



**USAID**  
FROM THE AMERICAN PEOPLE



AFRICAN UNION  
**INTERAFRICAN BUREAU  
FOR ANIMAL RESOURCES**

*Standard Methods and Procedures (SMPs)  
for Control of  
**Camel Pox (CP)**  
in the Greater Horn of Africa*





***Standard Methods and Procedures (SMPs)***  
***for Control of***  
***Camel Pox (CP)***  
***in the Greater Horn of Africa***

This information product is made possible by the support of the American People through the United States Agency for International Development (USAID). The contents of this information product are the sole responsibility of the authors and do not necessarily reflect the views of USAID, the United States Government or AU-IBAR.

All rights reserved. Reproduction and dissemination of material in this information product for educational or other non-commercial purposes are authorised without any prior written permission from the copyright holders provided the source is fully acknowledged. Reproduction of material in this information product for resale or other commercial purposes is prohibited without written permission of the copyright holders.

Applications for such permission should be addressed to:

The Director  
African Union – Inter-African Bureau for Animal Resources (AU-IBAR)  
Kenindia Business Park  
Museum Hill, Westlands Road  
P.O. Box 30786  
00100, Nairobi, KENYA  
or by e-mail to: [ibar.office@au-ibar.org](mailto:ibar.office@au-ibar.org)

**ISBN: 978-9966-077-27-1**

© AU-IBAR 2015

---

Citation: AU-IBAR, 2015. Standard Methods and Procedures (SMPs) for Camel Pox (CP) in the Greater Horn of Africa, Nairobi.

## Table of Contents

	<b>Foreword</b>	<b>vi</b>
<b>1.0</b>	<b>Introduction</b>	<b>1</b>
1.1	Standard Methods and Procedures (SMP)	1
1.2.	Camel pox	1
<b>2.0</b>	<b>Definitions</b>	<b>3</b>
2.1	Surveillance and Epidemiology	3
2.2	Area Disease Status	4
2.3	Planning Documents	4
2.4	Personnel	5
<b>3.0</b>	<b>Surveillance and Epidemiology</b>	<b>7</b>
3.1	Case definition for camel pox	7
3.2	Predisposing Factors	7
3.3	Surveillance of CP according to disease status	7
3.4	Administrative Preparations	8
<b>4.0</b>	<b>Camel Pox Laboratory Detection, Diagnosis and Vaccines</b>	<b>13</b>
4.1	Minimum pre-requisite in laboratory detection of camel pox	13
4.2	Field diagnosis, sample collection, transportation and storage	13
4.3	Sample testing	14
4.4	Interpretation of diagnostic test and disposal of positive responding animals:	15
4.5.	Vaccine	15
<b>5.0</b>	<b>Disease Control</b>	<b>17</b>
5.1	Disease control planning	17
5.2.	Camel pox Disease Response	18
5.3	CP disease prevention and control approaches depending on disease status	19
<b>6.0</b>	<b>Disease Reporting and Information Management</b>	<b>21</b>
<b>7.0</b>	<b>Camel Pox and Trade</b>	<b>23</b>
<b>8.0</b>	<b>Risk Analysis and Risk Mapping</b>	<b>25</b>
8.1.	Risk analysis	25
8.2.	Risk Mapping	25

## **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 Camel Pox (CP), and deals with the specific dynamics of CP prevention and control in the Greater Horn of Africa (GHoA).

The compilation of the materials in the SMPs for CP, 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 CP 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 harmonised 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 camel pox (CP) and specifies standard, methods, and procedures for surveillance, diagnosis and control of the disease.

It provides the basis for coordination and harmonization of camel pox regulations and control in the region.

### **1.2. Camel pox**

Camel pox is a wide-spread infectious viral disease which occurs in every country where camel husbandry is practiced. It occurs throughout the camel-breeding areas of Africa, the Middle East and Asia, causing economic impact through loss of production and sometimes death. The Camel pox virus belongs to the family Poxviridae, subfamily Chordopoxvirinae, genus Orthopoxvirus.

