OAG ZIMBABWE
Office of the Auditor-General

REPORT

of the

AUDITOR-GENERAL

on the

PREPAREDNESS IN THE PREVENTION AND CONTROL OF CATTLE DISEASES

by

THE DEPARTMENT OF VETERINARY SERVICES

Under the

MINISTRY OF LANDS, AGRICULTURE, WATER, CLIMATE AND RURAL RESETTLEMENT

VFM 2018:06

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The Hon. P. Shiri
Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement
2nd Floor, Ngungunyana Building
No. 1 Borrowdale Road
Harare, Zimbabwe

Dear Sir

I hereby submit my Value for Money Audit Report on preparedness in the prevention and control of cattle diseases by the Department of Veterinary Services in terms of Section 11 of the Audit Office Act *[Chapter 22:18]*.

Yours faithfully,

Mshiri
M. CHIRI (Mrs),
AUDITOR-GENERAL.

Harare,
December 24, 2018.

OAG ZIMBABWE
Office of the Auditor-General

OAG VISION

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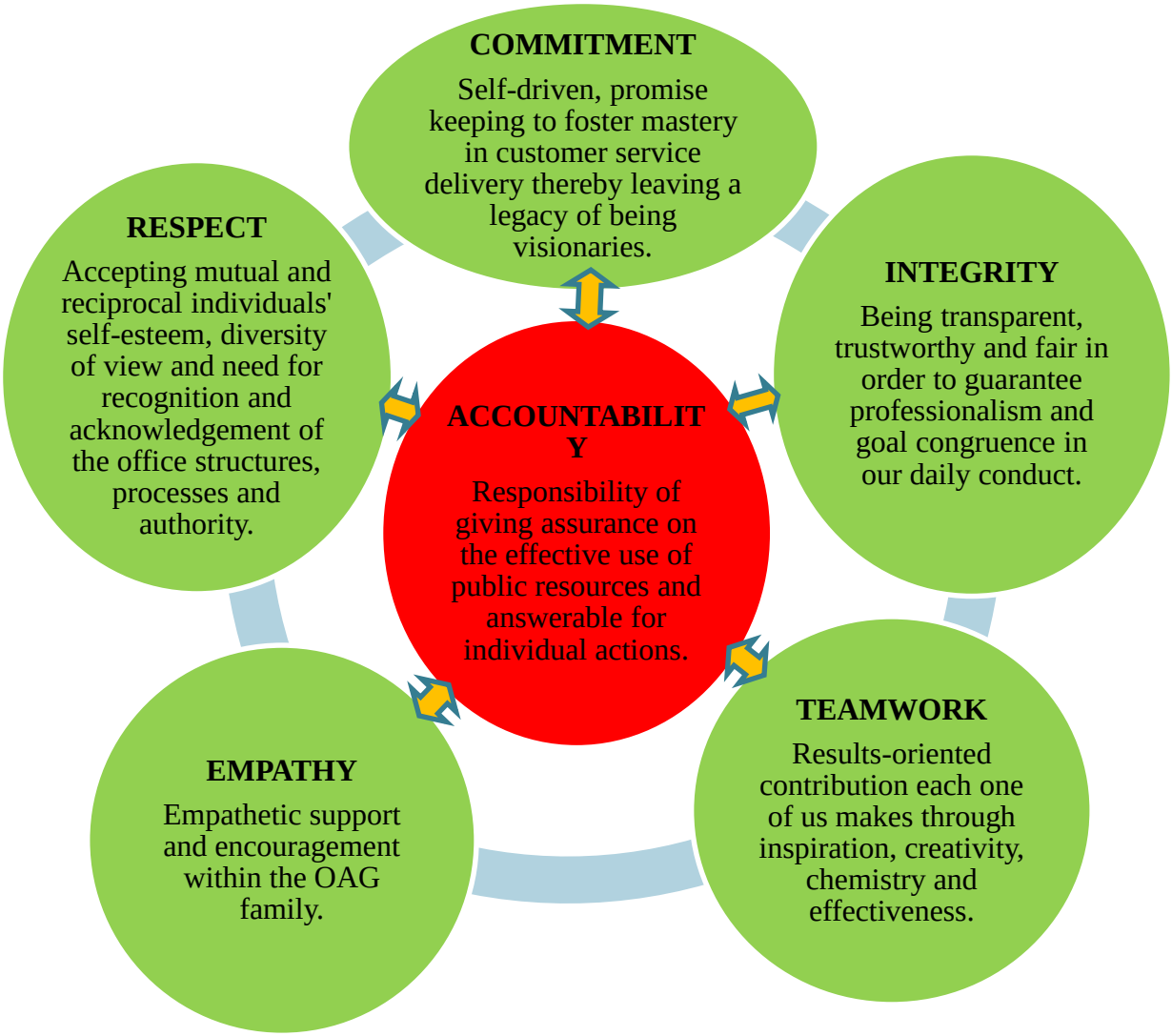

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GLOSSARY OF TERMS

Bacteriology	Study of bacteria
Culturing	Maintaining (tissue cells, bacteria, etc.) in conditions suitable for growth.
Helminthology	Study of parasitic worms.
IFAT	Immuno fluorescent Antibody Test- detect serum antibodies and other body fluids
Molecular Biology	Branch of biology that deals with the structure and function of the macromolecules (e.g. proteins and nucleic acids) essential to life.
PCR	Polymerase chain reaction- A technique used in molecular biology to amplify a single copy or a few copies of a segment of DNA.
Pour on	Pour-on describes a liquid-pesticide, which is applied by pouring onto the skin from where it is absorbed to act as a contact poison for unwanted pests.
Protozoology	Study of protozoa which are diverse, minute acellular or unicellular organisms usually non-photosynthetic micro-organisms.
Serology	Scientific study or diagnostic examination of blood serum, especially with regard to the response of the immune system to pathogens or introduced substances.
Virology	Study of viruses
Zoonotic	A disease that can be transmitted from animals to people or a disease that normally exists in animals but can infect humans.
ZimAsset	Zimbabwe Agenda for Sustainable Socio-Economic Transformation

ACRONYMS

AHI	Animal Health Inspectors
AHMC	Animal Health Management Centre
COMESA	Common Market for Eastern and Southern Africa
CSC	Cold Storage Commission
CVL	Central Veterinary Laboratory
DVS	Department of Veterinary Services
DVO	District Veterinary Officers
EU	European Union
FAO	Food and Agriculture Organization (United Nations)
FMD	Foot and Mouth Disease
GVO	Government Veterinary officers
OIE	Oficia Internacional de Epizooties (World Organization for Animal Health)
RBM	Result Based Management
SADC	Southern African Development Community
VPH	Veterinary Public Health
ZIMRA	Zimbabwe Revenue Authority
ZRP	Zimbabwe Republic Police

EXECUTIVE SUMMARY

Background of the Audit

The Department of Veterinary Services under Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement is responsible for promoting bio-security, animal health and welfare for the benefit of the livestock industry and human well-being. The department is regulated by the Animal Health Act *[Chapter 19:01]* in which it derives its mandate. The primary function of the department includes control and prevention of the introduction, establishment and spread of animal diseases and pests in the country.

My audit was motivated by the results of the pre-study dated May 10, 2018, follow up reports[1] 1 to 15 from 2015 to end of 2017 of the Department of Veterinary Services submitted to the World Organisation for Animal Health and Media reports which respectively highlighted challenges in the prevention and control of livestock diseases, persistent diseases outbreaks and suspension of beef exports by Zimbabwe to the European Union since 2007 because of foot and mouth disease. Livestock is classified in the Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZimAsset) as one of the key drivers of the economy which needed improvement. ZimAsset targeted to strengthen livestock pest and diseases surveillance programmes and livestock research and extension services to prevent and control diseases.

It is for the above reasons that I considered it important to conduct a performance audit on preparedness in the prevention and control of livestock diseases in Zimbabwe focusing on cattle.

I carried out the audit to assess the extent of preparedness in the prevention and control of livestock diseases and also to proffer recommendations for improvement where necessary.

Summary of findings

Despite efforts by the department to uphold its mandate, there have been several outbreaks of serious diseases and significant deaths of cattle in Zimbabwe. The diseases led to significant losses which affected farmers, businesses and regions. It has resulted in Zimbabwe not being able to export beef, for example, to the European Union since 2007. The exports used to earn the country at least USD 45 million per year in nominal prices. Cattle are an integral part of households in Zimbabwe as they are used for draught power in food production and nutrition, hence the death of one ox is a big loss to the community and the nation at large.

Review of the Department of Veterinary Services' annual reports (2015 -2017) showed that 166 997 cases of various diseases in cattle were reported in the country between the period 2015 and May 2018. Of the cases reported, audit gathered that a total of 22 895 cattle died of the diseases.

I present the following shortcomings I have identified in the main operations of the Veterinary Services Department as the main contributing causes to the problem of significant losses of cattle due to various diseases;

[1] Source:https://www.oie.int/wahis_2/public/wahid.php/Reviewreport

1. There were inconsistencies in the implementation of Foot and Mouth Disease (FMD) prevention strategies. Review of the annual reports for the period 2015-2017, FMD prevention and control programme and interviews with veterinary officials revealed that the department was not carrying out regular FMD vaccinations in risk zones as is required. The annual reports also indicated that FMD was spreading to provinces which were disease free like Mashonaland East, parts of Manicaland, Masvingo, and Mashonaland Central. On the other hand, non-availability of fence boundaries between farms as well as game parks to separate livestock and buffaloes were causing serious outbreaks of FMD. The country used to have internal boundaries especially in commercial farms which were fenced to control movement of animals from one farm to the other. Fences that used to restrict movement of buffaloes into cattle grazing areas were also not maintained and, in most cases, non-existent.

2. Regular annual vaccination programs for anthrax were not being done in most of the districts that were visited during the audit. The department, as a fallback, was now focusing on hot-spots and carrying out vaccinations as and when there was an outbreak in areas that surrounded the affected areas.

3. The Department of Veterinary Services did not conduct adequate dipping sessions in all the 8 Provinces during the period 2015 to July 2018 as planned**.** Further, a national analysis of planned and actual dipping sessions done for the period showed that the department missed its planned targets by an average of 23% each year.

    - Documentary review indicated that dipping chemical was in short supply during the period 2015 to 2017. The department managed to distribute 49%, 36% and 56% in the years 2015, 2016 and 2017 respectively of the chemical which was far below the requirement for dipping sessions. To supplement funds for the procurement of dipping chemical, farmers are required to contribute $2 per animal per year as dipping fees. Analysis of revenue returns showed that dipping fees collections have been on a downward trend from 2015 to 2017.

    - From a review of departmental reports, audit noted that 70% of dip tanks (2 637 out of 3 726) in the country needed repairs for them to function properly. Of the 30 dip tanks that I inspected, I noted that 27 thereof were in a deplorable state and needed rehabilitation. The dip tanks did not have standard requirements such as roofs, races, head clamps etc.

4. Review of the Tsetse Control Division's Annual and Results Based Management (RBM) reports indicated that in the period 2015 to May 2018, the division managed to eradicate tsetse flies in an area covering approximately 1 754 km^2 out of the planned 4 200km^2. Audit noted that there was reinvasion in areas previously cleared of tsetse flies. For instance, a survey done in the year 2000, in Matusadonha National Park, indicated that tsetse flies were only confined to an area of approximately 3 500km^2. However, a survey that was done in 2014 indicated that they had spread to an area of approximately 7 500 km^2. The department indicated that if tsetse eradication and control measures are not adequately done, there is a risk that in the next 10 years the tsetse fly would spread to almost all parts of the country.

5. The department's reports and inspections conducted by audit indicated that inspection services at major ports of entry were weak and not sufficiently done due to limited coordination and lack of expertise in animal health by veterinary officers manning the borders. Interviews with veterinary officials indicated that some illegal acceptance of imports were also happening at Chirundu, Forbes, Plumtree, Nyamapanda, Kariba and Mukumbura. On the other hand, reports indicated that there were 661 abattoirs in the country and an analysis done by audit established that approximately 594 abattoirs were not being screened or surveilled for animal diseases hence increasing the chances of ill-health on consumers of meat products.

6. There were inadequate laboratories in the country. The department had only 3 provincial laboratories (Bulawayo, Mutare and Masvingo) and a Central Veterinary Laboratory in Harare. Services provided at these provincial laboratories were below standard and needed to be upgraded to meet international standards. On the other hand, audit noted that the department was failing to meet diseases testing turnaround times for samples received mainly because of lack of testing chemicals (reagents, reverse transcriptase enzymes etc.).

7. From the review of annual reports for the period 2015-2017, audit gathered that the department was not sufficiently and adequately carrying out animal health research to improve its prevention and control mechanisms for various animal diseases. In addition, departmental reports indicated that most research projects that were done during the period were being funded by donors. Audit also gathered that unsatisfactory research performance by the department was also caused by non-availability of experienced researchers.

8. Audit gathered that the department through its Central Veterinary Laboratory produces vaccines for Red water and Gall Sickness disease (Tick-borne diseases). The department was also working to resume production of January diseases vaccine which was previously shelved due to resource constraints. Audit also gathered through interviews that there were no vaccines being produced by the department for diseases of major economic and zoonotic importance such as foot and mouth disease and anthrax as there were no financial and human resource expertise to produce the vaccines.

   From an analysis of the above issues, I have identified some of the administrative causes to the problems in the operations of the Department as follows;

   From the review of financial statements for the period 2015 to 2017 it was established that total revenue amounting to $24 114 342 was generated for the Agriculture Revolving Fund (ARF) by the department. However, no resources were channelled towards procurement and maintenance of the department's motor vehicles, procurement of vaccines and funding of animal health research programmes. Some of the monies generated for the fund were being used to finance other activities of the Ministry and sister departments other than the purposes for which the fund had been created. Audit noted that this was crippling the operations of the Veterinary Services Department.

   Analysis of the Division of Veterinary Services' vehicle register indicated that the department did not have enough vehicles to assist in the discharge of its responsibilities. Audit established

that 55% of vehicles in provinces were non-runners due to inadequate servicing. The majority number of runners were distributed for use at provincial offices and not districts where field visits need to be done.

Analysis of the department's staff establishment showed that key positions which included District Veterinary Officers (DVOs), Government Veterinary officers (GVOs) and Animal Health Inspectors (AHI) (now Veterinary Extension Supervisors) particularly in most of districts were not filled. In addition, audit gathered that none of the 8 provinces across the country had veterinary epidemiologist to manage diseases trends. The research branch was also affected as Chief Veterinary Research Officer posts continued to be difficult to fill due to the freezing of posts as well as failure by the department to get qualified and experienced researchers who met job description requirements. The department was also lamenting about the transfer of new Veterinary Extension Workers (VEW) into the Department of Veterinary Services from other departments such as AGRITEX, Irrigation and Mechanization. The transferred officers had knowledge in crop production and other fields and not in animal health. In addition, technical duties such as animal health inspection and disease surveillance were in some instances being done by unqualified personnel which included dip attendants and general hands.

From the review of department's documents on distribution of protective clothing reports in all provinces indicated that veterinary services workers were not adequately provided with protective clothing. Statistical analysis indicated that there was a distribution gap of 30% for work suits during the period 2015 to May 2018 across all provinces. On the other hand, the distribution gap of rain coats, gumboots, dust coats, safety shoes and sun hats were above 50%. Workers were at a high risk of being injured or contracting diseases at work. Apart from this, none of the provinces visited had adequate camping equipment to use as shelter during field work. Workers at all the tsetse field stations visited during audit, were working in areas with dangerous wild animals like lions, snakes and elephants without rifles and protective clothing to protect themselves in the event of an attack.

RECOMMENDATIONS

My recommendations below are intended to facilitate the prevention and control of cattle diseases.

1. The Department of Veterinary Services must formulate and implement a comprehensive management system for cattle diseases that would ensure emergencies are responded to in an effective and timely manner.

- A proactive approach in preventing and controlling foot and mouth disease should be adopted by the Department of Veterinary Services. This would involve regular vaccination programmes of red zones. During outbreaks, it is recommended that the department conducts coordinated vaccination programmes to all neighbouring districts rather than concentrating on the affected areas only. The department should also make frantic efforts in controlling movement of cattle from red zones to free zones. Movement of cattle from one region to another should be strictly monitored to ensure that all cattle being moved have movement permits in accordance with the regulations.

- Regular vaccination of cattle in anthrax hot-spots should be done timeously by the department to reduce the outbreak of anthrax. Cattle in areas surrounding hot-spots should also be vaccinated to help reduce spread of anthrax in the event of an outbreak. Further, the department should also prioritize provision of drugs or vaccines on cost recovery to Animal Health Management Centres so that farmers can access them easily.

2. The department should prioritize procurement and stocking of enough reserves for dipping chemical to avoid interruption of dipping sessions.

- Comprehensive plans for rehabilitation of dip tanks should be effectively implemented by the department to complement efforts being made by the donor community in dip tank rehabilitation throughout the country. The department may consider engaging farmers to provide labour with the division providing other materials, which according to the department were estimated at $5 000 to rehabilitate a dip tank. There is need also to enhance the dipping program to A1 farmers in resettlement areas by constructing dip tanks.

- Assistance should be given by the department in coordination with other government departments like District Development Fund (DDF) to farmers in regions with low rainfall for example, Region 5 by drilling boreholes. The department should train its staff on how to correctly measure and effectively apply pour-on, a method which is used where there are no dip tanks.

3. Procurement of equipment and insecticides to eradicate tsetse should be prioritized to ensure adequate implementation of tsetse eradication programmes. Tsetse surveillance programmes should also be adequately done. Proper control measures must be instituted to avoid reinvasion of previously cleared areas.

4. Stringent border control systems should be effectively implemented to avoid entry of infected cattle into the country. The border inspection should be strengthened by considering employee skills mix at the ports of entry. Furthermore, to enhance management of border inspection, close cooperation should be established with ZIMRA and ZRP. The department should specify timeframes for animals to enter the country through small official border posts to strengthen monitoring controls and avoid cattle smuggling activities into the country. The department should also adequately monitor operations at all abattoirs.

5. Laboratory facilities at provincial offices should be upgraded to ensure that major disease tests are done. The department should review its financial resource priorities and consider financing establishment of laboratories in other provinces. Further, an emergency buffer stock of reagents or testing chemicals should be maintained to avoid stock-outs. The department should also ensure that all districts have emergency testing kits.

6. Investment in research and development should be considered by the department to avoid donor dependency. They should also consider increasing production of various vaccines to ensure that drugs and vaccines are always available for disease prevention and control as it seemed cheaper to produce than importing. The department should come up with research priorities targeting mainly on how to prevent and control diseases of economic importance so that the country will regain the international market lost due to diseases.

