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*Standard Methods and Procedures (SMPs)
for Control of
Contagious Bovine Pleuropneumonia (CBPP)
in the Greater Horn of Africa*



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for Control of
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Foreword

The arid and semi-arid lands of the Horn of Africa (HOA) are home to poor and vulnerable populations, the majority of whom rely on livestock to sustain livelihoods. However, the performance of livestock in the region remains low, given the widespread occurrence of transboundary animal diseases (TADs) that are responsible for production losses, and reduced performance of intra- and inter-regional trade in livestock and livestock products. Because of disease outbreaks, live animal exports have been severely constrained during the past two decades, by bans imposed by importing countries to reduce risks associated with these diseases.

To address the negative impact of TADs on livestock trade, AU-IBAR and ICPALD together with the participating countries in the region, with financial support from the United States Agency for International Development (USAID), have developed a framework to support harmonization and coordination of the control of the diseases, referred to as the Standard Methods and Procedures (SMP) Approach. The SMP approach involves strengthening capacities of member states for surveillance, epidemiology, laboratory diagnostics, disease control programmes, and communications. The fundamental aspect of the approach is the linking of disease prevention and control activities in a country, to a set of regional minimum standards and procedures for TADs prevention and control in line with the World Organization for Animal Health (OIE) standards.

The minimum standards, procedures, methods and goals for a particular disease are contained in an individual SMPs. It deals with subject areas of surveillance, laboratory procedures and disease control, and states minimum standards, procedures and goals that must be met for harmonized regional control of a disease.

This booklet presents the SMPs for Contagious Bovine Pleuropneumonia (CBPP), and deals with the specific dynamics of CBPP prevention and control in the Greater Horn of Africa (GHOA).

The compilation of the materials in the SMPs for CBPP, taking into consideration the characteristics of the Greater Horn of Africa, was made possible by technical experts from the region with technical support from AU-IBAR, FAO, OIE and AU-PANVAC. AU-IBAR is indebted to many scientists who reviewed the document and especially to Dr. James Wabacha the coordinator of the SMP-AH project for coordinating the preparation of the SMPs.

The SMPs for CBPP targets field veterinary personnel, policy makers, laboratory personnel and veterinary students in the region.

Professor Ahmed El-Sawalhy

Director

African Union Inter-African Bureau for Animal Resources (AU-IBAR)

1.0. Introduction

1.1. Standard Methods and Procedures (SMP)

The Standard Methods and Procedures (SMP) approach is designed to guide and harmonize the work of Departments of Veterinary Services (DVSs) in the Greater Horn of Africa (GHOA) region in their approach to the control of trade-related Transboundary Animal Diseases (TADs).

Standard Methods and Procedures are operational protocols to create uniformity in animal disease detection, diagnostic and control procedures throughout the Greater Horn of Africa (GHOA). An individual SMP is a protocol for control of a given disease that outlines the measures that must be undertaken. The SMP deals with subject areas of surveillance, epidemiology, laboratory procedures, and disease control and states minimum standards, procedures, and goals that must be met for a harmonized regional control of a disease. It is supported with details as specified in Standard Operating Procedures (SOPS) for each subject area that are designed to fit the structure and capabilities of a given nation.

An SMP is a functional, action-oriented document and is not intended to provide a detailed description of the disease. It is also a live and flexible document and can be changed as new science and new techniques for control are discovered.

This SMP deals with the specific dynamics of Contagious Bovine Pleuropneumonia (CBPP) and specifies standard, methods, and procedures for surveillance, diagnosis and control of the disease.

1.2. Contagious Bovine Pleuropneumonia (CBPP)

CBPP is a contagious disease of cattle caused by *Mycoplasma mycoides* subsp. *mycoides* SC (MmmSC; SC = small colonies). It is a highly infectious, acute, sub-acute or chronic disease of susceptible animals including bovine and water buffalo affecting the lungs and occasionally the joints in young calves. The incubation period can be up to six months.

The disease currently occurs in most of sub-Saharan Africa and is endemic in the GHOA. The disease is a major constraint to cattle production through cattle mortality and reduced production. It has serious implications for food security and on people's livelihoods in affected countries.

In natural conditions, MmmSC affects only the ruminants of the *Bos* genus, i.e. mainly exotic and indigenous African cattle called zebu cattle. MmmSC (bovine biotype) has

been isolated from buffaloes in Italy (*Bubalus bubalus*) and from sheep and goats in Africa and more recently in Portugal and India, but the role of these species in the epidemiology of the disease is still unclear.

