Abraham A. Ajibade	Statistician	7
50	Mr. Anthony Chindo	Plan. Officer. I	7
51	Mr. Pam Samuel Jatau	Editor/Proof Rdr	7
52	Mr. Joseph Pam	Craftsman	3
53	Mr Chukwak Tom	Craftsman	3
54	Mrs. Anne E. Drisu	Conf. Sec. II	6
55	Mrs. Alloysius Azer Igyo	Watchman	1
56	Mr. Peter Pwajok Dalyop	Registrar	13
57	Mrs. Felicia Ajimohun	Liv.Offr. II	7
58	Mr. Hezekiah O. Ajibola	Liv. Offr. II	7
59	Mr. Kehinde Ayo-Orooniyi	HTO	7
60	Miss Rahila L. Garba	HTO	7
61	Mrs Elizabeth Mark Elayo	HTO	7
62	Mr. Daniel S. Gbise	HTO	7
63	Mr. Abdullahi Ardo Garba	HTO	7
64	Mr. Dalaham Ayuba	Lab. Asst.	2
65	Mr. Daniel Jauro	Patrol Supv.	5
66	Miss Victoria Gwom	Patrol Supv.	5
67	Mr. Bitrus D. Goma	Asst. Pat. Supv.	4
68	Mr. Fumen H. Kyari	Pat.man/Sec Grd	2
69	Mr. Joel Swam John	Patrol Supv.	5
70	Mr. Ali Waje Nengson	Patrol Supv.	5
71	Mr. Luka M. Maigari	Patrol Supv.	5
72	Mr. Sunday T. Sunday	Patrol Supv.	5
73	Miss Salome Bature Jugu	Hd. Sec. Guard	3
74	Mr. Biola Maisamari	Patrol Supv.	5
75	Mr. Sunday Adam Musa	Patrol Supv.	5
76	Miss Martha Musa	Asst Pat. Supv.	4
77	Mr. Danlami T. Jacob	Patrol Supv.	5
78	Mr. Nimkat Kunfa	Patrol Supv.	5
79	Miss Celyine Inusa-Datohom	Admin. Offr.I	8
80	Mr. Amos Akhidenor	Sec. Guard	2
81	Mr. George Ighile	Sec. Guard	2
82	Mr. Oladapo Omotoyinbo	HTO	8
83	Mr. Ishaku Gaga	Storekeeper	3

Training

Four Heads of Department under-took a study tour of some established vaccine production facilities outside the country. This study tour, sponsored by the Food and Agricultural Organisation (FAO) was meant to expose the staff to current trends in vaccine production and acceptable GMPs.

	NAME	RANK	TYPE OF TRAINING	REMARKS
1	Dr. Clement A. Meseko	VRO II	M.Sc.(Virology)	Uni. Ibadan
2	Mr. H. G. Maikidi	Res. Officer I	M.Sc.(Biochem)	Uni. Jos
3	Mr. Peter O. Aremu	ACMLS	M.Phil/Ph.D(Applied Bio)	Uni.Tech.Ogbomosho
4	Dr. J. O. Ibu	CVRO	Ph.D(Vet.Micro)	Uni. Nsukka
5	Mr. Joseph Mbelev	Prin. Accountant	MBA(Finance)	ATBU Bauchi
6	Mr. Donatus M. Kyuku	Senior Foreman	ND(Mech.Eng.Tech.)	Fed.Poly.Bauchi
7	Mr. Umaru Umaru	ACTO(Vet)	M.Sc.(Ani.Prod.&Health)	ATBU Bauchi
8	Mr. Thomas A. Adisa	Lecturer III	Ph.D(Agro.& Biochem)	Uni. Ibadan
9	Mr. Samuel Shwarzpshaka	Asst. Lecturer	M.Sc.(Agronomy)	ATBU Bauchi
10	Miss Ijeoma O. Nwagbo	Res. Officer II	M.Sc.(Virology)	Uni. Ibadan
11	Dr.(Miss) I.E.Thomasina	VRO II	M.Sc.(Vet.Pathology)	Uni. Ibadan
12	Mrs Phina N. Aziokwu	Prin.Sec.Asst. II	ND(Sec. Admin)	Plapoly B/Ladi
13	Mrs Kate N. Chika	Chief Cat. Asst.	ND(Hotel & Cat.Mgt.)	Plapoly B/Ladi

Deceased Staff

S/No.	Name	Rank	HATISS	Date of Death
1.	Mr. Irimiya Sambo	Asst. Liv. Overseer	2	20/4/04
2.	Mrs. Victoria Nyambee	Cook	3	2/5/04
3.	Mrs. Justina I Tabat	Asst. Ed. Officer I	8	20/7/04
4.	Mr. Danjuma Doro	Chief Liv. Overseer	7	11/9/04
5.	Mr. Yakubu Badung	Chief Med. Lab. Asst.	7	23/9/04
6.	Dr. E. S. Haruna	C.V.R.O.	13	13/11/4
7.	Mrs. Laraba Ayuba	Snr. Store Keeper	3	15/11/04

Staff Retired

S/No.	NAME	RANK	HATISS
1.	Mr. Peter Mancha	Higher Works Supt	9
2	Mr. Maisaje Gyang	Snr. Foreman	6
3.	Dung Darahwol	P.W. Supt.	11
4.	Mr. Yinusa Usman	Foreman	5
5.	Mr. Umaru Inuwa	C.M.L.A.	7
6.	Mr. Yakubu G. Turu	Head Steward	6
7.	Mr. John Pam	A.C.S.L.Tech.	12
8.	Mr. Aliyu Zakari Katanga	A.C.S.L. Tech.	12
9.	Mr. Yakubu B. Ribina	Chief Works Supt	13
10	Mrs. Alice N. Shidali	A.C.E.O. (Acct.)	12
11.	Mr. Boyi Bassah	Head Cleaner I	3
12.	Mr. Boyi Choji	Chief Liv. Overseer	6
13.	Mr. Barnabas Mali	Chief Liv. Overseer	7
14.	Mr. Daniel Nyam Bott	Res. Officer I	7