7. Prioritisation of operations must be done by the department and diversion of financial resources to other activities should be avoided. The department should also consider selling drugs at Animal Health Management centres to increase revenue generation and reduce the distance travelled by farmers to city centres in search for drugs.

- Workers should be provided with suitable clothing to protect them against accidents and contracting of diseases at work.

- The Department of Veterinary Services should make sure that available vehicles and motor bicycles are serviced in time. In addition, the department should review its vehicle distribution policy to ensure that vehicles are fairly distributed to provinces and districts to improve operations. This involves deployment of vehicles to critical areas in the department such as districts and animal health management centres.

- A programme of continuing education should be developed to improve the technical and operational skills of all staff of the department. Staff transferred from other departments should be trained and or mentored on animal health to add value in the discharge of duties. The department should also convince Public Service Commission that the posts they need filled are critical.

CHAPTER 1

1. INTRODUCTION

1.1 BACKGROUND

The Veterinary Services is a department under the Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement meant to promote bio-security, animal health and welfare for the benefit of the cattle industry and human well-being. The department is regulated by the Animal Health Act *[Chapter 19:01]* from which it derives its mandate. The Department has two divisions namely; Veterinary Services and Tsetse Control. The Division of Veterinary Services has three sub-programmes under it which includes Veterinary Laboratory Diagnostics and Animal Health, Veterinary Epidemiology and Animal Disease Control and Veterinary Public Health. The Division of Tsetse Control has no sub programmes under it. The primary functions of the Divisions include control and prevention of the introduction, establishment and spread of animal diseases and pests in the country.

1.2 MOTIVATION

The audit was motivated by various media reports highlighting challenges in the prevention and control of cattle diseases. The reports highlighted weaknesses in the vaccination programmes, dipping programmes and diagnosis of diseases. These weaknesses resulted in increased outbreak of diseases resulting in high mortality rates of cattle. The Department of Veterinary Services' follow up reports[2] 1 to 15 from 2015 to end of 2017 submitted to the World Organisation for Animal Health indicated many cattle disease outbreaks during that period.

According to the ZIMASSET[3] document page 55-56, livestock was classified as one of the key drivers of the economy which needed improvement and was targeted to strengthen cattle pest and diseases surveillance programme and strengthening cattle research and extension services to prevent and control diseases. The Herald of August 11, 2015 reported that due to outbreak of foot and mouth disease in 2001, European Union suspended Cold Storage Commission (CSC) beef imports from Zimbabwe. CSC used to have an annual quota of beef exports to the EU of 9 100 tonnes and the company last exported beef in 2007. The beef exports used to earn Zimbabwe at least $45 million per year.

Newsday of February 19, 2016 stated that Zimbabwe had experienced regular outbreaks of the disease in cattle rich regions of Matabeleland and Midlands, which had adversely affected the beef industry. Zimbabwe was hit by beef shortage due to the outbreak of foot and mouth disease (FMD). The country's beef industry has been struggling for over a decade due to FMD outbreaks.

[2] Source:https://www.oie.int/wahis_2/public/wahid.php/Reviewreport

[3] Zimbabwe Agenda for Sustainable Socio-Economic Transformation.

Furthermore, the Financial Gazette of May 18, 2017, reported an outbreak of a tick-borne disease, theileriosis, in Mashonaland East and Central provinces which had claimed hundreds of cattle, leaving villagers distraught. The symptoms of the disease included drop in milk production, depression, weakness and difficulty in breathing for the animal with rapid and shallow breaths. Infected cattle would eventually die after two or three weeks.

1.3 Organizational Structure

Department of Veterinary Services is headed by a Principal Director who reports to the Secretary for the Ministry. Below the Principal Director, there are two Divisional Directors namely; Director Veterinary Services and Director Tsetse Control. (Refer to **Annexure A** for summarized structure of the department). The Division of Veterinary Services operates through 8 Provincial Veterinary Offices, 60 District Veterinary Offices and 800 Animal Health Management Centres. The Division of Tsetse Control has 9 field stations.

1.4 Funding

The Department of Veterinary Services although it is also a revenue collection unit and contribute into the Agricultural Revolving Fund (ARF), its finances are controlled by the Ministry's finance department. The Treasury and the Agricultural Revolving Fund are the sources of funds for the department. The ministry manages all funds of the Veterinary Services in accordance with the approved departmental budgets for administrative and operational issues. **Table 1 and 2** shows consolidated budget and released funds for the department's divisions and revolving fund income collected from 2015 to 2017 respectively.

Table 1 Consolidated financial figures for Veterinary Services (2015-2017)

Year	Budget $	Actual Released $	Percentage Provided %
2015	29 314 000	23 636 634	80.63
2016	21 011 000	18 437 866	87.75
2017	20 290 000	24 853 682	122.49

Financial budget 2015-2017

Table 2. Revolving Fund income collected (2015-2017)

Description	2015	2016	2017
Sales	1 585 0890	2 150 752	1 982 102
Permits	1 763 891	1 617 184	1 458 195
Fees	5 258 804	4 317 650	3 912 057
Gains from fair value –biological assets	68 627		
Total Income	**8 676 402**	**8 085 586**	**7 352 354**

Financial statements for 2015-2017

1.5 Audit Design

The audit design outlines the audit scope, objective, questions and suitable criteria, methodology and reasons for selection of field or areas visits.

1.5.1 Audit Scope

The audit focused on preparedness in the prevention and control of cattle diseases by the Department of Veterinary Services. My audit covered the period January 2015 to August 2018 and the geographical limit was Zimbabwe. The audit covered 5 out of 8 provinces which included Mashonaland West, Manicaland, Matabeleland North, Matabeleland South and Mashonaland Central. These provinces were selected because they are traditional cattle ranching areas, have border posts, and some have areas with tsetse flies. Also, most of these provinces were declared FMD disease red zones by the Department of Cattle and Veterinary Services.

1.5.2 Audit Objective

The audit objective was to assess the extent of preparedness in the prevention and control of cattle diseases by the Department of Veterinary Services**.**

1.5.3 Audit Questions (AQ)

Audit questions are the tools I used to gather audit evidence and formulation of criteria. These targeted important factors and risky areas or systems that were likely to impact on the department's performance. The questions were as follows:

AQ.1 Is the Department of Veterinary Services adequately prepared to prevent and control cattle diseases?

AQ.1. (a)(i) Are vaccination programmes or campaigns for foot and mouth disease, anthrax, rabies, and Newcastle being done?

AQ1 (a)(ii) Does the Department adhere to standard dipping sessions?

AQ 1 (a)(iii). Are adequate inspections and tests being done to prevent entry of diseases into the country?

AQ.1(b) To what extent is the department able to diagnose cattle diseases?

AQ.1 (b)(i) Does the Department carry out sufficient Animal Health Research and Vaccine Production programmes?

AQ2 Are there adequate tsetse eradication control measures?

AQ.2. (i) Does the Department carry out tsetse control surveys and surveillance programmes?

AQ2 (ii) Does the Department have efficient tsetse control interventions and control techniques?

AQ3. Does the Department have enough vehicles, protective clothing and equipment?

AQ4. Does the Department have qualified and skilled personnel?

1.5.4 Assessment Criteria (AC)

The assessment criteria provide reasonable and attainable standard upon which the audit objective can be measured or assessed and addresses specific audit questions. The primary sources of the criteria are the Animal Health Act *[Chapter 19:01]* and Standard Operating Procedures of the department.

AC.1. According to Animal Health Act *[Chapter 19:01]* and Standard Operating Procedures for veterinary epidemiology and disease control, focus must be on surveillance, prevention and control of cattle diseases in the country.

AC1 (a)(i) According to Animal Health Act *[Chapter 19:01]* and Standard Operating Procedures, the department is supposed to control diseases through carrying out vaccination programmes. Two diseases are programmed for mass vaccination campaigns by the department. These are foot and mouth disease and anthrax.

AC1 (a)(ii) Dipping is done in terms of the provisions of the Animal Health Act [*Chapter 19:01*] in conjunction with Section 5 of the Cattle Cleansing Regulations 1993, Section 3 of the Stock Register regulations 1970 and Standard Operating Procedures. This programme is scheduled to be done weekly as from the onset of rains to the end of rains to match the increased tick activity at the time. In the dry season dipping sessions are done every fortnight. These bring the number of sessions to 32 per Dip tank per annum.

AC1 (a)(iii) Section 5 (1) of the Animal Health Act [*Chapter 19:01*] stipulates that the department should prevent entry of diseases into Zimbabwe through inspections, certifications and manning of border posts. Veterinary services are supposed to be found at all border posts in the country to prevent and guard against the introduction of disease from outside.

AC1(b) According to Standard Operating Procedures for Laboratory Diagnostics and Animal Health Research and International best practice, laboratory confirmatory diagnosis/ screening of animal diseases of economic importance like Foot and Mouth Disease, Black leg, Tick borne diseases, internal parasites and diseases which affect both humans and animals (Zoonotic diseases) like Anthrax must be done. According to International best practices, it is a requirement that a nation can only declare absence or presence of a disease upon laboratory confirmation/screening of the disease.

AC1 (b)(i) According to Standard Operating Procedures for Laboratory Diagnostics and Animal Health Research, research services are supposed to be done in animal diseases of economic importance. Vaccine production programmes and specialist extension services are supposed to be done in cattle covering diagnosis sections namely bacteriology, virology, protozoology, helminthology and molecular biology.

AC2 According to Section 5(2)(b) of the Animal Health Act [*Chapter 19:01*], Standard Operating Procedures and Handbook for Tsetse Field Staff, the mission of the department is to eradicate tsetse to promote human and animal health.

AC.2. (i) According to the RBM and Annual reports 2015-2018, the Tsetse Control Division planned to eradicate tsetse from 15 % of the infested area by 2018 to enhance agricultural potential in tsetse cleared areas. Tsetse infested areas cover approximately 30 000km^2 countrywide.

AC2 (ii) According to Standard Operating Procedures for Tsetse Control and Handbook for Tsetse Field Staff, different methods of tsetse control are used with different degrees of success. These control strategies being used to eradicate tsetse are either stationary or mobile bait methods which include use of targets, cattle dipping, ox bait cattle and traps for surveillance. Other strategies include ground spraying, sterile insect techniques and traffic control barriers.

AC3 According to Standard Operating Procedures, cattle and veterinary workers are supposed to be issued with protective clothing twice a year (work suits, gumboots, overalls, safety shoes, socks etc.) and camping equipment for tsetse workers is supposed to be (tent, galvanised iron bucket, a stretcher bed, mosquito net, water bag and a canvas bath) and is to be replaced as and when it gets worn out. Other equipment needed includes rifles, camping shovels, hoes etc. Each work station is supposed to have at least a vehicle.

AC4 According to the Department of Veterinary Services, key personnel required are supposed to be recruited in accordance with the Approved Staff Establishment by Public Service Commission. To enhance successful implementation of department programmes, the need for adequate, appropriately qualified and skilled personnel is essential.

1.6 Audit Methodology

The audit team applied the following methods of collecting data:

1.6.1 Interviews

These were carried out with key personnel from Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement and other stakeholders. The interviews were used to collect evidence on how cattle and veterinary services were being managed as well as corroborating information obtained from documentary review for the purposes of evaluating the services. **Annexure B** shows the list of interviewees.

1.6.2 Documentary Review

Documents[4] were reviewed to gather information on Cattle and Veterinary services. The following documents were reviewed. **Table 3 refers.**

[4] Review of statistics of cattle census and diseases cases was based on provided statistics which however the Department said was somehow understated in some cases as some farmers were not reporting diseases cases and deaths and or not registering or updating their stock records. This would impact on the accuracy of presented statistics.

Table 3: Documents Reviewed

Document	**Purpose**
Animal Health Act *[Chapter 19:01]* Public Health Act *[Chapter15:09]*	**Enable me to:** Understand the organisation's mandate and function.
Organisational Structures	Appreciate management levels and reporting structures.
Procedure manuals (Standard Operating Procedures), Prevention of Foot and Mouth Disease Regulations of 1987, Prevention of Anthrax Regulations of 1971, Cattle Cleansing Regulations 1993, Stock Register regulations 1970.	Understand the prescribed way of doing business.
Financial Statements (period 2015-to 2017)	Assess how cattle and veterinary services are funded.
Minutes (Doma Tsetse Field Station)	Understand the resolutions made by senior management in relation to cattle and veterinary services.
ZIMASSET Document, National Cattle Policy	Understand the Government expectations and targets with regards to cattle and veterinary services.
Annual reports for the sampled Provinces, Districts (2015 to 2017).	To analyse information on service provision

1.6.3 Inspections

Inspections were carried out in sampled areas in Mashonaland West, Mashonaland Central Matabeleland North and South to confirm how veterinary service issues on cattle diseases control and prevention were being managed. Refer to **Annexure C** for areas visited.

CHAPTER 2

2.1 SYSTEMS DESCRIPTION

This systems description outlines the roles and responsibilities of the key players or stakeholders in the prevention and control of cattle diseases. The description highlights who is responsible for what, how the system should work. It also details the processes or systems and how the audited systems and activities are expected to operate.

2.1.1 Roles and Responsibilities of Key Players

This highlights the role the Department and other key stakeholders play or assist in the selected audit area.

Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement.

According to Strategic Plans 2015-2018, the Ministry is responsible for the management and monitoring of the operations of the Department of Veterinary Services. They administer the Agriculture revolving fund and allocated funds from Treasury. The Ministry provides the regulatory framework and approves strategic plans for the department (Results Based Management).

Department of Veterinary Services

According to Strategic Plans 2015-2018, the department is responsible for:

- provision of strategies and mechanisms for the eradication and prevention of the spread of animal pests and diseases in the country.
- Administering the dipping, vaccination and animal diseases and surveillance programmes.
- protecting consumers from diseases that are transmitted from animals and animal products through imports and exports like meat, milk, eggs etc. by carrying out inspections.
- provide services in animal disease screening, laboratory based animal disease definitive diagnosis and research into animal diseases of economic importance.
- providing cattle extension, technical and advisory services to the agricultural community, providing coordination in the development of the cattle sector, providing regulatory and specialist services to the cattle industry and capacity building and development.
- Implementation of measures against the tsetse fly and as well as undertake operational research to improve techniques used to eradicate tsetse.

Department of AGRITEX

This department is responsible for providing cattle extension services through education of farmers.

Zimbabwe Republic Police

The Police is responsible for verifying ownership of cattle through inspection of cattle movement control permits and helping the department to mount road blocks.

Farmer Unions (e.g. Zimbabwe Farmers Union and Commercial Farmers Union)

These provide complementary training and equipping the farmers on cattle diseases control. They also help farmers to source and advise them on cattle.

Donor Community (OIE/FAO/SADC/EU/COMESA etc.)

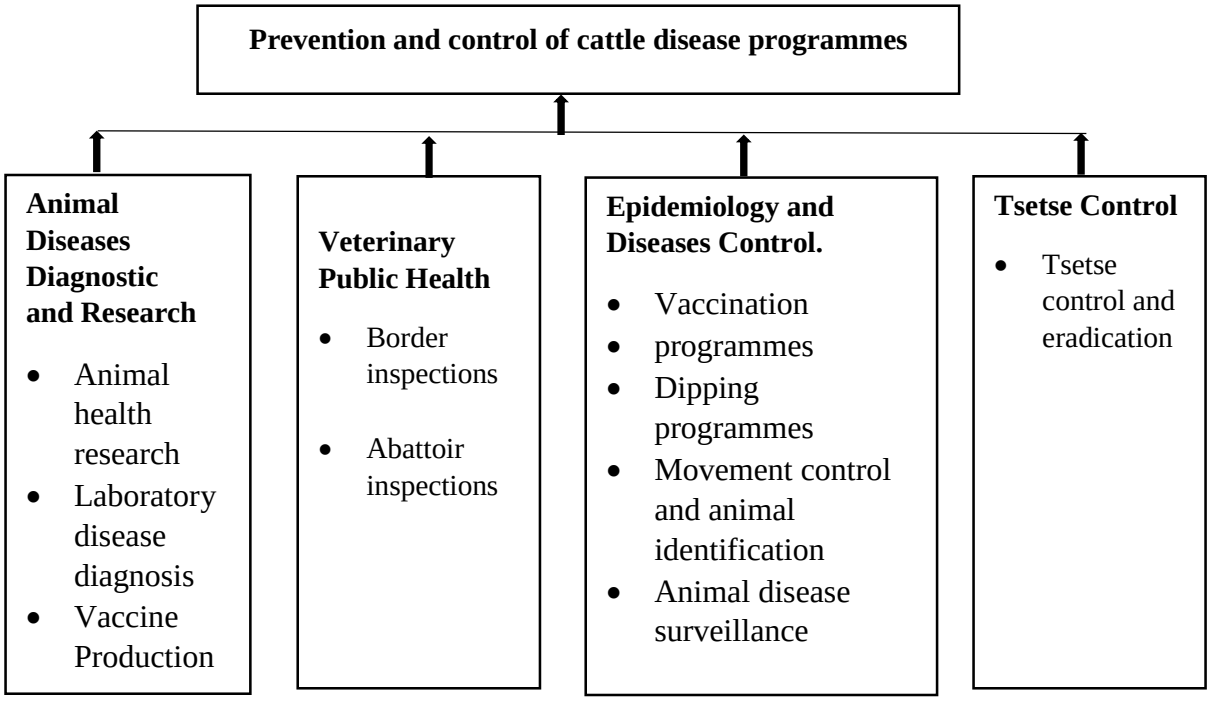
These assist through provision of resources to use in disease prevention and control. They provide knowledge and best ways of disease control through equipping laboratories, research and provision of vaccines.

2.1.2 Process Description

The process description describes processes the Veterinary Services Department undergo in cattle diseases prevention and control. The process includes animal health research which is paramount in establishing existence of cattle diseases.

The Department of Veterinary Services carries out animal health research to identify diseases that affect cattle with the aim of establishing prevention and control measures. These prevention and control measures aim at reducing cattle mortality and diseases outbreaks. The chart below shows the general prevention and control measures instituted by the department.

Chart 1: Prevention and control measures of cattle diseases instituted by the department



Animal health research

This provides research services and diagnosis in animal diseases of high economic importance and carrying out developmental projects like vaccine production programme and specialist extension services in poultry, pigs, beef cattle, dairy cattle and fisheries.