The role of wild animals in the epidemiology of the disease has not been widely documented. In the African context, there is no known wildlife reservoir.

CBPP is manifested by anorexia, fever and respiratory signs, such as dyspnoea, polypnoea, cough and nasal discharges. In the case of acute outbreaks under experimental conditions, the mortality rate may be as high as 50% in the absence of antibiotic treatment. When an outbreak first occurs in an area, the mortality will be high but is often lower in the field following the primary outbreak. The lesions of the disease are mostly confined to the thoracic cavity and are usually unilateral. On post mortem examination in acutely infected animals, lungs show consolidation (hepatisation) with caseous fibrinous deposits and marbled appearance on cut surface. The thoracic cavity may contain abundant clear yellowish brown fluid (pleural fluid) containing some pieces of fibrin. In chronic cases, lungs may show typical encapsulated lesions called 'sequestra'. Animals showing such sequestra may be responsible for unnoticed persistence of the infection in a herd or a region and play an important role in the epidemiology of the disease.

For purposes of implementation of this SMP, the following will be considered: Area with no known disease occurrence; disease free area, CBPP endemic area and CBPP epizootic phase.

Contingency planning for control of CBPP is based on effective control of any outbreak of CBPP. It is important to develop capacity for surveillance especially Participatory Disease Search (PDS), risk analysis, information management and laboratory diagnosis in order to respond appropriately to any outbreak.

2.0. Definitions

For common understanding of terminology, the following definitions will be used.

2.1. Surveillance and Epidemiology

Surveillance

The systematic ongoing collection, collation, and analysis of information related to animal health and the timely dissemination of information so that action can be taken.

Passive surveillance

This is a method of surveillance that enables veterinary authorities to collect animal health data and information from disease reporting stakeholders.

Active surveillance

This is a method of surveillance in which epidemiological information is collected through purposeful and planned interventions.

Syndromic Surveillance

This is a surveillance approach based on visual observation of the main signs of disease.

Clinical surveillance

This is a surveillance approach to investigate the occurrence of diseases based on observations of clinical signs.

Targeted surveillance

A form of active surveillance based on probability of occurrence of disease in a given area.

Risk-Based surveillance

A form of active surveillance that focuses on a certain area or livestock population based on perceived level of threat, risk and/or consequences.

Participatory Disease Surveillance

This is a form of active surveillance that uses participatory approaches in search of disease, including input from local livestock producers and others in the livestock value chain.

Epidemiological Unit

This is a group of animals with a defined relationship sharing common likelihood of exposure to a disease.

Risk mapping

A tool used for identification, assessment, communication and mitigation of a disease in a certain geographical area.

Zero Reporting

Periodic standard reports noting that surveillance in any form for a given disease has been carried out and no disease occurrence has been encountered. Zero reports are a valuable tool to indicate negative results of constant and ongoing passive and/or active surveillance.

2.2. Disease Status Areas

Area with no known disease occurrence It is an area where the disease has never been reported

Disease free area

Defined geographical area with no clinical signs of CBPP disease seen occurring or reported for the past three years without vaccination

Endemic area

An area where CBPP is constantly present in susceptible animal population

Epizootic phase

It is a period when CBPP disease is reported and confirmed in a susceptible animal population or region in excess of normal threshold.

2.3. Planning Documents

Standard Operating Procedure (SOP)

A plan of action for a particular undertaking that stipulates exact details of what must be done to accomplish the task.

Preparedness Plans

Preparedness planning involves capacity building, equipment procurement, personnel responsibility allocation, and training in all the disciplines that support effective disease control, e.g. epidemiology, laboratory, disease management, etc.

Rapid Response Plan

This is a pre-programmed plan for immediate response to a report of an outbreak of a TAD or other emergency disease with the goal of eliminating the index case and preventing disease spread. The Rapid Response Plan includes three components: the Epidemiology Section for disease investigation; the Laboratory Section for confirmation sampling; and the Disease Control Section for immediate disease control interventions if or as need be.

Contingency Plan

An operational plan designed for immediate control of a disease outbreak, typically composed by the Department of Veterinary Services for use within that country.

2.4. Personnel

Veterinary Officer

Government employed veterinarians and field staff

Veterinary Personnel

All people associated with veterinary work including public veterinary staff (government at any administrative level) and private veterinarians and their staff members.

3.0. Surveillance and Epidemiology

3.1. Case definition for CBPP:

A severe disease in cattle, characterized by fever, labored breathing and coughing, grunting when breathing. Head and neck extended when standing with front legs apart, lameness in calves up to six months due to painful limb joints.

At post mortem the pathological findings include unilateral lung hepatisation with caseous fibrinous deposits and marbled appearance,, abundant pleural fluid, enlarged mediastinal lymph node, pulmonary sequestrations and lung adhesions.

A tentative diagnosis of CBPP can be proffered based on clinical signs but laboratory confirmation is required for differential diagnosis with other diseases in the pneumonic complex with similar signs such as pasteurella pneumonia.

3.2. Predisposing Factors

The occurrence of CBPP is underpinned by risk factors related to environment, mixing of cattle with different immunological experience, management and production system and immune status of the host population. Livestock mobility and presence of naïve populations in an infected area are major predisposing factors.

CBPP is mostly reported in naïve populations and is severe in younger animals. The presence of chronically infected animals (lungers) in close proximity with naive animals is also an important predisposing factor, through aerosol transmission. Aerosol transmission enables rapid spread of the mycoplasma in large groups of animals. Animal movement (due to internal insecurity, cattle thefts, informal trade, watering, marketing and grazing), accompanied by porous borders and poor cross-border quarantine systems are also key predisposing factors for CBPP spread.

Other factors are poor nutrition and concurrent parasitic and bacterial infections which aggravates clinical disease.

3.3. Surveillance of CBPP according to disease status

3.3.1. Surveillance in areas with no known disease occurrence

The aim here is to establish the epidemiological status of the population in the area. Continuous passive surveillance and active surveillance should be carried out as need be, and appropriate reactions to suspicious cases implemented.

3.3.2. Surveillance in disease-free areas

Surveillance aims at detecting as early as possible CBPP emergence or re-emergence and also demonstrating the absence of the disease or infection. The surveillance to include: passive surveillance and active surveillance. Active surveillance should include syndromic surveillance, sero-surveillance and abattoir surveillance. For active surveillance, the approach here is targeted or risk-based, on perceived risk factors like neighboring an infected area with or without disease.

3.3.3. Surveillance in endemic areas

The aim of surveillance is to determine the level of occurrence and distribution of the disease in the area. Provide data for use in risk analysis and for targeted interventions. The activities to be carried out include passive surveillance and active surveillance (sero surveillance, syndromic surveillance and abattoir surveillance) in both endemic and epidemic situations. Functional demarcation between endemic and epidemic situations is important because the interventions in the two epidemiological areas are different.

3.4. Administrative Preparations

- a. Veterinary personnel working at all administrative levels must be trained on disease reporting using appropriate reporting systems, e.g. ARIS 2 and other national systems.
- b. The veterinary services itself should be equipped, at appropriate administrative levels, with necessary sample collection equipment, disease reporting tools and materials including standardized reporting formats, mobile phones, digital pens, etc.
- c. Undertake necessary capacity building to train and equip staff personnel at all levels.
- d. Policy or legal frame work supportive of surveillance.

3.4.1. Passive surveillance and passive surveillance field actions

- a. Veterinary personnel undertaking routine animal health activities e.g. markets stock route inspection, vaccination campaigns, extension services, abattoir activities, etc. are expected to carry out syndromic surveillance during which they will inspect livestock for signs of clinical disease and collect data from livestock keepers;
- b. The national veterinary authorities will engage and sensitize livestock value chain actors, including producers, traders and transporters, and abattoir workers to report any disease events encountered to the nearest animal health facility either public or private. This will include educational and informative materials on disease recognition and reporting and use of methods such as mobile phones, digital pens, pen and paper, radio programs, television programs, posters, information leaflets, community meetings, etc).

- c. In case of reports of suspected CBPP from the community, the responsible veterinary personnel, in collaboration with relevant ministry, will conduct outbreak investigation with sample collection and submission to the laboratory. The field staff should involve the Central Epidemiology Unit to delineate the outbreak;
- d. The responsible veterinary personnel will immediately report to the CVO and make a record in the standard reporting format;
- e. If a disease outbreak is confirmed, veterinary authorities shall institute appropriate control measures.

3.4.2. Active surveillance

The purpose is to demonstrate the presence or absence of CBPP antibodies and clinical disease in both endemic and area without the disease.

Surveillance may involve one or more of the following activities: syndromic surveillance (clinical surveillance); participatory epidemiology; abattoir surveillance and outbreak investigation of suspicious cases.