- **Laboratory Disease Diagnosis**

  According to Standard Operating Procedures for Laboratory Diagnostics and Animal Health Research and World Organization for Animal health (OIE) guidelines, diseases diagnosis/ screening must be done on diseases of major economic and zoonotic importance. These include Foot and Mouth Disease, Black leg, Tick borne diseases, internal parasites and diseases which affect both humans and animals (Zoonotic diseases) like Anthrax. Testing of diseases is done in laboratories using specific equipment and chemical reagents. Laboratory testing turnaround times for diseases of major economic and zoonotic importance ranges from 1 day to 6 weeks. According to World Organization for Animal health (OIE) guidelines, it is a requirement that a nation can only declare absence or presence of a disease upon laboratory confirmation/screening of the disease. Disease control measures can only be carried out after an accurate laboratory diagnosis of the diseases involved.

- **Vaccine Production**

  According to Standard operating procedures for Laboratory Diagnostics and Animal Health Research, vaccines are supposed to be produced by the Veterinary Services for diseases of economic importance in its laboratories. Vaccines are periodically produced targeting diseases caused by bacteria, virus, parasites, helminth and molecules.

Prevention and control of diseases

These are programmes and strategies aimed at preventing the introduction and spread of diseases and pests into the country. They include veterinary epidemiology and public health services.

- **Veterinary epidemiology and disease control**

It focuses on surveillance, prevention and control of diseases in the country. There are programmes that have been put in place to control the diseases which include dipping, vaccination, animal diseases surveillance, movement control and animal identification and animal health extension programmes.

a) Dipping

Dipping guidelines stipulates that tick control should be done thoroughly and effectively since tick borne diseases account for 75% of cattle losses in Zimbabwe. Dipping is done in terms of the provisions of the Animal Health Act *[Chapter 19:01]* as read with Section 5 of the Cattle Cleansing Regulations 1993 and Section 3 of the Stock Register regulations

1970. The objectives of the dipping Programme is to reduce the incidences of ticks and tick-borne diseases in cattle and goats as well as losses incurred due to tsetse fly caused trypasonomiasis[5] disease. Dipping methods include use of the plunge dipping, spraying and pour-on. Government coordinates and regulates the dipping program with about 4000 dip tanks countrywide. The program is supposed to be done weekly as from the onset of rains to the end of rains to match the increased tick activity at the time. In the dry season dipping sessions are every fortnight. Hence an average of 32 dipping sessions is supposed to be done annually per dip tank. A1 and communal farmers contribute $2/ animal per year as dipping fee. During the dipping process dipping assistants verify each stock owner's number of animals against the record on the stock card and update stock card accordingly. A2 or commercial farmers do not contribute the dipping fee as they conduct their own dipping. The duty of the department to these farmers is only to monitor whether or not there is compliance with dipping regulations.

b) Vaccination

There are 2 diseases programmed for mass vaccination campaigns under the Veterinary epidemiology and disease control for cattle. These include foot and mouth and anthrax.

- **Foot and Mouth Disease(FMD)**

FMD control is done in terms of the provisions of the Animal Health Act *[Chapter 19:01]* as read with Prevention of Foot and Mouth Disease Regulations of 1987. The objective of FMD vaccination is to suppress virus circulation within the infected population and prevent further spread. This is achievable through correct vaccine administration covering at least 90% of the target census. FMD is a highly contagious viral disease of socio-economic importance. In the face of outbreak there is reduced performance of cattle especially cattle which is the main species affected in Zimbabwe. The disease is resident in wild buffalo which acts as the reservoir or host for the disease putting all cattle in close proximity to national parks and conservancies containing buffalo at risk. The methods of controlling FMD includes game fences, vaccination of cattle population at risk and cattle movement controls. Surveillance is also done through inspections at dip tanks, individual farms, sale pens, abattoirs and feedlots and all other cattle holding infrastructure. Vaccinations are supposed to be carried out twice a year in red zones which include areas near game parks and conservancies.

- **Anthrax**

Anthrax vaccination is done in terms of the provisions of the Animal Health Act [*Chapter 19:01*] as read with Prevention of Anthrax Regulations of 1971. This programme is an annual programme aimed at preventing the outbreak and spread of the disease in cattle and its transmission to humans who are largely exposed when they consume anthrax infected

[5] A disease caused by tsetse fly to livestock

or contaminated meat. About 1.8 million cattle are targeted for vaccination between March and August of each year. The programme is provided only to anthrax prescribed areas or any other area where an outbreak has been confirmed at no cost recovery.

The objective of Anthrax vaccination is to prevent occurrence of the disease within a population. This is achievable through correct vaccine administration covering at least 90% of the target census.

c) Animal diseases surveillance

This entails regular visual inspections and collection of laboratory samples for disease confirmation and status for the country. Monthly inspections are scheduled in the smallholder sector whilst quarterly inspections are scheduled for the commercial enterprises. Cattle inspections are done in terms of Section 21 of the Animal Health Act *[Chapter 19:01]* which authorizes the call-up of animals for inspection. The objective of carrying out an inspection is to facilitate early detection of cattle diseases, pests and adherence to animal health regulations. According to departmental annual plans (2015-2017), they were supposed to inspect 100% in A2 farming areas and at least 75% in the communal sector.

d) Movement control and animal identification

This is done in accordance with the provisions in the Animal Health Act *[Chapter 19:01]* as read with animal Health (Quarantine Areas) regulations 1976 and Movement of Cattle and Pigs Regulations 1984. The objective is to prohibit unauthorized movement. They operate a cattle movement control system which helps to ensure that diseases of animals do not spread unchecked. All cattle are branded to identify them to province, District, dip tanks, and zone of origin. All cattle movements are required to be accompanied by a veterinary movement permit as well as Zimbabwe Republic Police (ZRP) clearance certificate to limit the risk of spreading disease from one area to another. Road blocks are supposed to be mounted on the roads to inspect all live animals and animal products and check for the authority for such a movement. These road blocks are done with assistance from ZRP. In case of unauthorized movement, the owner is prosecuted and a permit is issued for movement back to place of origin by motor transport. In case of a movement of infected animals, the owner is prosecuted and there is cause for the destruction of the animals and burning of all suspected animal products (infectious things) as per the disease under control from infected area.

e) Animal Health Extension Programme

This is a farmer education programme aimed at enriching all farmers with the appropriate and relevant cattle farming knowledge. The programme is done through demonstrations in different media, scheduled farmer training sessions, field days and recognition of world days such as the World Veterinary Day and the World Rabies Day.

Veterinary Public Health

Veterinary Public Health (VPH) is aimed at protecting consumers from diseases that are transmitted from animals and animal products like meat, milk, eggs etc. in accordance with Section 97 of the Public Health Act *[Chapter 15:09]*. It protects the country's cattle industry from diseases which could be introduced in Zimbabwe through importation of animals and animal products. These functions are carried out through inspection of commercial abattoirs, processing plants countrywide and manning of border posts to control the movement of cattle and meat products in and out of the country. VPH offices and operations are therefore supposed to be found at all major abattoirs within the country and border posts.

Tsetse Control

According to the Animal Health Act [*Chapter 19:01*] Section 5(2)(b), Standard Operating Procedures and Handbook for Tsetse Field Staff, tsetse fly is a pest that causes diseases in animals (trypasonomiasis) and in humans (sleeping sickness). The mission to eradicate tsetse is to promote human and animal health. Different methods of tsetse control are used with different degrees of success. This include elimination of game animals by hunting, clearing tsetse infested bush, application of persistent insecticide to tsetse resting places, use of artificial baits and insecticide treated targets and use of insecticide treated cattle. These control strategies being used to eradicate tsetse are either stationary or mobile bait methods and include use of targets, ground spraying, sterile insect techniques, cattle dipping and traffic control barriers.

- **Odour-baited, insecticide impregnated target deployment and maintenance**

  Odour-baited, insecticide impregnated target are used to eradicate tsetse flies. It exploits the visual and olfactory[6] cues of tsetse. The targets are placed in either transects or grids depending on the terrain at an average density of 4 per square km and are maintained after 6 months. The odour-baited, insecticide impregnated target kills tsetse through direct conduct with the black treated part of the cloth. The target cloths are placed on hardware at an interval of 200m in transects and 500m in grids depending on the terrain.

- **Tsetse Surveys using the Trap Technique**

  The trap used in tsetse survey operation is called Epsilon trap. It exploits a combination of olfactory and visual stimuli of tsetse fly. It is stationary bait for sampling tsetse flies. The survey technique is used to determine the presence, abundance and distribution of tsetse in a given locality. A survey team selects a suitable habitat for deployment of an odour-baited epsilon trap at a density of 1 trap/4km^2.

[6] These are the sensing body parts of a tsetse fly

- **Tsetse Traffic Control Gates**

  Tsetse species are easily attracted to moving traffic (vehicles, cyclists, pedestrians and scotch carts) and often land on or enter inside slow moving vehicles, or land on the backs of cyclists and pedestrians. Tsetse can therefore be transported long distances enabling them to reinvade cleared areas. The spread of tsetse into reclaimed areas will result in trypasonomiasis[7] incidences. Tsetse traffic control gates are used to minimise the spread of tsetse by traffic to previously cleared areas. The traffic gates are strategically located on major roads along the tsetse front. The control of tsetse flies using traffic control gates is a regulatory aspect, which is in accordance with the Animal Health Act [*Chapter 19.01*]. This is done by inspecting and catching tsetse in traffic coming from tsetse–infested areas. Vehicles are then sprayed with an aerosol insecticide to kill and displace all flies hiding inside.

- **Insecticide treated Cattle (Dipping)**
  This method simply replaces the acaricide (triatic) for tick control with a special acaricide[8] for tsetse control (deltamethrin[9]). As the tsetse feed or attempt to feed on the cattle, they pick up a lethal dose of insecticide. The length of time the insecticide remains active depends on the dose rate and method of application which is usually between two weeks and one month. This is normally done to cattle on the margins of tsetse infested areas to prevent spread.

- **Ground spraying**
  This technique depends on the fact that tsetse rest in well-defined places during the hot dry season. The insecticides are then applied on those resting places or dry season habitats for example rivers, tree boles, fallen logs and other resting places. Spraying is done using knapsack sprayers with supporting labour and transport.

- **Sterile insect technique**
  This technique involves sterilization of male tsetse through radiation in order to suppress population growth or reducing birth rate. This method is used when the population of the insect had been reduced to minimum levels and its aim would be to completely eradicate the insect.

- **Sequential Aerial Techniques**
  This technique makes use of an aeroplane to spray insecticides. Spraying is done during the night and targets killing the adults in the initial stage and later those in the immature stages (pupa).

[7] A disease transmitted by tsetse flies.
[8] Means chemicals used for dipping cattle
[9] It is a special type of acaricide that is used to eliminate both ticks and tsetse fly. This is normally used in tsetse infested areas and those around.

Vehicles, Protective Clothing and Equipment

According to Standard Operating Procedures, veterinary workers are supposed to be issued with protective clothing twice a year (work suits, gumboots, overalls, safety shoes, socks etc.) and camping equipment for tsetse workers is supposed to be (tent, galvanised iron bucket, a stretcher bed, mosquito net, water bag and a canvas bath) and is to be replaced as and when it gets worn out. Other equipment needed includes rifles, camping shovels, hoes etc. Each work station is supposed to have at least a vehicle.

CHAPTER 3

3. FINDINGS

In this Chapter, I start by presenting my findings on the outbreaks of diseases and deaths of cattle in Zimbabwe (paragraph 3.1). This is followed by a presentation of the shortcomings I have identified in the main operations of the Veterinary Services Department. The operations are covered as follows:

- Prevention and control of diseases (paragraph 3.2);
  - Foot and mouth disease prevention strategies (paragraph 3.2.1)
  - Vaccination against anthrax (paragraph 3.2.2)
  - Dipping programme- preventing tick borne diseases (paragraph 3.2.3)
  - Eradication of tsetse flies- preventing trypasonomiasis (paragraph 3.2.4)
- Veterinary public health inspections and surveillance of cattle diseases (paragraph 3.3)
- Laboratory diseases diagnostics (paragraph 3.4);
- Animal health research and vaccine production (paragraph 3.5);

I complete the chapter by presenting my findings regarding the underlying administrative causes to the problems in the operations of the Department in paragraphs 3.6 and 3.7. More specifically I covered:

- Availability of financial resources (paragraph 3.6)
- Protective clothing and camping equipment (paragraph 3.7.1);
- Availability of vehicles and access to equipment (paragraph 3.7.2); and
- Skills availability and qualifications of staff (paragraph 3.7.3)

3.1 Outbreak of diseases and deaths of cattle

Review of Department of Veterinary Services annual reports (2015 -2017) indicated that there were significant losses of cattle due to various diseases. For instance, from the annual reports, audit noted that 166 997 cases of diseases in cattle were reported in the country between the period 2015 and May 2018. Of the cases reported, audit gathered that a total of 22 895 cattle died of the diseases. Although reported cases of diseases had declined from 58 181 in 2015 to 27 875 in 2016, there was an upsurge in reported cases and deaths in 2017. The report indicated that the upsurge was attributed to increased outbreaks of Foot and Mouth Disease (FMD). **Table 4** provides statistics on the cases and deaths reported during the period.

Table 4: Analysis of disease cases and deaths of cattle (2015 to May 2018)

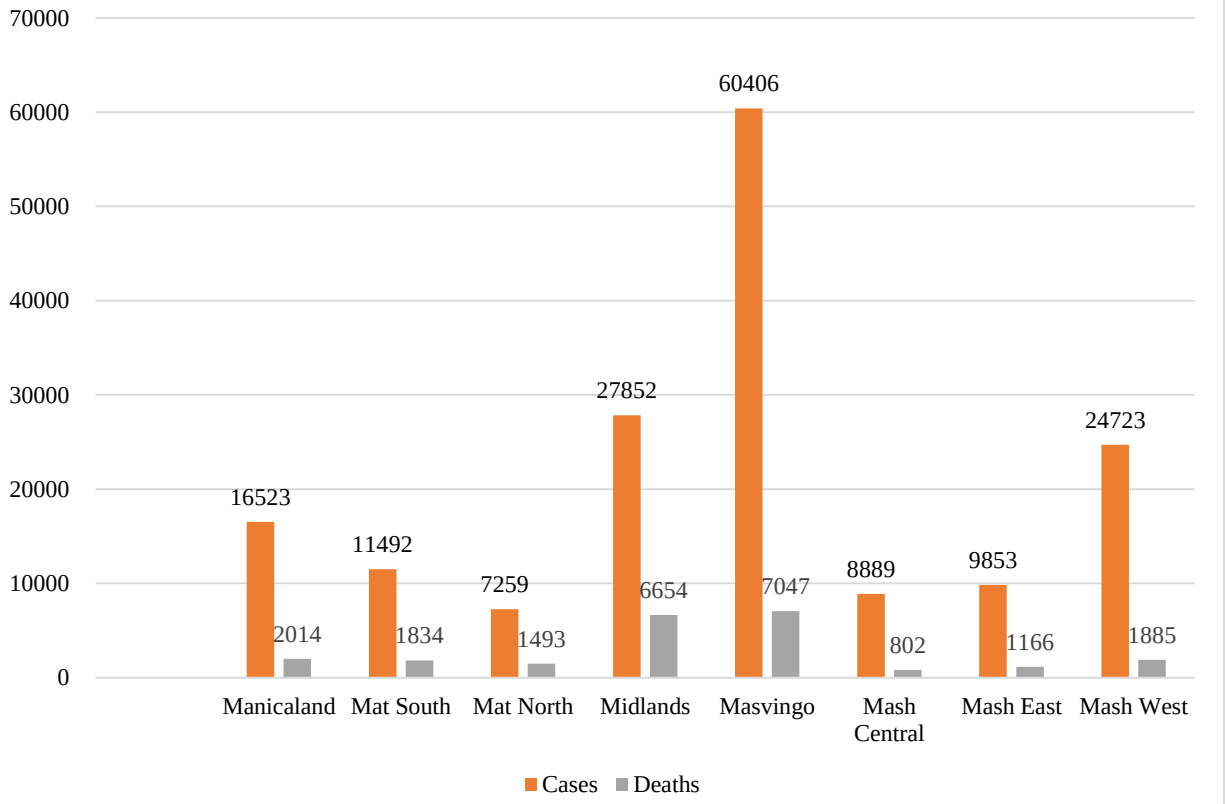
Year	Number of Cattle with diseases	Number of Deaths of Cattle
2015	58 181	4 781
2016	27 875	6 145
2017	68 043	10 843

2018 (May)	12 898	1 126
Total	**166 997**	**22 895**

Source: Annual Reports (2015 to May 2018)

Further analysis of the statistics showed that outbreaks of diseases were spread across the 8 provinces in the country. Analysis of **Graph 1** reveals that Masvingo recorded the highest number with 60 406 (68%) of cases of diseases reported followed by Midlands and Mashonaland West provinces respectively. These areas were mostly affected by FMD. Matabeleland North province recorded the least cases with 7 259 (4%) in the period 2015 to May 2018. However, audit noted that these figures were supposedly grossly understated. This was confirmed during interviews with veterinary officials in provinces visited who stressed that there were some weaknesses in the recording of disease cases and that some farmers were neither reporting disease cases nor deaths.

Graph 1. Analysis of disease cases and deaths by Province



Source: Annual Reports (2015 to May 2018)

Review of annual and monthly reports (2015 to May 2018), interviews with department officials, and inspections done revealed that increases in disease cases and deaths of cattle was caused by inadequate implementation of prevention and control programmes which included vaccination, dipping and animal diseases surveillance programmes. Furthermore, the documents indicated that the effectiveness of these disease control and prevention programmes have been compromised by lack of prioritising the provision of operating budget, investment in facilities and equipment and limitations on the number of staff. This had resulted in the country not being able to export beef to

regional and international markets. For example, the European Union had banned imports from Zimbabwe since 2007 which were earning the country at least USD 45 million per year in nominal prices. (The issue of resources is further explained in paragraphs 3.6 and 3.7 of the report).

Management response:

The department agreed to the observation and indicated that this was primarily due to resource constraints affecting the department. They stated that the key prevention and control programs like FMD rely on government funding which had been very limited for the period under review. The department highlighted that the best way to manage animal diseases is by adequately investing in disease prevention programs and this was not possible as the resources availed were too little to make significant impact and in most cases came too late.

3.2 Prevention and control of diseases

According to the Department of Veterinary Services Standard Operating Procedures (SOPs), the department had instituted disease prevention and control mechanisms which included vaccination programmes for diseases of economic and zoonotic importance. The vaccination programmes include Foot and Mouth Disease (FMD) and anthrax diseases. These diseases were targeted as they were impediments to cattle productivity and access of meat products to regional and international markets.