3.4.2.1 Sero-surveillance field actions

- a. Ensure that all necessary technical and logistical equipment is in hand;
- b. Use a pre-design survey protocol outlining sample size determination, sampling method, target population, sampling units and sampling frame taking into consideration livestock and wildlife;
- c. Use pre-designed data collection tools, including, questionnaires for epidemiological interviews, forms, and data collection software;
- d. Mobilize survey teams composed of properly trained personnel;
- e. Develop a survey program together with the survey teams;
- f. Share the program with relevant stakeholders in targeted areas;
- g. Collect blood samples from cattle using appropriate tools and techniques such as Vacutainers, filter paper, micro-bleeders, syringes, etc.;
- h. Ensure proper environment and time for serum separation, and proper storage of sera;
- i. Ensure accurate labelling of samples, maintenance of test and identification records, the samples cold chain, and proper laboratory submission procedures;
- j. Data will be entered in the Central Epidemiology Unit database for analysis and reporting;
- k. If laboratory testing detects a positive sample, the responsible veterinary personnel should conduct an investigation;
- l. If a disease outbreak is confirmed, veterinary authorities should institute appropriate control measures;

- m. Sero-surveillance for CBPP can also be approached by the analysis of cryo-preserved sera for CBPP antibodies from previous active surveillance for other diseases in the target populations.

3.4.2.2 Syndromic (Clinical) Surveillance

- a. Veterinary personnel undertaking routine animal health activities e.g. market stock route inspection, vaccination campaigns, extension services, abattoir activities, etc. are expected to carry out syndromic surveillance during which they will inspect livestock for signs of clinical disease and collect data from livestock keepers;
- b. Any disease syndrome characterized by sudden nasal discharges in mature animals onset of pneumonia, high morbidity, high mortalities in young animals, will be investigated in order to confirm or rule out CBPP;
- c. If symptoms are encountered, the responsible veterinary personnel should immediately report to the CVO and an investigation carried out. A report will be made in the standard reporting format;
- d. If the symptoms are not encountered the reporting officer should file a zero report, indicating that CBPP was not found in the flock;
- e. Share reports generated thereof promptly with the relevant stakeholders.

3.4.2.3 Participatory Disease Surveillance (PDS)

The purpose of PDS is to identify early cases. PDS is a good tool to establish the disease history for “the pneumonia syndrome” or the disease in an area. PDS is based on communication and transfer of indigenous knowledge for animal diseases, using a variety of procedures. To implement PDS follow the actions below:

- a. Training (capacity building) of veterinary personnel on the technique of PDS;
- b. Relevant veterinary authorities identify targeted risk areas and communities concerned;
- c. Prepare relevant checklists;
- d. Draw up a PDS program and share it with the target communities;
- e. Identify key contact people and if possible translators to be used;
- f. Implement informal interviewing;
- g. Undertake ranking/ scoring, seasonal calendar, time lines, mapping and any other relevant tools in a participatory manner with the local communities;
- h. Undertake visualization of data to achieve a common understanding with the communities;
- i. Undertake data cross-checking by probing, triangulation and laboratory diagnosis for confirmation;
- j. Complement information so far collected with secondary information sources, direct observation and laboratory diagnosis;

- k. Submit a report to veterinary authority;
- l. Provide feedback with the relevant stakeholders (general).

3.4.2.4 Abattoir surveillance

Abattoir surveillance for the detection of CBPP lesions at all slaughtering facilities should be conducted;

The suspected pathological findings (lung hepatisation, lung adhesions, sequestra, etc....) should be confirmed by laboratory testing. There is need to establish an animal identification and traceability system. To achieve good results there is need to train abattoir/slaughter personnel and meat inspectors' on the recognition of pathological lesions of CBPP. Abattoir records on pathological findings, including lung condemnation will be submitted to the Central Epidemiology Unit and entered in the central data base, analyzed and reports generated.

3.4.2.5 Outbreak investigation

This will be undertaken immediately after the first index case has been confirmed in a population. In the event that positive CBPP test-results are received, the Veterinary Services will do the following:

- a. Mobilize the Rapid Response Teams (RRTs) from their bases to the affected areas;
- b. Use standardized CBPP outbreak investigation form. Sero-surveillance and abattoir surveillance to be done in order to determine the extent of the disease.
- c. Collect data and information on temporal and spatial distribution of CBPP outbreak, the species of animals affected and the numbers affected and dead;
- d. Samples will be collected, transported, stored and analyzed in the laboratory;
- e. Data will be entered in the central epidemiology unit database;
- f. Data will be analyzed and reports generated thereof;
- g. Provide feedback to the relevant stakeholders'
- h. Notify the OIE and other organizations;
- i. Declare the end of CBPP outbreak when there is absence of clinical disease evaluated through two participatory disease search within 30 days in an area; quarantine restrictions will be lifted and members of the public advised accordingly.

4.0 CBPP Laboratory Detection, Diagnosis and Vaccine

These activities will be carried out at two levels:

- a. For national disease control programmes, the laboratory manager should use CVO/DVS approved tests based on OIE and the country's laboratory capacity.
- b. For livestock export trade and any other animals moving internationally, all laboratory testing must use OIE approved tests, or other tests as agreed to between importer and exporter.

4.1. Minimum pre-requisite in laboratory detection of CBPP

All countries in the GHoA should have a capacity to carry out basic diagnostic tests that can identify CBPP;

For disease confirmation either CFT or c-ELISA (with supporting epidemiological information);

Laboratories should have Standard Operating Procedures (SOPs) for biosecurity and biosafety on sample collection, handling, packaging, transportation and storage;

Should create a schedule for participation in proficiency testing programmes to improve laboratory standards and harmonization;

All countries in the GHoA may carry out sero-monitoring to evaluate progress in sero-conversion using c-ELISA;

Cattle in export trade should be subjected to laboratory testing using OIE approved tests and protocols (CFT and c-ELISA), or as may be required by the importing country;

Samples should be collected according to the expected laboratory assays to be performed.

4.2. Field diagnosis, sample collection, transportation and storage

4.2.1 Clinical diagnosis

CBPP is mainly a respiratory disease that can manifest in 3 forms;

- a. Peracutely affected cattle can die within 1 to 3 days with minimal clinical signs;
- b. In acute disease, the initial signs are high fever, followed by anorexia, frequent coughing and labored breathing. The cough is violent and productive;
- c. Chronic CBPP (2-3 weeks after onset of signs) is characterized by a chronic cough, nasal discharge, and debilitation. Painful breathing and coughing, grunting when breathing, head and neck extended when standing with front legs apart, dilated nostrils and open mouth panting for air, swelling of throat and dewlap in some animals, animal coughing after exercise and lameness in calves up to six months due to painful limb joints;
- d. Young animals may have complications of severe arthritis with swelling of the joints.

4.2.2 Post mortem examination

The lesions of CBPP are mainly found in the respiratory system. Typical post mortem findings with CBPP infections include the granular appearance of one or both lungs and fibrinous pneumonia, in which the lung is covered with fibrin and there is excessive fluid in the thoracic cavity. Some long term survivors have chronic pleuropneumonia or chronic pleuritis, with encapsulation of acute lesions and numerous adhesions to the chest wall.

The thoracic cavity may contain large amounts of clear yellow or turbid fluid mixed with fibrin flakes. The organs in the thorax are often covered by thick deposits of fibrin.

The disease is largely unilateral with over 80–90% of cases affecting only one lung. The affected portion appears enlarged and solid. On section of the lung, the typical marbled appearance of Pleuropneumonia is evident due to the widened interlobular septa and subpleural tissue that encloses gray, yellow or red consolidated lung lobules.

Histopathologically, this is a severe, acute, fibrinous pneumonia with fibrinous pleurisy, thrombosis of pulmonary blood vessels, and areas of necrosis of lung tissue; the interstitial tissue is markedly thickened by edema fluid containing much fibrin. In chronic cases, the lesion has a necrotic center sequestered in a thick, fibrous capsule, and there may be fibrous pleural adhesions.

4.2.3 Sample Collection and transportation

Samples will be collected according to the expected laboratory assay to be performed but basically the following are required:

4.2.3.1 For antigen detection or mycoplasma isolation

Suitable samples are:

a. In live animals

It is recommended to collect nasal swabs or nasal discharges. These may be heavily contaminated; therefore, whole blood for bacteriology/culture or mycoplasma antigen detection may be collected from suspect animals.

The samples must be collected aseptically.

b. In dead animals/and or slaughtered animals

Lungs with lesions, pleural fluid, lymph nodes of the broncho-pulmonary tract, content of sequestra (in case of chronic form) and synovial fluid from those young animals with arthritis should be collected.

The samples from individual animals should be collected from lesions at the interface between diseased and normal tissue. Tissues should be collected in sterile normal saline and transported under refrigeration or on ice to laboratory; and for histopathology preserve the tissues in 10% formalin.