3.2.1 Foot and Mouth Disease (FMD) prevention strategies

FMD control is done in terms of the provisions of the Animal Health Act *[Chapter 19:01]* in conjunction with the Prevention of Foot and Mouth Disease Regulations of 1987. The objective of FMD vaccination is to suppress virus circulation within the infected population and prevent further spread. This is achievable through vaccination of at least 90% of the target census. The Department of Veterinary Services' FMD Vaccination Programme states that vaccination against the disease must be done twice per year.

My review of departmental annual reports (2015-2017), FMD prevention and control programme documents and interview with veterinary officials revealed that the department was not doing regular FMD vaccinations as per their plans in risk zones. For instance, in 2015, Bikita, Chipinge, Gokwe South and Beitbridge districts managed to do only one round out of the required two routine vaccinations and in 2016, Lupane and Nkayi managed only one round. According to annual reports, cattle in areas surrounding infected zones like Gonarezhou National Park, Hwange National Park and Gokwe had not yet been vaccinated against FMD at the time of audit (June 2018).

Furthermore, according to Tsholotsho District annual reports for the period 2015 to 2017 in Matabeleland North province, of the planned 35 000 vaccinations per year, the district had managed none since 2015. This situation was predominant in all districts visited. In addition, review of provincial annual reports indicated that Manicaland Province did not conduct bi-annual vaccination programmes in risk zones like Buhera District in 2015 and 2016. Meanwhile, in

Chipinge District, vaccinations were done based on available vaccines and not cattle census in the area. In the period 2015-2017, 86 020; 59 832 and 152 220 cattle were vaccinated respectively.

My audit established that failure by the department to conduct vaccination programmes was caused by shortage of vaccines. The department had no emergency response strategy in place to deal with the outbreaks as there was no separate emergency fund to maintain emergency stocks of FMD vaccine both at province and head office. During the period under review, audit established that an average of 61% of the required vaccines per year was not made available hence affecting vaccination programmes. **Table 5** highlights the discrepancy between availed vaccines against annual requirement.

Table 5. Analysis of planned and availed vaccines for FMD (2015 to May 2018)

Year	National Required Vaccines	Vaccines Availed	Vaccines Shortfall	Percentage Variance
2015	2 040 000	920 219	1 119 781	55%
2016	3 410 700	960 225	2 450 475	72%
2017	2 404 000	1 192 697	1 211 303	50%
Total	**7 854 700**	**3 073 141**	**4 781 559**	**61%**

Source: Annual Reports 2015 to May 2018

Inadequate implementation of FMD vaccination programmes resulted in spread of the disease in all the country's provinces. In the period 2015 to May 2018, a total of 53 026 FMD cases were recorded in all the 8 provinces. Masvingo Province recorded the highest number of FMD cases with 33 799 (63.74%), followed by Midlands Province with 15 155 (28.58%) cases. Of the 53 026 cases reported, 5 701 resulted in deaths throughout the country. **Table 6 refers**.

Table 6. Breakdown of FMD cases and deaths by Province

Province	Total Cases Reported	% Cases per province to total cases reported	Total Deaths	% Deaths to cases reported
Manicaland	313	0.59	12	3.83
Mashonaland East	6	0.01	0	0.00
Mashonaland West	6	0.01	0	0.00
Mashonaland Central	0	0.00	0	0.00
Masvingo	33 799	63.74	465	1.38
Matabeleland South	3 005	5.67	3	0.01
Matabeleland North	742	1.40	3	0.40
Midlands	15 155	28.58	5 221	34.45
Total	**53 026**	**100**	**5 701**	**10.75**

Source: Diseases trend reports 2015 to May 2018

On the other hand, departmental annual reports also indicated that spread of FMD to most Provinces which were disease free like Mashonaland East, parts of Manicaland, Masvingo, and Mashonaland Central were caused by inadequate implementation of cattle movement controls. The Animal Health Act *[Chapter 19:01]* as read with Animal Health (Quarantine Areas) Regulations

of 1976 and Movement of Cattle and Pigs Regulations of 1984 requires that all cattle movements must be accompanied by a veterinary movement permit to limit the risk of spreading disease from one area to another. From interviews with officials in provinces visited it was indicated that some cattle were being moved without clearance from the police as well as cattle movement permits from the Veterinary Services Department. For instance, a Cattle Destruction and Disposal Order from Manicaland Province indicated that a farmer from Gambadziya resettlement area unlawfully moved 8 cattle infected with FMD without a police clearance nor a permit from Veterinary Services. This also happened in Rushinga in Mashonaland Central Province where 5 cattle infected with FMD were moved to Shamva District.

Furthermore, an FMD investigation report dated May 30, 2018 for Buhera District (Manicaland) indicated that their cattle were sharing grazing areas with those in Gutu District (Masvingo) along the boundaries. Gutu District was declared as FMD red zone and failure to control movement of cattle along the boundaries may have resulted in the spread of FMD to Buhera District in the year 2017. Interviews with veterinary officials revealed that during the period when Gutu first recorded FMD outbreaks, vaccination programmes to prevent spread of the disease were only confined to Gutu District leaving out neighbouring districts such as Buhera vulnerable to outbreak of FMD.

In addition, provincial heads in Matabeleland North and Manicaland stated that non-availability of fence boundaries between farms as well as game parks to separate cattle and buffalos were causing serious outbreaks of FMD. The reports indicated that Zimbabwe now resembled "one classroom block" with no fenced farm boundaries. The country used to have internal boundaries especially commercial farms which were fenced to control movement of animals from one farm to the other. Fences that used to restrict movement of buffaloes into cattle grazing areas were also not being maintained and, in most cases, non-existent. In Matabeleland North Province, in Hwange Game Park, the fence was not being maintained to control movement of wildlife into communities and no evidence was availed showing that the department had any plans to rectify the problem. In Manicaland Province, especially in Chipinge District, mixing of cattle and buffalos was a challenge as fence boundaries separating Save Conservancy from villages was vandalized and not replaced for approximately more than 15 years. Apart from this, documentary review and interviews with officials in Mashonaland Central indicated that since June 2018, the province reported for the first time FMD cases in Rushinga and Mt Darwin Districts. The disease was suspected to have come from Mozambique as there were no fences to control movement of cattle between the two countries.

3.2.2 Vaccination against Anthrax disease.

Anthrax vaccination is done in terms of the provisions of the Prevention of Anthrax Regulations of 1971. Cattle in risky areas are vaccinated once a year at no cost to the farmer. This is an annual programme aimed at reducing disease transmission.

From review of annual and monthly reports 2015- May 2018, audit noted that regular annual vaccination programmes of anthrax were not being done. **Table 7** shows planned, actual vaccinations and treatments conducted during the period under review. The department did not manage to carry out any vaccination as planned in the years 2015, 2016, 2017 and up to August 2018.

Table 7: Analysis of planned and actual vaccination programmes for Anthrax

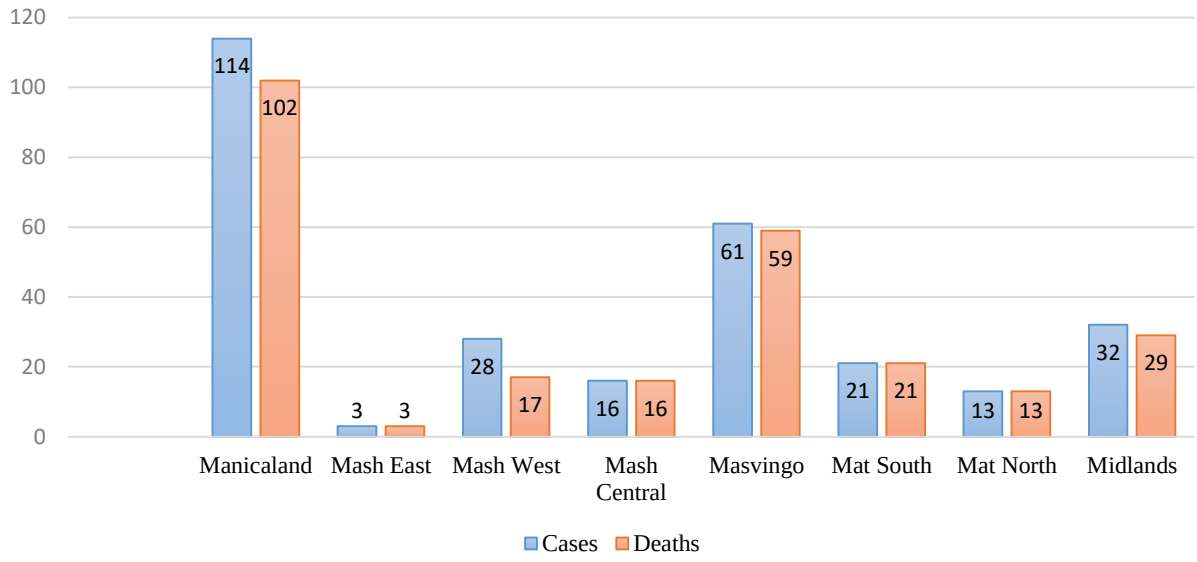
	2015	2016	2017	2018 (August)
Planned	1 777 100	1 722 500	1 800 000	1 800 000
Actual	Nil	Nil	Nil	Nil

Source: Annual Reports 2015-August 2018

Audit gathered that failure by the Veterinary Services to conduct vaccination programmes as had been planned was caused by non-availability of vaccines. Review of budgets indicated that the department had not been prioritizing procurement of anthrax vaccines (refer to Section 3.6 for further details).

According to the department's annual reports for the period 2015-2017, failure by the Veterinary Services to conduct anthrax vaccination programme resulted in outbreaks of the disease and death of cattle across the country. Most of the anthrax cases and deaths were reported in Manicaland followed by Masvingo Province. From analysis of **Graph 2,** audit gathered that approximately more than 90% of anthrax cases ended in deaths.

Graph 2. Analysis of Anthrax cases and death per Province 2015-2017.



Source: Annual Reports 2015-2017

Management response:

The department concurred with the observation and stated that they had been failing to procure adequate amounts of vaccine as and when required due to lack of funding. The department has also been failing to avail adequate vaccines to control the outbreaks in time when outbreaks occur. It was now relying more on movement controls. Animals are being identified to dip tank and farm of origin using hot iron branding to facilitate early detection of illegal movements. Animals that are moving illegally from infected areas to clean areas are being destroyed and disposed of through burning to prevent the spread of diseases.

3.2.3 Dipping programme preventing tick borne diseases.

The Animal Health Act *[Chapter 19:01]* read in conjunction with Section 5 of the Cattle Cleansing Regulations 1993, Section 3 of the Stock Register regulations 1970 and Standard Operating Procedures stipulate that it is ideal to do weekly dipping from November to March, fortnightly dipping in April, May, September and October and the cold season June to August dipping interval can be reduced to once per month. This gives an average of thirty-two dipping sessions per dip tank per year.

Review of the department's annual and monthly dipping reports for the period 2015 to May 2018 indicated that dipping sessions conducted were inadequate throughout all the 8 Provinces**. Table 8** shows a national analysis of planned versus actual dipping sessions achieved during the period 2015 to May 2018. The analysis showed that the department missed its planned targets by an average of 23% each year.

Table 8. Planned and Actual dipping sessions per year from 2015 to May 2018

Year	Planned	Actual	% of the Target Missed
2015	30 652	27 737	10%
2016	47 173	36 858	22%
2017	49 699	41 081	17%
May-18	31 921	17 336	46%
	159445	**123012**	**23%**

Source: Annual and Monthly Dipping reports 2015 to May 2018.

From my assessment of dipping sessions done in all the provinces I visited, I noted that dipping was not being adequately done. Dipping sessions were more erratic during the period, May to July 2018 in all the provinces visited.

In my review of annual reports (2015-2017) and interviews with officials at head office, provinces and in districts visited, I gathered that failure to conduct adequate dipping sessions was mainly caused by shortage of dipping chemical and water at some dip tanks.

Dipping chemical and fees collection

To cushion procurement of dipping chemical, farmers are required to contribute $2 per animal per year as dipping fees. **Table 8** shows revenue that was collected nationwide from farmers as dipping fees for the period 2015 to May 2018. Analysis of the table indicates that dipping fees collected had been on a downward trend from 2015 to 2017 declining from 49% to 35%.

Table 9: Analysis of dipping fees collected for the period 2015 -2017

Year	Cattle Census	Expected collection of dipping fees per year $	Actual collections of dipping fees per year $	Percentage collection
2015	5 359 055	10 718 110	5 237 692	49%
2016	5 313 874	10 627 748	4 313 650	41%
2017	5 537 317	11 074 634	3 912 056	35%

Source: Revenue Returns

Interviews held with officials from the department highlighted that the downward trend was due to cash crisis in the country and resistance from some farmers. The department, in 2017, after the introduction of plastic money, did not have swipe or Eco cash platforms which also limited farmers from paying their fees. My engagement with farmers at one of the dip tanks visited in Bubi District in Matabeleland North, revealed that some farmers were no longer motivated or willing to pay their dipping fees as the dipping programme had become erratic due to non-availability of dipping chemical. **Table 10** shows dipping chemical distributed nationwide during the period 2015 to 2017. The department managed to distribute 49%, 36% and 56% in the years 2015, 2016 and 2017 respectively which was far below the requirement. In 2018, from January to May, the department only managed to distribute 5 555kg of acaricide nationwide instead of approximately 139 725kg required for the period. My interviews with officials highlighted that shortage of acaricide was a major contributor to continued outbreaks of tick-borne diseases.

Table 10: Analysis of dipping chemical distributed from 2015-2017

Year	Average requirement of Dipping chemical per year (kgs) for 3726 dip tanks	Dipping chemical distributed per year (kgs)	Percentage Distribution
2015	335 340	165 720	49%
2016	335 340	121 462	36%
2017	335 340	187 673	56%
Total	**1 006 020**	**474 855**	**47%**

Source: Dipping chemical Reports 2015-2017

According to the Department's National Tick Strategy Report, as from September 2017, the two suppliers who were supplying the department with dipping chemical stopped supplying the product due to their production challenges and this affected the national dipping programme. Besides shortage of the chemical, interviews held with officers at Animal Health Management Centres in districts visited revealed that they suspected that some categories of ticks particularly the blue tick had developed resistance to the chemical (Amitraz[10]) used. The department has been using this type of acaricide for more than 10 years and there was no evidence to suggest that research activities had been done to establish whether or not ticks had developed some resistance. Farmers in Bubi District suspected that the dipping chemical was not effective as they noticed ticks not falling from cattle after dipping.

My audit also gathered through interviews with workers at a farm belonging to the Veterinary Department in Umguza District in Matabeleland North that acaricide applied through pour-on[11] was not effective in eradicating ticks as their herd of 240 cattle were tick infested despite conducting weekly application of acaricide. However, veterinary officials at the provincial office dismissed the allegations of ineffectiveness of pour on and suspected improper measurements of the acaricide during the application process by the workers. **Picture 1** shows one of the 240 herd of cattle that was infested with ticks especially between the legs.

[10] Amitraz –a type of dipping chemical being used by the department for dipping

[11] Pour-ons are concentrated dipping chemical which are applied topically to the animal's skin in small doses.

Picture 1: One of the herd of cattle infested with ticks

Source: Photograph by Audit team.

Infrastructure at dip tanks.

The Department of Veterinary Services planned to construct and rehabilitate dip tanks to enhance effectiveness of the dipping programme. From my review of annual reports for 2015 to 2017, I noted that there were 3 726 dip tanks in the country, 2 637 (70.77%) of which needed repairs for them to function properly. **Table 11** shows distribution of existing dip tanks in the country, additional required dip tanks as well as the total number of dip tanks that needed rehabilitation. Manicaland Province was the most affected with 89.52% of its dip tanks needing rehabilitation followed by Matabeleland North, Midlands, Mashonaland West, Mashonaland East, Matabeleland South, Masvingo and Mashonaland Central Province respectively. Analysis of data revealed that

all the 8 provinces needed additional dip tanks and Mashonaland Central Province topped the list with 60. According to interviews with veterinary officials, Mashonaland Central had more resettled farmers than other provinces.

Table 11: Analysis of the status and required dip tanks in the Provinces

Province	Existing	Additional Dip Tanks Required	Dip tanks that needed Rehabilitation	% Dip tanks that needed rehabilitation
Manicaland	544	22	487	89.52
Mashonaland Central	274	60	75	27.37
Mashonaland East	487	17	365	74.95
Mashonaland West	414	18	318	76.84
Masvingo	697	14	416	59.68
Matabeleland North	358	40	309	86.31
Matabeleland South	467	16	287	61.45
Midlands	487	20	380	78.03
Total	**3 726**	**207**	**2 637**	**70.77**

Source: Annual Reports (2015-2017)

During the period under review, I noted that the department had only managed to construct 31 dip-tanks. From interviews with veterinary officials in Umguza, Bubi and Tsholotsho Districts, it was revealed that there were inadequate dip tanks in their districts resulting in some farmers walking approximately 40km to and from a dip tank to have their cattle dipped. In other districts visited, furthest dip tanks were approximately 10km away from villages.

Of the 30 dip tanks that I inspected, I gathered that 27 of them were in a deplorable state and needed rehabilitation. These dip tanks did not have standard requirements like;

- Roofs – to prevent the dipping chemical from unwanted dilutions and evaporations,
- Races – to guide cattle where they are supposed to be,
- Head clamps – keep the cattle in position to allow for easy of vaccination and other treatments, etc. **Table 12** summarizes the number of dip tanks inspected in provinces visited and their state. **Refer to Annexure D for further details**.

Table 12: Summary of dip tanks inspected in provinces visited

Province	No. of Dip tanks visited	No. dip tanks without pens	No. dip tanks without races	No. dip tanks without roof	No. dip tanks without borehole
Mat North	12	7	8	8	5
Mat South	5	0	1	1	4
Mash West	7	7	7	7	7
Mash Central	4	3	3	2	1
Manicaland	2	0	1	0	2
Total	**30**	**17**	**20**	**18**	**19**

Pictures 2 and 3 shows some of the dip tanks in deplorable state that were inspected during the audit.