4.2.3.2 For antibody detection

Collect serum for antibody detection

4.2.3.3 Transport and Storage of samples

- a. Samples for Mycoplasma detection and/or isolation must be kept chilled and transported under refrigeration or on ice to the laboratory;
- b. When dispatching samples to the laboratory, it is advisable to use a transport medium- Newings Tryptose Broth (where necessary) that will protect the mycoplasmas to prevent proliferation of other bacteria;
- c. Tissue samples must be kept cool at 4°C within a maximum of seven days or frozen at below -20°C for a longer period;
- d. Serum should be kept at 4°C only for 24 hrs, and at -20°C for longer storage
- e. For laboratory-to-laboratory transfer, lung fragments or pleural fluid can also be freeze-dried;
- f. The samples must be conditioned individually by type of tissue;
- g. The containers must be watertight, robust and be closed in a way to avoid any possibility of leakage.

4.3. Sample Testing

All laboratory procedures described in this SMP are as prescribed in the OIE Terrestrial Manual. Sample testing will be carried out in laboratories approved by the veterinary authorities.

4.3.1. Direct diagnostic assays-

4.3.1.1 Identification of the agent.

- a. Culture - in appropriate broth or agar media for Mycoplasma;
- b. For routine field use, the immunological tests and PCR are sufficient, but where these give dubious results, biochemical tests may be used;
 - i. These biochemical tests should be carried out by a reference laboratory. MmmSC is sensitive to digitonin, does not produce 'film and spots', ferments glucose, reduces tetrazolium salts (aerobically or anaerobically), does not hydrolyse arginine, has no phosphatase activity and has no or weak proteolytic properties;
 - ii. Nucleic acid recognition methods – PCR is sensitive, highly specific, rapid and relatively easy to perform;

- c. Immunological tests – These include:
 - i. Indirect fluorescent antibody test: on smears from clinical material using hyperimmune rabbit serum against MmmSC and labelled anti-bovine IgG;
 - ii. Fluorescent antibody test: on broth and agar cultures;
 - iii. Disk growth inhibition test: on a solid medium by a specific hyperimmune serum;
 - iv. AGID test on pleural fluid, ground lung fragments or even sequestrate;
 - v. Dot immunobinding on membrane filtration: for routine identification tests in the laboratory;
 - vi. Immunohistochemistry; vii. Histopathology.

4.3.1.2 Antibody detection tests– these are valid at the herd level only

- a. Complement fixation (Campbell and Turner method - a test suitable for determining freedom from disease and was prescribed for international trade);
- b. C-ELISA developed by the OIE Collaborating Centre for the diagnosis and control of animal diseases in tropical countries (a prescribed test for international trade). Compared with the CF test, the C-ELISA has equal sensitivity and greater specificity;
- c. Immunoblotting test (IB);
- d. Other tests;
 - i. A rapid field Slide Agglutination Test (SAT) to detect specific agglutinins;
 - ii. A latex agglutination test has been developed that is easier to interpret than the SAT;

For CBPP, the CF test and ELISAs can be used in screening and eradication programmes, but the highly specific IB test should be used as a confirmatory test. However, the IB test is not fit for mass screening and may be difficult to standardize in countries with marginal laboratory facilities so IB testing should be performed in a reference laboratory.

4.4 Interpretation of diagnostic test and disposal of positive responding animals:

For national disease control programs, the disposal of positive animals and cohort animals may be as proposed in the disease control section;

For international livestock trade, testing at quarantine stations will be done according to OIE recommendations and/ in concurrence with importing nations regulations;

Disposal of positive animals and cohort animals for international shipment will be in accordance with importing nation's regulations and in concurrence with national program standards;

All diagnostic testing and interpretation will be done in accordance with OIE guidelines.

4.5. Vaccine

The commercially available CBPP vaccine (TI/44 or TI/sr) in the region contains freeze dried live (*Mycoplasma mycoides*).

The quality assurance should be performed by AU-PANVAC.

5.0 Disease Control

Preamble

Prevention and control of CBPP is undertaken through vaccination, quarantines, movement controls, slaughter of infected and exposed animals and cleaning and disinfection of the premises. It is recommended to formulate a vaccination strategy.

5.1 Disease control planning

Advance planning is critical for effective disease control operations. Following are three different planning necessities that must be designed within the framework of the SMP for CBPP.

5.1.1 Preparedness planning

Preparedness planning outlines what a government needs to do before an outbreak of a disease in order to be prepared for it. This includes all things that stakeholders must do e.g. capacity building, equipment procurement, personnel responsibility allocation, and training in all the disciplines that support effective disease control, epidemiology, laboratory, disease management, etc.

5.1.2 Contingency (rapid response) plan

Details what a government will do in the event of an incursion of a disease beginning from the point when a suspect case is reported. A pre-programmed plan for immediate response to a report of an outbreak of a TAD or other emergency disease with the goal of eliminating the index case and preventing an epidemic spread. It also refers to a response to an increase in prevalence of an endemic disease situation. The Rapid Response Plan includes three components: the Epidemiology Section for disease investigation; the Laboratory Section for confirmation and sampling; and the Disease Control Section for immediate disease control interventions if/as need be.

It is important that the epidemiology and disease control sections of veterinary departments be prepared for full cooperation with the disease control programmes in cases of disease outbreak. Pre-planning for index case response is critical so that time is not lost when an index case is reported; the following should be undertaken:

- a. Prepare kits with all equipment needed for effective rapid response to the index case;
- b. Coordinate plans between epi-surveillance, laboratory, and disease control sections;
- c. Ensure all needed equipment is identified and ready for action;
- d. Establish rapid response teams.

5.1.3 Recovery plan

The plan for the safe recovery or restoration of normal activities, although possibly with procedures and practices modified in light of the experience gained during the outbreak

5.2. CBPP Disease Response

5.2.1 Epidemiological Investigation

Determination of the extent of the disease outbreak and delineation of the outbreak area based on surveillance and diagnostic information as described in surveillance section. (3.4.2.5, Outbreak investigation)

5.2.2. Movement Control and Quarantine

The extensive pastoral production systems in GHoA and the inadequate enforcement of animal movement control in pastoral systems pose a challenge to CBPP control. However, the following measures need to be applied in case of CBPP outbreaks, when feasible and possible:

5.2.2.1. Movement control

Regulate movement for index flock and contact flocks by monitoring livestock movement control (checks posts, stock routes and border posts); control and regulate livestock markets in the infected and surrounding areas; any goats movement will be as directed by an authorized veterinary officer and a movement permit shall accompany moving animals; develop a harmonised regional policy enabling veterinary authorities to enforce movement control.

5.2.2.2. Quarantine:

Identify area to be quarantined; Apply quarantine measures as laboratory confirmation is awaited. Once CBPP is confirmed apply full quarantine in the identified area.

5.2.3 Vaccines and Vaccination

5.2.3.1 Vaccines

The attenuated MmmSC strains are commonly used for producing the vaccine. Its efficacy depends on the virulence of the original strain used in vaccine production. Attenuated virulent strains such as T1/44 and T1sr stimulate the best immunity but also induce severe undesirable local and systemic reactions in some instances (primo-vaccination). Research is ongoing to improving existing vaccines and for development of new thermostable, efficacious and safe vaccines. Currently there is no DIVA test for CBPP. However, vaccine performance monitoring can be carried out in diagnostic laboratories.

5.2.3.2 CCPP Vaccine Quality Control

It is recommended to use the quality assured/certified vaccine (AU-PANVAC Certificate). Sero-monitoring that involves sampling before and after field vaccination will be required

5.3 CBPP disease prevention and control approaches depending on disease status

5.3.1 Area of no known disease status

Efforts in this area will be undertaken to determine the disease status that will hence advise control measures.

5.3.2 Disease free area

Vaccinations for CBPP will not be carried out in this area. However, intense surveillance involving clinical examination and certification of cattle in the area will be undertaken. Cattle movement to and from the area will be closely monitored by the authorized veterinary personnel.

5.3.3 Endemic Areas

All cattle over 6 months of age will be vaccinated annually. Use only certified vaccine to control outbreak (AU-PANVAC); Records of all vaccinated livestock will be properly kept; Sero-monitoring shall be conducted on a randomly sampled population to confirm vaccination efficiency and vaccine efficacy. Further vaccination should be determined by the disease epidemiology and risk analysis. Mobilization of the community and awareness creation is required. Immediate notification of the diseases to OIE, AU-IBAR and RECs is key. Resource mobilization (financial and human) and operationalization of contingency plans is necessary; Permanent identification of vaccinated animals using approved official methods is necessary;

5.3.4 Epizootic Phase

In case an area is declared infected as a result of confirmed CBPP outbreak in any one of the described diseases status areas, the following measures can be put in place: Mass vaccination in the infected area through ring vaccination and markets should be closed in response to the outbreak.

5.3.4.1 Movement Control and Quarantine

The objective of movement control and quarantine is to minimize the spread of disease and to mitigate its spread. Both quarantine and movement control as disease control tools should be enhanced.