Picture 2: Glengurragh Dip Tank in Umguza District (Matabeleland North)

Source: Photograph by Audit Team (The dip tank had no roof, races, head clamp, side tanks and proper holding pens)

Picture 3: Magunje Dip Tank in Mashonaland West

Source: Photograph by Audit Team (The dip tank had no roof, races, head clamp, side tanks and holding pens)

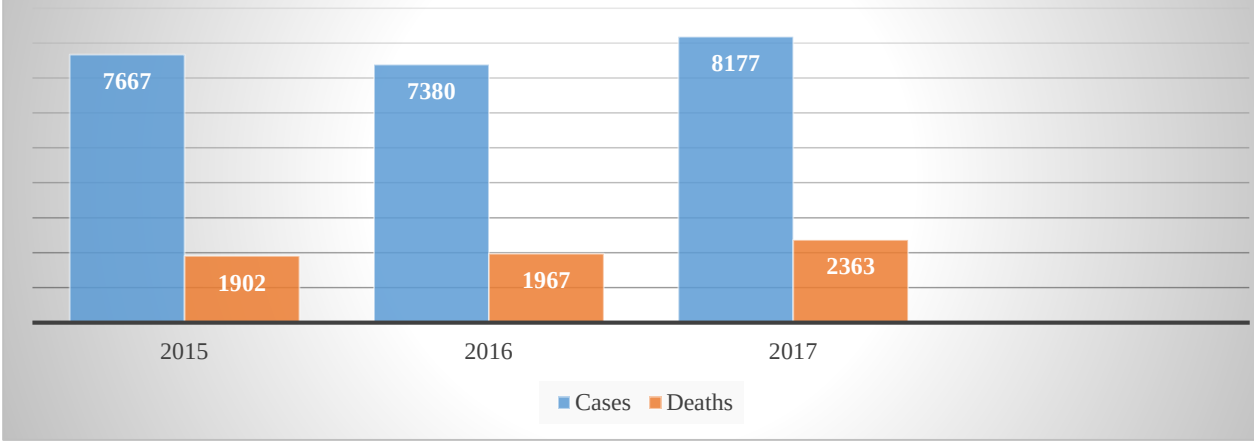
Annual reports for the years 2015 to 2017 also indicated that the Ministry had managed to rehabilitate some of the dip tanks with the assistance from Non-Governmental Organizations such as Amalima, Plan International and World Vision. **Picture 4** shows one of the dip-tanks that was rehabilitated in Tsholotsho in Matabeleland North province. The dip tank has a solar powered water supply system that ensures constant supply of water to the dip tank. The races, side tank and holding pens were in good condition.

Picture 4: Mahlatini Dip Tank in Tsholotsho District (Matabeleland North)

Source: Photograph by Audit Team (The dip tank had roof, races, head clamp, side tanks and holding pens)

Inadequate implementation of the dipping programme resulted in outbreaks of tick-borne diseases. **Graph 3** shows an analysis of cases and deaths because of tick-borne diseases. In 2015, 7 667 cases of tick-borne diseases were recorded, and 1902 cattle died. 1n 2016, number of cases declined by 3.74 % to 7 380 compared to 2015. However, the deaths recorded increased by 3.42% to 1 967. In 2018, the number of cases recorded increased by 10.80% and deaths recorded by 20.13% compared to year 2017. Analysis of tick-borne diseases reports (2015 -2017) indicated that an average of 27 % of tick-borne cases resulted in death of cattle in all the provinces (23 224 cases and 6 232 deaths were recorded). In the period, January to May 2018, 2 982 cases recorded resulted in 983 deaths (33%) throughout the country.

Graph 3. Cases of tick borne diseases and deaths reported in the country.



Source: Annual Reports 2015 to May 2018

From the interviews with department officials in all provinces visited my audit established that failure to conduct planned dipping sessions resulted in outbreaks of January Disease, Heart water, Red water and Gallsickness killing large numbers of cattle.

Interviews with officials manning Animal Health Management Centres (AHMCs) in all the provinces visited revealed that, in the past, they used to sell drugs to farmers for treatment of various animal diseases. The farmer found it helpful as he or she would get everything from the AHMC. However, the AHMCs are now providing only professional veterinary advice to farmers. The current system now prolongs the attention that should be given to animals as the farmer gets consultancy from the AHMC and incur additional transport costs when they want to procure drugs from private drug sellers, most of whom were found in cities or towns. This prompted farmers to shun the AHMCs and go straight to drug dealers who may not provide the correct drug.

Management response:

In response, management acknowledged the observation and stated that the department had made several representations to the Ministry of Finance for timely release of funding for dipping chemicals. The department further stated that they also supported forex applications to the Reserve Bank of Zimbabwe (RBZ) by the two suppliers of dip chemicals to import active ingredients for the local manufacture of the chemicals. Each of the two

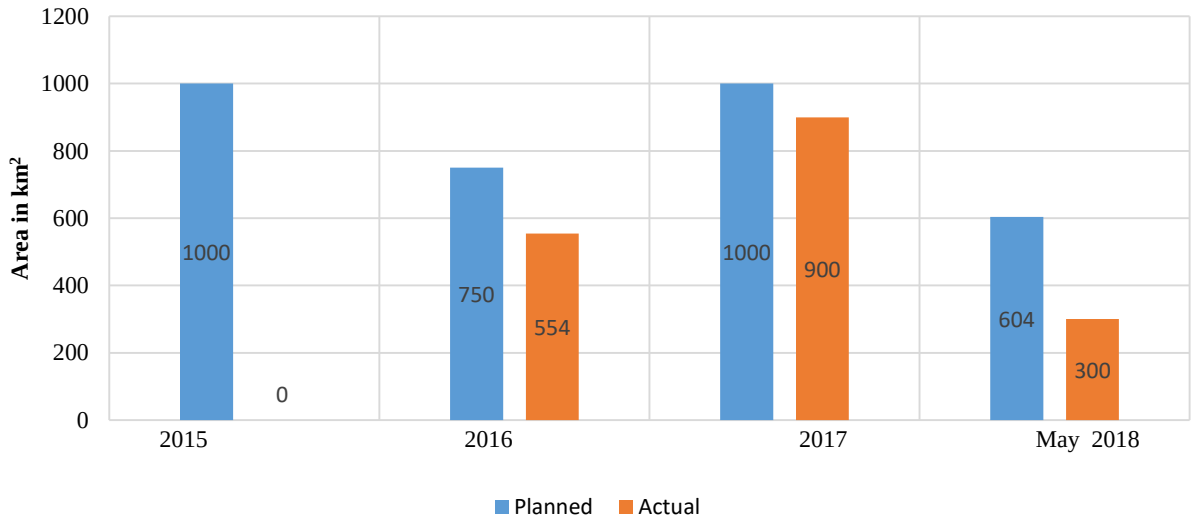
companies had been promised USD 50 000 per week by RBZ. The department hopes this offer will be sustained going forward.

3.2.4 Eradication of tsetse flies preventing trypasonomiasis.

According to Section 5(2)(b) of the Animal Health Act [*Chapter 19:01*] and Section (1) (1.1.2) of the Standard Operating Procedures and Handbook for Tsetse Field Staff, the mission of the department is to eradicate tsetse in order to promote human and animal health. According to the Tsetse Control RBMs for 2015-2018, they planned to eradicate 15 % of the tsetse infested area by 2018 to enhance agricultural potential in tsetse cleared areas. Tsetse infested areas cover approximately 30 000km^2 countrywide.

My review of the Tsetse Control Division's annual and RBM reports for the period 2015- May 2018, revealed that planned tsetse eradication programmes were partially implemented. In the period 2015 to May 2018, the division managed to eradicate tsetse flies in an area of approximately 1 754 km^2 out of the planned 3 354km^2. The department managed to treat the area with assistance from the World Health Organization through its Tropical Diseases Research which started in 2016 and ended in 2017. However, in 2015 the department did not manage to treat anything because of shortages of insecticides. **Refer to Graph 4**

Graph 4. Analysis of area treated to eradicate tsetse (2015 to May 2018)



Source: Results based Management and annual reports 2015to May 2018

The reports further indicated a continuous spread of tsetse fly in some parts of the country and outbreaks of trypasonomiasis disease. A survey done in the year 2000, in Matusadonha National Park, indicated that tsetse flies were only confined to an area of approximately 3500km^2, but a survey in 2014 indicated that they had spread to an area of approximately 7500 km^2. Reinvasion of areas by tsetse fly was also witnessed at Kanyati in 2016 and at Ume Catchment Area covering an area of about 500km^2. The reports indicated that reinvasion was caused by inadequate funding for implementation of tsetse eradication and control measures. Interviews with officials indicated

that if tsetse eradication and control measures are not adequately done, there is a risk that in the next 10 years the fly would spread to almost all parts of the country.

My audit at Rushinga Tsetse Control Station, on August 8, 2018, revealed that the department was not adequately servicing the tsetse control barrier which prevented flies from Mozambique. The barriers consisted of targets[12] for eradication and traps for surveillance. The targets were not being replaced and maintained thereby reducing their effectiveness. My further review of annual and monthly reports for Rushinga District for the period 2015 to May 2018 indicated that the department had since stopped maintaining the barrier in Mt Darwin, Ruya and parts of Centenary due to transport challenges and lack of equipment to use. In addition, my interviews with officials indicated that the country was at a risk of reinvasion in these areas due to weak control barriers.

During the period 2015 to May 2018, 149 cases of African Animal Trypasonomiasis and 7 cases of Human African Trypasonomiasis were recorded. However, interviews with Tsetse Control Division officials indicated that the figures for the cases recorded could be grossly understated as tsetse control surveys and surveillance programmes for the diseases were not adequately done due to mobility challenges and also that diagnostic techniques used (Wet and Dry Smear) had a major limitation in specificity and sensitivity. They highlighted the need to move to modern techniques like molecular diagnosis which was not yet in use due to funding challenges.

Tsetse Control Surveys and Surveillance Programme

The RBM reports for the period 2015 to 2018 indicated that the department planned to carry out tsetse control surveys for a distance approximately 24 720km^2. The reports indicated that of the planned 24 720km^2 the department managed to carry out tsetse control surveys in approximately 21 549km^2 representing an average of 87% of the planned target. My interviews with management revealed that this was achieved mainly through assistance from donor community.

From the review of annual reports (2015-2017) for Tsetse Control Division, I gathered that tsetse control and surveillance programme implementation was affected by shortage of resources which included funding, motor vehicles, fuel, equipment and travelling and subsistence allowances. This led to workers only surveying areas in walkable distances from their field station. **Map 1** shows areas affected by tsetse fly as at December 2017. According to inspections done by the department, reinvasion had already happened in areas surrounding the tsetse limit line which recorded positive cases of trypasonomiasis.

[12] Targets: insecticide-impregnated screens which function by attracting the flies to a device that collects and/or kills them.

Map 1: Areas affected by Tsetse Fly in the Country

Source: Tsetse Control Annual report 2017

Implementation of Tsetse Control Interventions and Control Techniques

According to Standard Operating Procedures for Tsetse Control and Handbook for Tsetse Field Staff, different methods of tsetse control are used with different degrees of success. These control strategies being used to eradicate tsetse are either stationary or mobile bait methods which include use of targets, cattle dipping, ox bait and traps for surveillance. Other strategies include ground spraying, sterile insect techniques and traffic control barriers.

Tsetse Control officials at the 4 field stations visited (Doma, Rekomichi, Rushinga and Makuti) revealed in an interview that targets were being used to eradicate tsetse, however, their efficiency had reduced from approximately 80% to about 40%. The officials indicated that efficiency of the targets depended much on hardware, availability of insecticide and frequency of monitoring. The targets that the division was using did not have standard hardware which would allow them to swing to attract more tsetse flies. Officials at Rekomichi Research Station stated that non availability of proper target hardware and insecticide had significantly reduced the efficiency of targets as instruments to eradicate tsetse. At Doma field station, 2000 targets were deployed in 2012 and since then no monitoring and spraying of insecticide was done. **Picture 5** shows an example of targets being used.

Picture 5: An example of target being used

Pictured by Auditors during visit

Traps were also being used at all the stations visited (Doma, Makuti, Rushinga and Rekomichi) to carry out surveys on existence of tsetse flies in the areas where eradication controls had been done or in new areas invasion was suspected. However, my interviews with officials at the stations visited indicated that shortage of insecticides and disturbances by wildlife compromised their efficiency. In addition, monitoring of traps in distant areas was affected by shortage of vehicles. **Picture 6** shows an example of traps being used.

Picture 6: An example of trap being used

Pictured by Auditors during visit

In my review of the Handbook for Tsetse Field Staff (*Section 1.1.3. Page 8*) and interviews with officials at head office and stations visited, I gathered that there were other methods like ground spraying and aerial spraying techniques which were no longer being done due to their impact to the environment. Aerial spraying was last done in 1988 and ground spraying in 2012. These methods were said to be also relatively expensive. On the other hand, the use of ox bait method was considered ineffective as the cattle numbers at the stations were very low to represent the population in the tsetse infested areas. For example, instead of having a herd of at least 20 cattle per station, Doma station had 5 whilst Makuti and Rekomichi had 7 each. Rushinga field station did not have a herd of cattle for the ox bait method and it relied only on targets which were no longer being serviced. A traffic control gate, in Makuti, was being used to monitor and stop dispersion of tsetse to non-invaded areas. However, limited supply of insecticide to spray motor vehicles coming from infested areas reduced its efficiency.

Inefficiencies in the implementation of tsetse control interventions and control techniques have a risk of increasing chances of reinvasion by tsetse flies in the country and risk of death of cattle and human beings because of trypasonomiasis.

Management response

In response, management stated that it was true that the division of Tsetse Control had been partially implementing tsetse eradication and control programs. They added that there was a risk of reinvasion in areas previously cleared of tsetse flies. Furthermore, management stated that there was a continuous spread of tsetse flies in some parts of the country and outbreaks of trypasonomiasis disease which was impacting negatively on cattle production.

Auditor's evaluation of management response

Whilst I acknowledge the management`s response, the department did not state what action they intend to take to stop widespread and reinvasion in areas that were previously cleared of tsetse flies.

3.3 Veterinary public health inspections and surveillance of cattle diseases

Section 5 (1) of the Animal Health Act *[Chapter 19:01]* stipulates that the department should prevent entry of diseases into Zimbabwe through inspections, certifications and manning of border posts. Veterinary Services are supposed to be found at all border posts and abattoirs in the country to prevent and guard against the introduction of disease.

The department's reports stated that inspections and surveillance of cattle diseases are being conducted at all 3 Zimbabwe international airports (Harare, Bulawayo and Victoria Falls) and at all 10 official border posts (Beitbridge, Chirundu, Nyamapanda, Kariba, Forbes, Victoria Falls, Kazungula, Pandamatenga, Espungabera and Plumtree) to improve trade through reduction of the risk of unwanted and illegal importation of animals and animal products, veterinary medicines and biologicals. However, from the ports of entry visited, (Beitbridge, Kariba and Chirundu) I observed that inspection services were weak because of limited coordination of borders and shortage of staff. For instance, at Beitbridge border post, due to inadequate staff, border manning hours were reduced from 24 hours to 16 hours and this meant that there was a time veterinary services were not available during the day giving most importers chances to smuggle live animals into the

country. In addition, veterinary public health officials and inspectors at provincial offices and border posts visited revealed that there was no rapid laboratory testing equipment at border posts for testing samples of imports and exports of cattle. Audit noted that this might pose a risk of allowing infected animals into the country unnoticed.

For airports, the department arranged with ZIMRA to notify them whenever they encounter cases of live animals or products that need veterinary services approval before being accepted. My audit could not visit airports to review reports and carryout inspections due to time limitations.

On the other hand, according to a department report of registered abattoirs as at June 30, 2018, there were 109 registered abattoirs[13] in the country. The legal requirements are that all registered abattoirs should be serviced by food inspectors, but the department was restricted by their staff strength as services were offered in only 67 abattoirs (Staff availability is further explained in paragraph 3.7.3.) Furthermore, reports indicated that there were 661 abattoirs in the country and my analysis established that approximately 594 abattoirs were not being screened or surveilled for animal diseases, hence increasing the chances of failing to control and prevent diseases in case of an outbreak.

In addition, the veterinary public health programme in the provinces visited did not have vehicles allocated to it to carry out the activities. Each province was supposed to have at least 10 vehicles. The department was also not providing transport for inspectors to do inspections in areas far from their work stations. As a result, abattoir owners ended up providing transport to the meat inspectors in all the provinces visited during the audit posing a risk of lack of objectivity as the officers would be compromised to make independent decisions.

Management response:

The department in response concurred with the observation and highlighted that the presence of the department at border posts and abattoirs had significantly improved following the unfreezing of all vacant posts for veterinarians in the department. The Veterinary Public Health Section recently recruited a total of 11 new Veterinarians.

3.4 Laboratory diseases diagnostics

Standard Operating Procedures for Laboratory Diagnostics and Animal Health Research and International Best Practise requires that laboratory confirmatory diagnosis/ screening of animal disease of major economic importance must be done. According to International best practices, it is a requirement that a nation can only declare absence or presence of a disease upon laboratory confirmation/screening of the disease.

Diseases diagnosis

From the review of Veterinary Laboratory Diagnostics and Animal Health Research sub-programme's annual reports for the period 2015- 2017, my audit established that the department performs veterinary laboratory diagnostic services at its Central Veterinary Laboratory in Harare and 3 Provincial veterinary laboratories (Bulawayo, Mutare and Masvingo). Review of the Manual for Sample Collection, Preservation and Tests Methods of 2015 also revealed that the testing

[13] Grade A, B and C Slaughter houses and slabs

equipment available in the 3 provincial laboratories was only basic and not up to the required standard for accreditation under ISO17025. The Central Veterinary Laboratory (CVL) was ISO17025 accredited under Virology, Bacteriology, Protozoology, Helminthology and Molecular Biology diagnostic sections. The CVL was also dealing with complicated tests which were being referred from provinces.

The veterinary laboratory in Bulawayo performs diagnostic tests for Brucellosis, Anthrax, Mastitis, Clostridium disease, Coccidiosis, Skin scraps and Tick-borne diseases. My interviews with officials at the provincial office for Matabeleland North revealed that for complicated tests (those that cannot be carried out at the provincial laboratory such as FMD, Newcastle and Rabies) were being referred to the CVL for confirmation, a process which was said to be taking relatively up to a month for samples to be delivered due to transport challenges.

From the interviews held with officials at Matabeleland South Provincial Veterinary office, I gathered that the province did not have a veterinary laboratory. Further, it was indicated that all samples collected were being referred to Matabeleland North provincial laboratory and to the central laboratory in Harare for diseases confirmation. In Mashonaland West and Mashonaland Central, samples were collected and sent to the CVL as the provinces did not have their own laboratories.