5.3.4.1.1 Movement control

Regulation of livestock movement is a routine activity and animals are only moved when their health status does not pose a risk to animals in their destination. Regulating movement of animals from an infected area to disease free areas protects CBPP clean animals but does not completely prevent spread of the disease. The pastoral production systems in GHoA and the inadequate enforcement of animal movement control pose a challenge to CBPP control.

Effective livestock movement control should among others focus on markets operations, check posts, stock routes and border post management/controls. Any livestock movement will be as directed by an authorized veterinary officer and a movement permit shall accompany moving animals. Movement control can have adverse effects e.g. increased use of informal routes/trade if not well managed. Therefore communication with stakeholders and use of other strategies to limit disease spread is necessary.

5.3.4.1.2 Quarantine

The application of quarantine is not very useful as it is difficult to enforce in pastoral systems

- a. Apply provisional quarantine as laboratory confirmation is awaited and lift the provisional quarantine if CBPP is not confirmed;
- b. Once CBPP is confirmed apply full quarantine in the identified area;
- c. Quarantine is imposed immediately the index case is identified;
- d. Close livestock markets;
- e. Stop and enforce of livestock movement control;
- f. Create awareness and buy-in for the control measures;
- g. Continuous surveillance is carried out to monitor new cases;
- h. Quarantine is lifted four weeks after the last case.

5.3.4.2 Test and slaughter and treatment of sick animals

Test and slaughter policy can be considered whenever applicable. If some animals test positive the 'test and slaughter' principle may apply, where owners sell the animals for slaughter under supervision. Re-stocking should require all entries to test negative for CBPP. Treatment promotes carrier state and is discouraged

6.0 Disease Reporting and Information Management

All surveillance data collected goes immediately to the designated epidemiologist for analysis, who will be responsible for advising disease control decision makers.

Upon confirmation of the first case, an immediate notification to OIE, AU-IBAR and all Departments of Veterinary Services in the GHoA region.

Capacity building on information management is crucial to handle data emanating from surveillance, laboratory diagnosis and response activities. To realize this, countries in the region are advised to:

- a. Adopt a common information management system such as ARIS-2 or any other system;
- b. Strengthen the national disease notification system;
- c. Strengthen information sharing with stakeholders within countries and in the region.

7.0 CBPP and Trade

CBPP is one of the trade sensitive diseases around the world.

Export trade stock for Middle East, North Africa and other destinations shall pass through export quarantine stations as required by the importing countries. Protocols for the quarantine stations are well defined and dealt with in the SMP for Quarantines in the IGAD Region. All testing protocols used should be OIE approved or as agreed with the trading partner.

Trade stock moving within the IGAD Regional Economic Community area or leaving the Eastern African region for other international destinations should be subjected to quarantine and testing requirements of the importing nation.

- a. Non-symptomatic export animals from clean areas may enter export quarantine stations. This includes animals kept since birth, or for the past 21 days in establishment where no case of CBPP was officially reported or where the establishment was not situated in CBPP infected zone;
- b. Animals should be kept in quarantine station for 21 days prior to shipment; during this period animal samples are tested for presence of causative agent or antibodies (paired sera 21 days apart) and observation for absence of clinical signs;
- c. Animals should not show clinical signs of CBPP on the day of shipment;
- d. Animals vaccinated against CBPP should be shipped in not less than 15 days and not more than 6 months;
- e. Vaccination within the export quarantine stations shall be done as per OIE standards;
- f. Risk analysis in respect to CBPP in cattle intended for trade promotes trade;

8.0 Risk Analysis and Risk Mapping

8.1. Risk analysis

The risk analysis (RA) paradigm includes four components—hazard identification, risk assessment, risk management, and risk communication. Risk assessment is a scientifically based process of evaluating hazards and the likelihood of exposure to those hazards, and then estimating the resulting impact. The risk management phase involves using all of the information gathered during the assessment to evaluate policy options. Risk communication refers to communicating the results of the risk analysis involving all stakeholders.

It is essential for the countries in Greater Horn of Africa to better understand the disease situation in order to implement appropriate disease control strategies that will progressively control CBPP. In this regard, risk analysis is required to:

- a. Determine the risk of CBPP introduction (release, exposure and consequence) to areas of no known disease and to mitigate the risk due to CBPP;
- b. Assess the progress of intervention in the control CBPP in endemic and epidemic areas;
- c. Communicate the results of RA to all the relevant stakeholders to assist in the mitigation of CBPP.

8.2. Risk Mapping

Risk mapping is a critical issue and must be kept up to date. It is very important to know endemic areas for planning of increased surveillance and epidemiology, prevention (vaccination) campaigns, disease control interventions, distribution of public information, among others.



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