In addition, from my interviews with officials at Mutare Provincial Laboratory and review of documents provided during audit, I gathered that the laboratory was capable of testing 9 out of 35 animal diseases considered as notifiable. The laboratory was also incapacitated to test diseases which required culturing[14] or use of ELISA (a test that uses antibodies and color change to identify a substance). It was also highlighted that the laboratory had functional equipment for diagnosing FMD which was lying idle due to absence of reagents. Interviews with officials of the 3 districts visited (Chipinge, Chimanimani and Buhera) revealed that they were not being provided from head office with proper bio-safety material and leak-proof packaging for safe transfer of samples. The officials also revealed that district offices used to have microscopes for screening diseases such as Anthrax and Tick-borne diseases. Only one (Nyanga District) out of 7 in the province was said to have a microscope. Microscopes in all the other districts were no longer operational. The microscopes helped in expediting the diagnosis of diseases without referring much to the laboratories which had their own problems. The acquisition of a new microscope was said to be in the range of $6 000. Interviews revealed that those that had broken down needed minor repairs.

Audit also gathered that doctors, animal health inspectors and veterinary extension workers in all provinces and districts visited were not being supplied with veterinary kits for diseases diagnosis. Refer to **Annexure E** for list of requirements for veterinary kits.

According to the 2015-2018 reports, the main diseases confirmed through tests at CVL included FMD, New Castle, Lumpy skin, Anthrax, Black leg, Rabies, Brucellosis, Mastitis and Salmonellosis. In cases of tests beyond its capacity, reference testing and diseases' troubleshooting, the department was making use of internationally accredited reference laboratories such as Botswana Veterinary Institute to confirm diseases and to conduct specialized testing. Interviews revealed that these processes were taking relatively long due to delays in

[14] Culturing: Maintaining (tissue cells, bacteria, etc.) in conditions suitable for growth.

transportation of samples, shortage of foreign currency to set off accumulated debts and to pay for the services rendered.

Turnaround time for testing cattle diseases samples

A review of the Central Veterinary Laboratory Report dated 14 June 2018 revealed that laboratories testing turnaround times for notifiable diseases[15] are supposed to take between 1 day to 6 weeks. Refer to **Table 13** for testing turnaround times of sampled notifiable diseases.

Table 13: Laboratory standard testing turnaround times.

Disease	**Test method**	**Testing time (in working days/ hours)**
Avian influenza	Serological	5 days
	PCR	1 day
Anthrax	Microscopical exam	1 day
Brucellosis	Culture	6 weeks
	Serological	4 days
	Milk ring test	1 day
	PCR	1 day
FMD	Serological	7 days
	PCR	1 day
Mastitis	Culture	5 days
Newcastle disease	Serological	5 days
Rabies	IFAT	1 day
Salmonellosis	Culture	5 days
Theileriosis (and other tick borne diseases)	Microscopy	1 day
	PCR	1 day

Source: Laboratory Standard Operating Procedures

However, documentary review of samples' tests reports for the period 2015- June 2018 showed that the department had been failing to meet most of its diseases testing turnaround times for samples received mainly because of lack of testing chemicals (reagents, reverse transcriptase enzymes etc.) For instance, 4 samples received from provinces in 2015 of suspected Newcastle disease had not yet been tested as at the date of audit, June 14, 2018 (approximately 3 years 6 months after) and the samples have been preserved since then. 4 Samples of suspected Avian Influenza disease received in 2015 together with 210 received in 2016 were later tested in June 2017 (approximately 1 year 6 months after) because of lack of reagents. Further, 5 000 samples of suspected FMD received in 2016 could not be tested at CVL because of lack of reagents and were later sent to Botswana Veterinary Institute for confirmation. However, only 2 500 were tested and the other half still awaits procurement of reagents for them to be tested (Approximately 2 years 6 months). **Annexure F** shows a summary of samples which failed to meet their testing turnaround times, reasons thereof and their status.

From the information provided on request from the auditee on samples that failed to meet their testing turnaround times, I noted that there were also 1 490 more FMD samples which were

[15] A **notifiable disease** is any **disease** that is required by law to be reported to government authorities.

collected for the purposes of surveillance but had not yet been tested as at June 14, 2018, due to lack of reagents. Culture for blackleg has since been stopped due to lack of reagents. In addition, Salmonellosis and Listeriosis samples were not being cultured using recommended reagents. Antibiotic sensitivity testing has been suspended due to lack of a substance called Mueller Hinton Agar. Food microbiology tests were also being compromised due to use of alternative equipment as recommended equipment was non-functional.

According to annual reports and responses from veterinary officials, inadequate laboratory testing services were mainly caused by lack of reagents, obsolete laboratory equipment and materials resulting from inadequate funding. In addition, lack of an efficient transport system for diagnosticians and researchers to follow-up on disease investigations, client outreach activities and collection of samples needed for validation delayed testing of diseases.

Departmental reports highlighted that if the country has poor disease diagnostic services or if such services are not provided timeously, resources would be lost due to wrong diagnosis and wrong drugs may be administered. Failure to diagnose diseases in time may lead to delayed response to animal diseases hence delayed treatment and continuous spread. This would impact seriously on cattle population in the country. International trade in animals and animal products will also be affected once the laboratory diagnosis of animal diseases was not being done to meet international standards of accuracy.

Management response:

The department agreed to the observation and stated that funding requests for the necessary upgrades had been submitted in the 2019 budget proposal to Ministry of Finance. Unfortunately, funds could not be availed in the 2019 budget. The department will continue to request for funding in the coming budgets.

3.5 Research and vaccine production

According to Standard Operating Procedures for Laboratory Diagnostics and Animal Health Research, research services are supposed to be done for animal diseases of high economic importance together with developmental projects like vaccine production programme and specialist extension services cattle. There are five internationally accredited diagnostic sections namely bacteriology, virology, protozoology, helminthology and molecular biology.

Animal Health Research

From my review of Veterinary Laboratory Diagnostics and Animal Health Research sub programme's annual reports for the period 2015-2017, I established that the department was not effectively and adequately carrying out animal health research for the purposes of improving prevention and control mechanisms for various animal diseases. In addition, the reports stated that most research projects that were done during the period were being funded by donors as animal health research activities were not being prioritized by government as far as funding was concerned. Of the 19 research projects planned during the period 2015 to 2017, 8 were completed and they were all funded by donors. 11 projects were still to be commenced as the department

was still waiting for funds from government. Refer to **Annexure G** for planned and completed projects and projects not yet completed.

More so, the reports stated that very little investigatory and applied research was carried out during the period due to unavailability of transport for both technical and professional staff to carry out their official duties. The reports indicated that unsatisfactory research performance by the department was also caused by non-availability of experienced researchers. The department had 9 out of 23 Veterinary Research Officers in post as at May 2018.

In addition, veterinary laboratory diagnostics and animal health officials at head office, revealed that failure by government to fund animal health research activities has resulted in animal health research being compromised. The department, in the Veterinary Laboratory Diagnostics and Animal Health Research sub programme's annual report of 2015, on page 4 (Section 2b, Research Programmes), wrote that failure by government to fund animal health research has resulted in research priorities being biased towards priorities of Donors and Development Partners who are funding a few animal health research projects at the expense of national research priorities.Very little investigatory and applied research was contributing immensely to increased number of cattle diseases outbreaks, cattle deaths and compromising on diseases prevention and control strategies as the department had limited opportunities to understand the causes of diseases, effectiveness of existing methods of prevention and control of diseases and develop new vaccines and improve existing prevention and control measures.

Management response:

In response, management concurred with the observation and stated that it has been very difficult to fund research projects from the fiscus due to the limited budget allocation. The department however would continue to look for research partners as has been happening in the past.

Vaccine Production

From a review of Standard Operating Procedures (SOP/PRVP/001) and interviews with Veterinary Laboratory Diagnostics and Animal Health Research officials at head office, I noted that the Central Veterinary Laboratories through its section of protozoology currently produces 2 vaccines for Red water and Gallsickness disease. The objective of the department was to produce vaccines for all tick-borne diseases namely Red water, Gallsickness, Heart water and January diseases. The department currently was said to be working on to resume production of January diseases vaccine which was previously shelved due to resource constraints following increased number of cattle deaths in the country from 2015 to May 2018. I noted from interviews with the department's officials that vaccine production was still a developmental programme and that vaccines were produced on request and sold.

According to the 2016, Veterinary Laboratory Diagnostics and Animal Health Research report, tick borne diseases vaccines could not be produced in 2016 due to the delayed procurement of reagents and antigens[16] for use in the testing and production process by the FAO under the

[16] Antigen: a toxin or other foreign substance which includes an immune response in the body, especially the production of antibodies.

Nkayi/Lupane project. **Table 14** shows an analysis of cases and deaths of cattle reported for tick borne disease for the period 2015- May 2018. The number of deaths per cases reported averaged 21% for Gallsickness, Red water 16%, Heart water 36% and January disease 47% respectively. The analysis shows that January Disease and Heart water killed more cattle per cases reported than Gallsickness and Redwater for which vaccines are produced.

Table 14. Analysis of Tick-borne diseases cases and death of cattle

Disease	Year	2015	2016	2017	2018(Jan-May)	Ave Deaths %
Gall sickness	Cases	3166	2617	3060	999	
	Deaths	628	578	666	214	
	Death ratio	**20%**	**22%**	**22%**	**21%**	**21%**
Red water	Cases	1488	1126	1588	431	
	Deaths	266	129	289	79	
	Death ratio	**18%**	**11%**	**18%**	**18%**	**16%**
Heart water	Cases	2766	2873	3085	826	
	Deaths	895	1077	1129	297	
	Death ratio	**32%**	**37%**	**37%**	**36%**	**36%**
January Disease	Cases	247	764	444	726	
	Deaths	113	183	279	393	
	Death ratio	**46%**	**24%**	**63%**	**54%**	**47%**

Source: Diseases trends 2015to May 2018

According to a research project done by the department in Nkayi and Lupane Districts in Matabeleland North Province from 2015 to 2016, tick borne diseases were said to be responsible for major cattle losses in the areas. Tick-borne related deaths accounted for 65% of the reported cases. My audit also, gathered through interviews, that there were no vaccines being produced by the department for diseases of major economic and zoonotic importance such as FMD and Anthrax as there were no financial and human resource expertise to produce the vaccines. The interviews held with officials in Matabeleland North Province revealed that there were no research staff and that the provincial laboratory did not have capacity to produce vaccines. The government relied on imported vaccines from other countries together with donor support from organisations like FAO-EU. The government has been failing to provide adequate supply of vaccines to cushion outbreak of diseases because of foreign currency challenges.

3.6 Availability of financial resources

The Ministry established a fund called the Agricultural Revolving Fund (ARF) in terms of Section 18 of the Public Finance Management Act [*Chapter 22:19*]. One of the objective of the fund is to provide resources to the Department of Veterinary Services for maintenance and replacement of essential equipment and purchase of consumables required in the delivery of services on dipping, quarantine services, test and examination for import/export, immunization, diseases eradication, marking and branding services, inspection and issuance of permits, farm inspection for disease surveillance, clinical and post-mortem examination, meat hygiene inspection, meat reside testing, wildlife unit, tick borne disease vaccination production and dipping chemical resistance research.

From the review of financial statements for the period 2015 to 2017, I established that total revenue amounting to $24 114 342 was generated into the fund. However, no resources were channelled towards fulfilling objectives of the veterinary department. Veterinary officials stated that the department does not retain any revenue generated and funds are managed at ministry level. **Table 15** highlights breakdown of the revenue.

Table 15. Agricultural Revolving Fund income collected (2015-2017)

Description	**2015**	**2016**	**2017**	**TOTAL**
Sales	1 585 080	2 150 752	1 982 102	5 717 934
Permits	1 763 891	1 617 184	1 458 195	4 839 270
Fees	5 258 804	4 317 650	3 912 057	13 488 511
Gains from fair value – biological assets	68 627			
Total Income	**8 676 402**	**8 085 586**	**7 352 355**	**24 114 342**

Source: Financial statements for 2015-2017

From review of financial statements, my audit noted that some of the funds generated into the fund were being used to finance other activities of the Ministry other than the purposes for which the fund had been created. Activities that are ordinarily met from appropriation account were now being funded from the ARF account thus disadvantaging the objectives of the fund. For instance, analysis of unaudited financial statements for the year 2016 for the Ministry showed that fees amounting to $1 350 954 were appropriated from Veterinary Services operations to fund Economics and Markets Imports and Exports Account. Furthermore, the unaudited ARF financial statements for the year ended 2017 showed that fees amounting to $2 007 738 generated from Animal Management and Health Centre which were supposed to be used among other things to improve Veterinary Services operations was transferred to Ministry's head office to cater for the Ministry administrative expenses. Audit noted that this was crippling the operations of the Veterinary Services Department.

Management response

The department stated that representation has since been submitted to the Finance Director for the Ministry raising this concern. The director responded passively and gave a directive to stop the depositing of all ARF funds from departments into the Ministry's central ARF account. All provinces are now depositing ARF revenue into the Department of Veterinary Services account. The department will only have to submit monthly revenue returns to the Ministry which would play an oversight role to ensure funds are used for the intended purpose in line with ARF constitution.

3.7 Provision of Protective Clothing, Camping Equipment and Vehicles and skills availability.

According to Standard Operating Procedures, cattle and veterinary workers are supposed to be issued with protective clothing twice a year (work suits, gumboots, overalls, safety shoes, socks etc.) and camping equipment. Camping equipment comprise of tent, galvanised iron bucket, a

stretcher bed, mosquito net, water bag and a canvas bath and the items are to be replaced as and when they worn out. Other equipment needed include rifles, shovels, hoes etc. Each work station is supposed to have at least one vehicle. According to the Department of Veterinary Services recruitment policy, key personnel required are supposed to be recruited in accordance with the approved staff establishment by Public Service Commission. To enhance successful implementation of department's programmes, there is need for adequate appropriately qualified and skilled personnel.

3.7.1 Protective Clothing and Camping Equipment

Review of department's distribution of protective clothing reports in all provinces for the period 2015- May 2018 indicated that veterinary services workers were not provided with adequate protective clothing. The analysis of statistics indicated that there was a distribution gap of 30% for work suits during the period 2015- May 2018 across all provinces. On the other hand, the distribution gap of rain coats, gumboots, dust coats, safety shoes and sun hats were above 57% on average. Full protective clothing was supposed to be given twice a year, however, due to erratic supplies, the reports indicated that no worker had been provided a full set since 2015. Refer to **Table 16** for analysis of distribution of protective clothing.

Table 16. Distribution of protective clothing to all provinces in the country (2015- May 2018)

Details	2015	2016	2017	May-18	Total	Minimum number of staff in post at national level	Protective clothing distribution gap	Protective Clothing Distribution gap %
Work suits	1 070	605	615	365	2 655	3 772	1 117	30%
Rain Coats	410	0	316	0	726	3 772	3 046	81%
Gumboots	1 046	300	75	186	1 607	3 772	2 165	57%
Dust Coats	1 125	154	0	0	1 279	3 772	2 493	66%
Safety Shoes	600	0	95	0	695	3 772	3 077	86%
Sunhats	0	0	370	0	370	3 772	3 402	90%

In Mashonaland West province, some workers were last issued with protective clothing in 2012 and in Matabeleland North and South, they were last issued in 2015. Mashonaland Central province last received at the beginning of 2018. This had put workers at a higher risk of being injured or contaminated with diseases at work. Dip attendants and Veterinary Extension Workers in these provinces used their money to buy their own protective clothing. However, in Manicaland province, my audit noted that they were not only relying on protective clothing bought centrally at head office but were also procuring at their level as they had made protective clothing a key priority. I did not manage to get a document from head office authorising Manicaland provincial office to purchase protective clothing for its staff.

Most workers in the provinces visited were not vaccinated with anti-rabies and officials were citing that the vaccine was expensive and supplies from head office were erratic. Workers were not being provided with materials such as bio safe and leaf proof packaging for safe handling and transfer of samples for diseases such as FMD, anthrax and rabies.

None of the provinces visited had adequate camping equipment which included tents for use as shelter during field work. At all the tsetse field stations visited, workers were working in areas with dangerous wild animals like lions, snakes and elephants without rifles and protective clothing to protect themselves in the event of an attack. At Rekomichi Research Station in Mashonaland West province, the available borehole was located 3km away into the game park with elephants and other wild animals and workers had no choice but to risk their lives in order to ferry water without defensive equipment to protect themselves against any attacks from wildlife.

Departmental reports also indicated that inadequate protective clothing and equipment affected the operations of the department as in most times workers would be reluctant to expose themselves to dangerous working environments.

Furthermore, in all provinces visited, they had no storage facilities such as deep freezers, fridges and cold rooms for storing cattle drugs. All Animal Health Management Centre offices in areas visited were not electrified and veterinary officers resorted to either use of ice blocks, personal fridges or borrowing facilities from friends and shops in the area.

Management response:

While agreeing to the observation, the department stated that this was primarily due to resource constraints affecting the department. Resources available do not allow the provision of a full set of protective clothing for everyone as required. This forces the department to procure limited quantities of essential protective clothing as and when resources become available.

3.7.2 Availability of Vehicles and access to equipment

Analysis of the Veterinary Services Vehicle Register as at May 2018 indicated that vehicle strength for the entire department was on average at 28%. Refer to **Table 17.**

Table 17. Analysis of vehicles for the Veterinary Service Department (May 2018)

Vehicle type	Requirement	Available	Variance	Strength
4*4 Double Cab	12	1	11	8%
4*4 Single Cab	13	4	9	30%
4*2 Single Cab	310	98	212	32%
4*2 Double Cab	41	32	9	78%
3 to 10 tonne Lorries	10	4	6	40%
Motor Cycles	1 320	341	979	26%
Bicycles	1 292	372	920	29%
Tractor	8	3	5	39%
Total	**3 006**	**855**	**2 151**	**28%**

Further analysis established that all the 8 Provinces had less than 15 vehicles each instead of at least 30 as per department's requirements. My documentary review established that on average, 55% of vehicles in provinces were non-runners due to inadequate servicing. Of the 45% running vehicles, majority of them were distributed for use at provincial offices at the expense of districts.

A review of the Tsetse Control vehicle register showed that 15 out of 21 or (71%) of vehicles available at head office were non-runners. Further review of the vehicle register showed that there were no vehicles at all tsetse field stations in the country. I noted during interviews with officials at Doma Tsetse Field Station in Mashonaland West Province, that due to lack of vehicles, workers spent more time walking to access facilities. For example, they travel approximately 15km to fetch water as their bowser tanker broke down and was never repaired since 2010. The unit relied on hiring vehicles (which was costing approximately $15 000 to hire a lorry for a period of 3 weeks) from Central Mechanical and Equipment Department (CMED Pvt Ltd)**.**

In all the provinces visited, a total of 62 motor bikes were non-runners and needed major services and repairs. It was stated that most motor bikes in the department had never been serviced since they were bought. **Picture 7** shows some of the unrepaired motor bikes deteriorating at the Mashonaland Central Provincial Office.

Picture 7: Part of the Motor bikes awaiting repairs in Mashonaland Province

Pictured by Auditors: Mashonaland Central Provincial Office

My review of the annual and monthly reports for the period 2015 to May 2018 indicated that shortage of vehicles crippled the department's quest to prevent and control cattle diseases. For example, staff under the Veterinary Public Health Programme did not have vehicles for them to do inspections in areas far from their work stations.

Most of the veterinary duties demanded veterinary officers to go into the farms and villages to carry out animal health inspections, farmer education and administering vaccination programmes. 72% of veterinary officers at AHMCs and dip attendants did not have either bicycle or motor bike to use to travel during field work. Some dip tanks and villages were far away from the AMHCs. For instance, in Tsholotsho District, in Matabeleland North Province, the furthest dip tanks and villages were 60km away from AHMCs and the district staff were not visiting those areas to carry out animal health inspections since 2015. This had resulted in most centres providing mostly services in areas within the walkable distances. For distant areas, the AHMCs were relying on Local Community Development Committees and AGRITEX officers who were not experts in veterinary services such as animal health inspections and diseases' surveillance.

Management response:

The department acknowledged the observation and indicated that the available fleet was so small that it becomes impossible to provide all working stations with a vehicle. The department has resorted to managing the available fleet from provincial offices where vehicles are allocated to districts in rotation for them to implement their programs and respond to emergencies.

3.7.3 Skills availability and qualifications of staff

The division of Veterinary Services and Tsetse Control under the Department of Veterinary Services had an approved staff establishment of 4 767 throughout the 8 provinces in the country. My analysis of the Department's Staff Establishment and Strength Document dated 31 May 2018, established that the department had 3 772 filled posts which translated to an average strength of 79%. Refer to **Table 18** which shows staff establishment, filled posts and vacancies per province. Analysis shows that employees were fairly deployed in the provinces with 829 vacancies throughout the country.

Table 18. DVS Staff Establishment and Strength per province as at May 31, 2018

Province	Establishment	In Post	Vacancies	Strength (In post/establishment)
Mashonaland West	416	342	74	82%
Mashonaland East	424	354	70	83%
Mashonaland Central	381	282	99	74%
Matabeleland North	620	423	197	68%
Matabeleland South	479	367	122	77%
Midlands	484	392	92	81%
Manicaland	539	470	69	87%
Masvingo	570	464	106	81%
Grand Totals	**3 913**	**3 084**	**829**	**79%**

Source: Staff establishment as at 31 May 2018

However, further analysis revealed that key positions which included District Veterinary Officers (DVOs), Government Veterinary officers (GVOs) and Animal Health Inspectors (AHI) (now Veterinary Extension Supervisors) particularly in most of the districts were not filled. For instance, 44 out of 61 districts in the 8 provinces did not have District Veterinary Officers, 39 districts out of 61 had no Government Veterinary Officers and 139 out of 224 animal health inspector positions were not filled in all the 61 districts. DVOs, GVOs and AHIs are the experts in animal disease detection and treatment and their shortage posed a risk to the department of failing to prevent and control diseases. In my interviews with veterinary management at head office and in provinces visited, I gathered that technical duties such as animal health inspection and disease surveillance were in some instances being done by unqualified personnel which included dip attendants and general hands.

From further analysis of staff establishment and strength document, I gathered that in all 8 provinces there were no Veterinary Epidemiologists (key personnel responsible for animal diseases surveillance, investigation, evaluation, management of diseases' trends, planning and implementation of epidemiological programmes in the prevention and control of cattle diseases) due to freezing of posts by government.

Veterinary officials in Matabeleland North, Matabeleland South, Manicaland and Mashonaland Central provinces also lamented transfer of new Veterinary Extension Workers (VEW) into the Department of Veterinary Services from other departments such as AGRITEX, Irrigation and Mechanization who had knowledge in crop production and other fields instead of knowledge in animal health. These people were now expected to obtain relevant skills from Mazowe Veterinary College at their own expense which require approximately $400 per semester as the department had no plans in place to fund their training programme. From the interviews held, these people were arguing that their transfers were not out of their own making hence they expected the Department to fund the training programmes.

Veterinary Laboratory Diagnostics and Animal Health Research Programme was also handicapped in terms of skills availability and staffing levels. 2015-2018 reports revealed that Chief Veterinary Research Officer posts continued to be difficult to fill due to the freezing of posts as well as failure by the Department to get qualified and experienced researchers who met job description requirements. Department officials revealed that this was because of unattractive salaries and incentives that were being offered for these posts. The reports further revealed that Veterinary Doctors who are employed by the Department would mostly leave in their first or second year in search for greener pastures in the neighboring SADC countries with better conditions of service. **Table 19** shows the current establishment for technical staff for Laboratory Diagnostics and Animal Health Research.

Table 19. **Establishment of technical staff for diagnostics and research program (May 2018)**

Professional Category	Approved Establishment	Number of Officers in Post	Vacant posts	Staffing Levels as a % of the Establishment
Veterinary Research Officer	23	9	14	39%
Technologist	36	23	13	64%
Technician	21	12	9	57%

Source: Staff establishment as at 31 May 2018

Tsetse Control was also affected due to freezing of posts by government. Of the 9 Field Stations, (Lusulu, Gokwe, Makuti, Mushumbi, Doma, Kotwa, Rushinga and Save-Runde) only 2 had Chief Tsetse Field Officers. This implied that Tsetse flies research, trypasonomiasis surveillance and diagnostics were compromised. Interviews with Officials at Head Office also revealed that two posts under the mapping office were phased out. This paralyzed preparation and distribution of cartographic maps used by field staff to implement tsetse control field operations.

The Veterinary Public Health Program was also understaffed and was struggling to discharge its duties which included regulatory inspections and surveillance of animal and animal products. Key positions which included Veterinary Public Health Officers, Chief Food Inspectors and Food Inspectors were the most affected. For instance, of the 8 Provinces, only Masvingo and Matabeleland North Provinces had Veterinary Public Health Officers. None of the provinces had Chief Food Inspectors as per establishment. Food inspectors in post were 44 out of the 67 required. Interviews with officials at Head Office revealed that most of these posts were affected by government freezing of posts. Disease surveillance, prevention, screening and control in abattoirs and at country border posts as a result were compromised. For example, at Beitbridge port of entry, due to inadequate staff, border manning hours were reduced from 24 hours to 16 hours.

Management response:

The department has since successfully lobbied for the unfreezing of all vacant posts for veterinarians. A total of 65 veterinarians have since been recruited and deployed to various work stations throughout the country.

AUDITOR'S OVERALL EVALUATION OF MANAGEMENT RESPONSES

Whilst I appreciate the scarcity of resources, the responsibility of the department is to prevent the establishment and reduce the spread of diseases with the available resources. I noted that the Agricultural Revolving Fund (ARF) generated a significant amount of revenue as highlighted on paragraph 3.6 which in my opinion, if the amount had been invested into the department's operations some of their activities would have yielded better results. Furthermore, I noted that the department had limited its revenue base by discontinuing the selling of drugs to farmers at Animal Health Management Centres.

There are also other activities which the department can reinforce such as awareness campaigns and farmer education which may assist to reduce with little resources availed, cattle losses due to various diseases.

CHAPTER 4

4. CONCLUSION

4.1 The audit concludes that the Department of Veterinary Services is not adequately prepared to prevent and control spread of cattle diseases as its research projects, diseases prevention and control programmes were being partially implemented. The department is becoming more reliant on the donor community for the supply of vaccines, research activities as well as construction and rehabilitation of dip tanks. This resulted in the division being unable to adequately prevent the occurrence and spread of diseases particularly FMD, anthrax and tick-borne diseases and develop new and improve existing diseases prevention and control measures. Instead of adopting a proactive approach, the division adopted reactive approach in dealing with cattle diseases. In most cases, the department was responding to diseases after their outbreak. This was adversely affecting beef trade, draught power, food adequacy and nutrition as lives of Zimbabweans depend largely on cattle.

4.2 The department is not managing to conduct regular vaccination programmes in FMD red zones. Vaccination programmes and cattle movement controls between red and free zones which are being implemented by the department are not effective to eradicate FMD. In addition, failure to prevent occurrence and spread of FMD is causing international markets, such as the European Union not to lift ban on meat exports from Zimbabwe. Irregular vaccination of cattle in anthrax zones is resulting in the division failing to contain anthrax. Most of the anthrax cases being reported are not being attended to timeously as there are no drugs in Animal Health Management Centres. As a result, most of the cattle that get affected by anthrax end up dying.

4.3 The department is unable to adequately implement the dipping program. Shortage of dipping chemical is inevitably affecting implementation of the programme and approximately 65% of reported tick-borne disease cases result in death every year. More so, at least 70% of the dip tanks in the country are dilapidated and need repairs in order to function properly.

4.4 Facilities at 3 available provincial laboratories need to be upgraded to meet international standards. On the other hand, the absence of laboratories in 5 provinces is contributing immensely to delays in the testing of samples from these provinces. Delays in testing samples or diagnosing suspected diseases is impacting seriously on spread of cattle diseases.

4.5 Animal health research in the department seem not to be prioritised in the Ministry. Absence of research activities leaves limited opportunities for understanding the causes of diseases, effectiveness of existing methods of prevention and control of diseases, development of new vaccines and improvement of existing preventive and control measures. Most research projects that are being done by the department are funded by donors who may not always sponsor projects that are a priority to Zimbabwe. Government of Zimbabwe is not investing much in animal health research and this is making it difficult for the department to come up with robust prevention and control of diseases to curtail outbreaks.

4.6 The Department is not providing effective veterinary services at border posts in the country triggering a high risk of entrance of animal diseases into Zimbabwe. On the other hand, the

department is not adequately monitoring operations at abattoirs. Approximately 60% of the registered abattoirs are not being screened or surveilled for animal diseases thus increasing the chances of ill-health on consumers of meat products.

4.7 The Division of Tsetse Control is partially implementing tsetse eradication and control programmes. There is a risk of reinvasion in areas previously cleared of tsetse flies. Furthermore, there is a continuous spread of tsetse flies in some parts of the country and outbreaks of trypasonomiasis disease which is impacting negatively on cattle production.

4.8 The Department is not effectively utilising the ARF funds on activities such as maintenance and replacement of vehicles, animal health research and procurement of vaccines but rather financing the Ministry and other sister departments' administrative expenses. There is no consistence on utilisation of ARF funds.

The Department of Veterinary Services is not adequately providing protective clothing to its staff in most provinces. Field workers were at a high risk of contracting diseases and losing lives as most of them were executing their duties without protective clothing.

On the other hand, Veterinary Services vehicle strength for the entire department is very low. This is greatly affecting execution of duties. Inequitable distribution of vehicles is crippling the Department's quest to prevent and control cattle disease as the services of the department demands mobility for veterinary officers to go into the farms and villages to carry out animal health inspections, farmer education and administering vaccination programmes. Most vehicles were stationed at head office and provincial offices.

4.9 Some of the Department's key positions that require specialist services are vacant. The department is at risk of not being able to control and prevent diseases as some expertise needed is not available. At the moment these duties are being done by unqualified personnel.

CHAPTER 5

5.0 RECOMMENDATIONS

My recommendations below are intended to facilitate efficient provision of cattle diseases prevention and control measures.

5.1 The Department of Veterinary Services must formulate and implement a comprehensive management system for cattle diseases that would ensure emergencies are responded to in an effective and timely manner.

- A proactive approach in preventing and controlling foot and mouth disease should be adopted by the Department of Veterinary Services. This would involve regular vaccination programmes of red zones. During outbreaks, it is recommended that the department conducts coordinated vaccination programmes to all neighbouring districts rather than concentrating on the affected areas only. The department should also develop strategies that would curb movement of cattle from red zones to free zones. Movement of cattle from one region to another should be strictly monitored to ensure that all cattle being moved have movement permits in accordance with the regulations.

- Regular vaccination of cattle in anthrax hot-spots should be done timeously by the department to reduce the outbreak of anthrax. Cattle in areas surrounding hot-spots should also be vaccinated to help reduce spread of anthrax in the event of an outbreak. Further, the department should also prioritise provision of drugs or vaccines to Animal Health Management Centres so that farmers can access them easily.

5.2 The department should prioritize procurement and stocking of enough reserves for dipping chemical to avoid interruption of dipping sessions.

- Comprehensive plans for rehabilitation of dip tanks should be effectively implemented by the department to complement efforts being made by the donor community in dip tank rehabilitation throughout the country. The department may consider engaging farmers to provide labour with the division providing other materials which according to the department were estimated at $5 000 to rehabilitate a dip tank. There is need also to enhance the dipping program to A1 farmers in resettlement areas by constructing dip tanks.

- Assistance should be given by the department in coordination with other government departments like District Development Fund (DDF) to farmers in regions with low rainfall, for example, Region 5 by drilling boreholes. The department should train its staff on how to correctly measure and effectively apply pour-on.

5.3 Procurement of equipment and insecticides to eradicate tsetse should be prioritized to ensure adequate implementation of tsetse eradication programmes. Tsetse surveillance programmes should also be adequately done. Proper control measures must be instituted to avoid reinvasion of previously cleared areas.

5.4 Stringent border control systems should be effectively implemented to avoid entry of infected cattle into the country. The border inspection should be strengthened by considering employee skills mix at the ports of entry. Furthermore, to enhance management of border inspection, close cooperation should be established with ZIMRA and the ZRP. The department should set up inspection hours or programme for animals at small official border posts in the country to strengthen monitoring controls and avoid cattle smuggling activities into the country. The department should adequately monitor operations at all abattoirs.

5.5 Laboratory facilities at provincial offices should be upgraded to ensure that major disease tests are done. The department should review its financial resource priorities and consider financing establishment of laboratories in other provinces. Further, an emergency buffer stock of reagents or testing chemicals should be maintained to avoid stock-outs. The department should also ensure that all districts have emergency testing kits.

5.6 Investment in research and development should be considered by the department to avoid donor dependency. They should also consider increasing production of various vaccines to ensure that drugs and vaccines are always available for disease prevention and control as it seemed cheaper to produce than importing. The department should come up with research priorities targeting mainly on how to prevent and control diseases of economic importance so that the country will regain the international market lost due to diseases.

5.7 Prioritisation of operations must be done by the department and diversion of financial resources to other activities should be avoided. The department should also consider selling drugs at Animal Health Management centres to increase revenue generation and reduce the distance travelled by farmers to city centres in search for drugs.

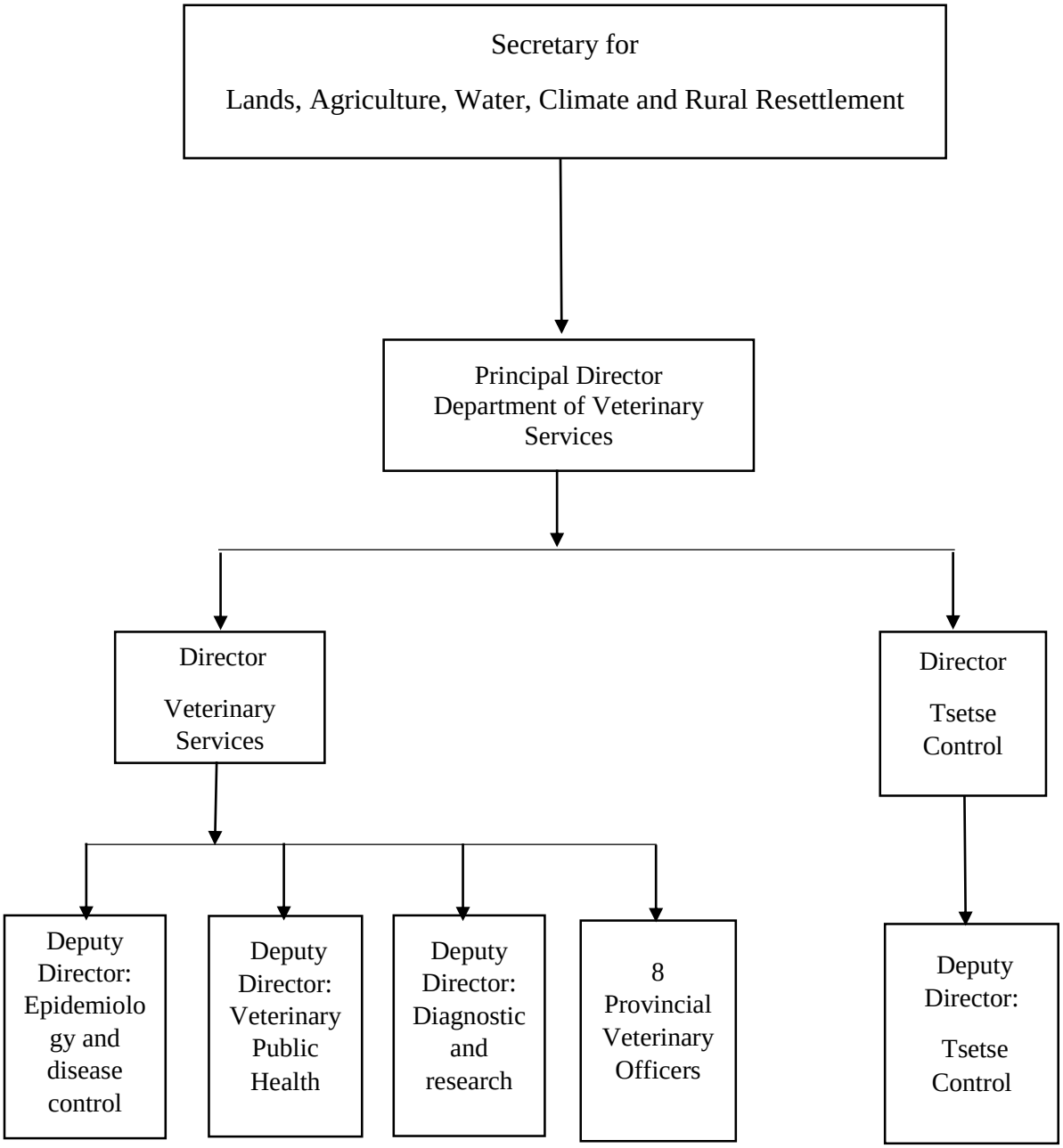
- Workers should be provided with suitable clothing to protect them against accidents and contracting of diseases at work.

- The Department of Veterinary Services should make sure that available vehicles and motor bicycles are serviced in time. In addition, the department should review its vehicle distribution policy to ensure that vehicles are fairly distributed to provinces and districts to improve operations. This involves deployment of vehicles to critical areas in the department such as districts and animal health management centres.

- A programme of continuing education should be developed to improve the technical and operational skills of all staff of the department. Staff transferred from other departments should be trained and or mentored on animal health to add value in the discharge of duties.

- The department should also convince Public Service Commission that the posts they need filled are critical.

ANNEXURE A. SUMMARIZED STRUCTURE OF THE DEPARTMENT OF VETERINARY SERVICES.



ANNEXURE B: LIST OF INTERNAL AND EXTERNAL INTERVIEWEES

Details of Organization or Department	**Designation**
Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement.	Director Finance- Acting/Accounting Officer
Department of Cattle and Veterinary Services	Acting Principal Director
1. Division of Veterinary Services	
a. Diagnostics and Animal health Research.	Director
b. Epidemiology and Disease Control	Deputy Director
c. Veterinary Public Health	Deputy Director
2. Tsetse Control	Deputy director
3. Cattle production and development	Director
Human Resources	HR Officer
Mashonaland West Provincial Office	Provincial Veterinary Officer
	Veterinary Public Health Officer
	Senior Food Inspector
	3 Meat graders
Makonde District	District Veterinary Officer
Matoranjera Animal Health Management Centre	Veterinary Extension Worker and Dip Attendant
Portlet Animal Health Management Centre	Veterinary Extension Worker
11 Miles Abattoir	Meat Grader and Food Inspector
Doma Tsetse Field Station	Assistant Senior Tsetse Field Officer and 3 Officers
Zvimba District	District Veterinary Officer
Vhuku Abattoir	Food Inspector
Chegutu District	District Veterinary Officer
	2 Animal Health Inspectors
Marahwa Animal Heal Management Centre	Veterinary Extension Worker and 2 Dip Attendants
Dombwe Animal Health Management Centre	Veterinary Extension Worker and 2 Dip Attendants
Karoi-Kariba Districts	District Veterinary Officer
Magunje& Katonhera Animal Health Management Centres	Veterinary Extension Worker

Makuti Tsetse Field Station	Principal Tsetse Officer, Field Officer and HR Officer
Rekomichi Tsetse Research Station	Principal Tsetse Research Officer and 2 Assistants
Chirundu Border Post	3 Assistant Food Inspectors
Kariba Border Post	Food Inspector and 2 Assistants
Agritex – Mashonaland West	Cattle Officer
Matabeleland North Provincial Office	Provincial Veterinary Officer
	Human Resources Office
	Administration Officer
	Accounts Officer
Nyamandlovu District	Animal Health Inspector and HR Officer
Glencurragh Animal Health Management Centre	Veterinary Extension Worker and Dip Attendant
Tsholotsho District	Animal Health Inspector
Mbamba Animal Health Management Centre	Veterinary Extension Worker and Dip Attendant
Tsholotsho Animal Health Management Centre	Veterinary Extension Worker
Bubi District	Animal Health Inspector
Kenilworths Animal Health Management Centre	Veterinary Extension Worker, Dip Attendant and Farmers
Mashila Animal Health Management Centre	Veterinary Extension Worker and Dip Attendant
Matabeleland South Provincial Office	Acting Provincial Veterinary Officer
	Chief Animal Health Inspector
	Human Resources Officer
	Accounts Officer
Mangwe District	Animal Health Inspector and HR Officer
Madabe Animal Health Management Centre	General Hand
Matobo District	Acting District Veterinary Officer and Animal Health Inspector
Maphisa Animal Health Management Centre	Veterinary Extension Worker
Beitbridge District	Acting District Veterinary Officer

Lutumba Animal Health Management Centre	Veterinary Extension Worker, Dip Attendant and General Hand
Shabwe Animal Health Management Centre	Veterinary Extension Worker and General Hand
Beitbridge Border Post	Food Inspector
Manicaland Province Office	Acting Provincial Veterinary Officer
	Chief Animal Health Inspector
	Human Resources Officer
	Accounts Officer
Chipinge District	Government Veterinary Officer, Animal Health Inspector and HR Officer
Chibuwe Animal Health Management Centre	Veterinary Extension Worker and Dip Attentant
Buhera District	2 Animal Health Inspectors and HR Officer
Munyanyi Animal Health Management Centre	Veterinary Extension Worker and Dip attendant
Chimanimani District	Animal Health Inspector, Accountant and HR officer
Chimanimani Animal Health Management Centre	Veterinary Extension Worker and LDC chairman
Mashonaland Central Province	Provincial Veterinary Officer
	Chief Animal Health Inspector
	Human Resources Officer
	Accounts Officer
	Acting Veterinary Epidemiologist
Shamva District Office	Animal Health Inspector, Admin Officer and HR Officer
Kajakata Animal Health Management Centre	Veterinary Extension Worker and Dip Attendant
Chakonda Animal Health Management Centre	2 Veterinary Extension Workers and General Hand and Dip Attendant
Mazowe District Office	Animal Health Inspector and HR Officer
Verona Animal Health Management Centre	Veterinary Extension Worker
Nyota Animal Health Management Centre	Veterinary Extension Worker
Rushinga District	Veterinary Extension Worker, HR Officer and Accountant and Tsetse Field Officer
Chomutukutu Animal Health Management Centre	Veterinary Extension Worker
Mt Darwin/Rushinga FMD Road Block	3 Veterinary Officer

ANNEXURE C. AREAS VISITED IN PROVINCES

Name of Province/District	**Area Visited**
Harare	Koala Park Abattoir
Mashonaland West Province	Provincial Office Chinhoyi
Districts	Makonde Office
	Zvimba Office
	Chegutu Office
	Karoi-Kariba Office
Makonde District	Matoranjera Animal Health Management Centre
	Portlet Animal Health Management Centre
Chegutu District	Marahwa Animal Health Management Centre
	Dombwe Animal Health Management Centre
Karoi-Kariba Districts	Magunje Animal Health Management Centre
	Katonhera Animal Health Management Centre
Dip tanks	
Makonde District	Mutorabadza Dip tank
	Chitomborwizwi Dip tank Portlate Dip tank
Chegutu District	Marahwa Dip tank
	Dombwe Dip tank
Karoi-Kariba Districts	Magunje Dip tank
	Mahororo Dip tank
Tsetse Field Stations	
Makonde District	Doma Field Station
Karoi-Kariba Districts	Makuti Field Station
	Rekomichi Research Station
Abattoirs	CSC Chinhoyi
	11 Miles abattoir-Makonde

	Vhuku abattoir-Zvimba
	Lake Harvest-Kariba
Border Posts	Chirundu Border Post
	Kariba Border Post
Matabeleland North Province	Provincial Office Bulawayo
Districts	Nyamandlovu Office
	Tsholotsho Office
	Bubi Office
Animal Health Management Centres	
Nyamandlovu District	Glencurragh Animal Heath Centre
Tsholotsho District	Mbamba Animal Health Management Centre
	Tsholotsho Animal Health Management Centre
Bubi District	Kenilworths Animal Health Management Centre
	Mashila Animal Health Management Centre
Dip tanks	
Nyamandlovu District	Glencurragh Dip tank
	East Junction Dip tank
Tsholotsho District	Tsholotsho Dip tank
	Malanda Dip tank
	Mamba Dip tank
	Mahlatini Dip tank
Bubi District	Sibomvu Dip tank
	Bubi Crescent Dip tank
Matabeleland South Province	Provincial Office Gwanda
Districts	Mangwe
	Matobo
	Beitbridge
Animal Health Management Centres	
Mangwe District	Madabe Animal Health Management Centre

Matobo District	Maphisa Animal Health Management Centre
Beitbridge District	Lutumba Animal Health Management Centre
	Shabwe Animal Health Management Centre
Dip tanks	
Mangwe District	Ngwanyana Dip tank
	Madabe Dip tank
Matobo District	Sinti Dip tank
Beitbridge District	Lutumba Dip tank
	Bubi Crescent Dip tank
Border posts	Beitbridge Border Post
Manicaland Province	Provincial Office Mutare
Districts	Chipinge
	Buhera
	Chimanimani
Animal Health Management Centres	
Chipinge District	Chibuwe Animal Heath Centre
	Save Conservancy Boundary
Buhera District	Munyanyi Animal Health Management Centre
Chimanimani District	Chimanimani Animal Health Management Centre
Dip tanks	
Buhera District	Hande Dip tank
Chimanimani District	Charleswood Dip tank
Mashonaland Central Province	Provincial Office Bindura
Districts	Shamva
	Mazowe
	Rushinga
Animal Health Management Centres	
Shamva District	Kajakata Animal Heath Centre

	Chakonda Animal Health Management Centre
Mazowe District	Verona Animal Health Management Centre
	Nyota Animal Health Management Centre
Rushinga District	Chomutukutu Animal Health Management Centre
Dip tanks	
Shamva District	Kajakata Dip tank
	Chichera Dip tank
Mazowe District	Kanyemba Dip tank
	Verona Dip tank
Police Road Blocks	Mt Darwin/Rushinga turn off FMD control
	Road Block

ANNEXURE D: STATUS OF DIP TANKS INSPECTED

Province	District	Dip Tank	Pens	Races	Roof	Borehole	Comment/Condition
Mat North	Umguza	Glengurragh	N	N	N	N	Need Rehabilitation
		Bantu	Y	N	N	N	Need Rehabilitation
		East Junction	N	N	N	N	Need Rehabilitation
		Quarantine	N	N	N	Y	Need Rehabilitation
	Tsholotsho	Tsholotsho	Y	Y	N	Y	Need Rehabilitation
		Malanda	Y	Y	Y	Y	Satisfactory
		Mahlatini	Y	Y	Y	Y	Satisfactory
		Amalima	Y	Y	Y	Y	Satisfactory
	Bubi	Glenmore	N	N	N	N	Need Rehabilitation
		Sibomvu	N	N	N	Y	Need Rehabilitation
		Bubi Crescent	N	N	N	N	Need Rehabilitation
		Lortondale	N	N	Y	Y	Need Rehabilitation
Mat South	Mangwe	Ngwanyana	Y	Y	Y	Y	Satisfactory
		Madabe	Y	N	N	N	Need Rehabilitation
	Matobo	Sinti	Y	Y	Y	N	Need borehole
	Beitbridge	Lutumba	Y	Y	Y	N	Need borehole
		Mapolovele	Y	Y	Y	N	Need borehole
Mash West	Makonde	Matorabadza	N	N	N	N	Need Rehabilitation
		Portlet	N	N	N	N	Need Rehabilitation
		Chitomborwizi	N	N	N	N	Need Rehabilitation
	Chegutu	Marahwa	N	N	N	N	Need Rehabilitation
		Dombwe	N	N	N	N	Need Rehabilitation
	Kariba	Magunje	N	N	N	N	Need Rehabilitation
		Mahororo	N	N	N	N	Need Rehabilitation
Mash Central	Shamva	Kajakata	N	N	N	Y	Need Rehabilitation
		Chichera	N	N	Y	Y	Need Rehabilitation
	Mazowe						
		Kanyemba	N	N	N	Y	Need Rehabilitation
	Rushinga	Chomutukutu	Y	Y	Y	N	Need Rehabilitation
Manicaland	Buhera	Hande	Y	Y	Y	N	Need Rehabilitation
	Chimanimani	Charleshood	Y	N	Y	N	Need Rehabilitation

Key

N= No **Y= Yes available**

ANNEXURE E: VETERINARY KIT EQUIPMENT-DISEASE CONTROL KIT

1. Post mortem box
2. Flying knife
3. Cutting knife
4. Sharpener
5. Automatic syringe and needles
6. Usable plastic syringes
7. 15 gauge needles
8. 21 gauge needles
9. Tattoo forceps, digits and ink
10. Post mortem gloves
11. Thermometer
12. Casting rope
13. Mouth gag
14. Hacksaw
15. Hacksaw blade
16. Post mortem scissors
17. Microscopic slides
18. Surgical blades
19. Chopper/PM axe
20. Calving ropes
21. Dosing gun
22. Burdizo and Burdizo spanner
23. Universal bottles

ANNEXURE F. SAMPLES FOR NOTIFIABLE DISEASES NOT MEETING TESTING TURNAROUND TIME 2015-2018

Year	Disease	Section	Samples not tested on time	Reason for not testing	Status of samples/ Comments
2015	Newcastle disease	Molecular biology	4	No reverse transcriptase enzyme	Samples preserved Approximately 3 years 6 months
	Avian influenza	Molecular biology	4	No reverse transcriptase enzyme	Samples preserved Approximately 3 years 6 months
2016	Avian influenza	Serology	210	Lack of reagents	All samples were eventually tested in June 2017. Approximately 1 year 6 months
	PPR	Serology	512	Lack of reagents	Samples were tested in February 2017 when test kits were procured Approximately 1 year 1 month
	FMD	Serology	5000	Lack of reagents	Samples were sent to Botswana Vaccine institute when personnel from the CVL went there for training. However, only 2500 could be tested; therefore 2500 still await testing to date following our procurement of the required reagents. Approximately 2 years 6 months
2017	FMD	Serology	651 (at CVL) 2500 (at BVI)	Lack of reagents	Backlog still being cleared Approximately 1 year 5 months
	PPR	Serology	621	Lack of reagents	Samples still to be tested when test kits are availed Approximately 1 year 5 months
	Brucellosis	Serology	1490	Lack of reagents	Reagents availed could not clear backlog Approximately 1 year 5 months
	Newcastle disease	Molecular biology	7	No reverse transcriptase	Samples preserved Approximately 1 year 5 months

				Gel electrophoresis power pack down	
	FMD	Molecular biology	1	No reverse transcriptase Gel electrophoresis power pack down	Samples preserved Approximately 1 year 5 months
	Avian influenza	Molecular biology	1	Gel electrophoresis power pack down	Samples preserved Approximately 1 year 5 months
2018	FMD	Serology	621 (at CVL) 2500 (at BVI)	Lack of reagents	The backlog of samples at the CVL is in the process of being cleared. Of priority in testing are recent suspected outbreak samples and pre- movement samples. Approximately 5 months
	PPR	Serology	25	Lack of reagents	Samples accumulating since 2016 because of lack of test kits. Total of 646 samples preserved awaiting testing. Approximately 5 months
	Avian influenza	Serology	360	Limited reagents	Reagents are available but preserved for current surveillance in high risk areas Approximately 5 months
	CBPP	Serology	148	Lack of reagents	No kits for testing Approximately 5 months
	Newcastle disease	Molecular biology	8	No reagents	Samples preserved Approximately 5 months
	FMD	Molecular biology	1	No reagents	Samples preserved Limited reagents availed but backlog could not be cleared Approximately 5 months
	Brucellosis Bovine tuberculosis Anthrax	Bacteriology	-	Lack of critical reagents	Testing is being compromised due to lack of critical reagents Approximately 5 months

ANNEXURE G. RESEARCH PROJECTS STATUS

Title	Source of funding	Implementation period	Comments
Establishing a regional network of food safety laboratories through the application of nuclear and related technologies (RAF/5067)	International atomic energy agency (IAEA)/ AFRA	2011-2016	Project outputs achieved
Geomatic technologies transferred to animal health services in Southern Africa (GEOSAF)	European union/ CIRAD	2014-2017	Project outputs achieved
Improving Cattle Productivity through Strengthened Transboundary Animal Disease Control using Nuclear Technologies to Promote Food Security (AFRA) (RAF/5068)	IAEA	2014-2017	Human capacity building in terms of training and capacity building in terms of reagents for establishing laboratory tests e.g. ASF-PCR Project Completed.
Capacity building for trade related laboratories in Zimbabwe	EU/ITC	-2017	Project completed
OIE Brucellosis twinning project	World Organisation for animal health (OIE)	2014-2016	Project completed. Critical to carry out brucellosis surveillance in order to achieve reference status. Shortage of reagents major challenge. Project Completed
Capacity Building Of MAMID And Farmers For The Control Of Animal Diseases To Attain Commercialization Of An Integrated Smallholder Cattle - Sector In Nkayi And Lupane Districts (ZIM/TCP/3502)	Food and agriculture Organisation (FAO)	2015-2016	Project outputs achieved. National capacities for TBDs diagnosis, Acaricide resistance testing and TBDs vaccine production enhanced. Project Completed
The Epidemiology of Epizootic Ulcerative Syndrome in finfish on Dams and Rivers on the Kavango-Zambezi (KAZA) and the Great Limpopo (GL) Trans frontier Conservation Area in Zimbabwe: Implications on Human Livelihoods and the Aquatic Environment.	EU/ CIRAD-Dream Project	2016- 2019	Project implementation on going-Not completed
Roadmap towards OIE accreditation as the SADC	Enhanced Research for	2017-2018	Project implementation on going- Not Completed

reference Centre for Brucellosis diagnosis and surveillance	Africa Network (ERFAN)		
Production of January disease vaccine	Government of Zimbabwe	2018-2019	Implementation recently commenced- Not Completed
ZIM5024; Establishing an Artificial insemination semen production centre	IAEA/ Government of Zimbabwe	2018-2021	Implementation recently commenced- Not Completed
Upgrading diagnostic capacity and determination of the distribution of Trichinellosis in selected porcine herds in Zimbabwe	Government of Zimbabwe	2017-2018	Project implementation commenced- Not Completed Pepsin reagents for trichinellosis testing unavailable
Distribution of honey bee parasites in Zimbabwe	Development partners and Government of Zimbabwe	2018-2019	Still to be implemented
Exploring changes in the distribution of suitable habitat for *Amblyomma hebraeum* in Zimbabwe: An insight into the influence of climate change on tick species distribution**.**	Development partners and Government of Zimbabwe	2018-2019	Still to be implemented
A study of antihelminthic resistance in selected sheep and goat farms in Mashonaland east	Development partners and Government of Zimbabwe	2018-2019	Still to be implemented
Surveillance for Highly Pathogenic Avian Influenza (HPAI) focusing on (H5N8) and related influenza viruses in Zimbabwe	Government of Zimbabwe	2017-2018	Still to be implemented
PPR surveillance in goats and sheep in Districts bordering Zambia and Malawi	Government of Zimbabwe	2017-2018	Still to be implemented
Antimicrobial resistance and residue surveillance in animals and animal products	Government of Zimbabwe	2017-2018	Still to be implemented
Bovine Malignant Catarrh Fever surveillance in Mwenezi and Matopos Districts	Government of Zimbabwe	2017-2018	Still to be implemented
Theileriosis national survey and genetic characterization of the *Theileria parva* parasites	Government of Zimbabwe	2017-2018	Still to be implemented