The disease is characterized by fever, skin nodules, enlarged superficial lymph nodes, vesicles or pustules with crusts on head, eyelids, nostrils, neck, limbs, genitalia, mammary glands and perineum. Affected animals may show lacrimation, muco-purulent nasal discharge and abortion in pregnant camels. Diarrhoea may be observed in sick animals.

## *Camel Pox (CP)*

The clinical manifestations range from inapparent infection to mild, moderate and, less commonly, severe systemic infection and death. Transmission is by either direct contact between infected and susceptible animals or indirect infection via a contaminated environment. The role of insects in transmission has been suspected because the disease is often observed after rainfall.

Camel pox virus is very host specific and does not infect other animals. Only one suspected case of human Camel pox involving mild skin lesions has been described, underlining that Camel pox is of no public health importance. Camel pox is a serious production disease with effect on livelihoods and has specific requirements for international trade.

For the purpose of execution of this SMP, the camel pox disease status in the GHoA will be categorized into four main areas: Area of no known disease occurrence; camel pox disease free areas, camel pox endemic areas and camel pox epizootic area.

Contingency planning for control of CP is based on effective control of any outbreak of the same. 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**

This is 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 observation of the main signs of disease.

#### **Clinical surveillance**

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

#### **Targeted surveillance**

A form of active surveillance based on probability of occurrence of disease in a given area and/or species.

#### **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.

## **Predisposing factors**

Predisposing factors are a variety of situations that harbor or promote 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 Area Disease Status**

### **Area of no known disease occurrence**

It is an area where the disease has never been reported.

### **Disease free area**

A defined geographical area with no clinical cases of CP disease seen occurring or reported for the past three years without vaccination.

### **Endemic area**

An area where CP is constantly present in a susceptible animal population

### **Epizootic phase**

It is a period when CP 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 transboundary animal disease or other emergency disease with the goal of eliminating the index case and preventing an epizootic 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/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 camel pox**

Camel pox is a viral disease affecting camels and showing the following clinical signs: fever, skin nodules, enlarged superficial lymph nodes. There is eruption of vesicles/pustules with crusts on the skin of head, eyelids, nostrils, neck, limbs, genitalia, mammary glands and perineum. Affected animals may show lacrimation, muco-purulent nasal discharge and abortion in pregnant camels.

A tentative diagnosis of camel pox can be proffered based on clinical signs but laboratory confirmation is required for differential diagnosis with other diseases in the pox complex with similar signs such as ecthyma (ORF), papilloma virus, and reaction to insect bites in the early clinical stages and in mild cases of camel pox.

### **3.2 Predisposing Factors**

The following are the factors:

The occurrence of camel pox is underpinned by risk factors related to environment, 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.

Camel pox is mostly reported in naïve populations and is severe in younger animals. The presence of chronically infected animals in close proximity with naïve animals is also an important predisposing factor, through contact transmission. The disease occurs more frequently and more severely in young animals and usually during rainy season due to suspected involvement of arthropod vectors.

Other factors are poor nutrition and concurrent parasitic and bacterial infections which aggravates clinical disease. Animal movement (due to internal insecurity, camel thefts, informal trade, watering and grazing, marketing) accompanied by porous borders and poor cross-border quarantine systems are also key predisposing factors for camel pox spread.

### **3.3 Surveillance of CP according to disease status**

#### **3.3.1 Surveillance in areas of 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 needed, and appropriate reactions to suspicious cases are implemented.

### **3.3.2 Surveillance in disease free areas**

Surveillance aims at detecting as early as possible camel pox emergence or re-emergence and also demonstrating the absence of the disease or infection. The surveillance is categorized into passive and active surveillance. Active surveillance includes syndromic (clinical) surveillance, sero-surveillance and abattoir surveillance. The approach in active surveillance is targeted or risk-based according to the perceived risk factors such as neighboring to an infected area with or without disease.

### **3.3.3 Surveillance in endemic areas and during epizootic phase**

The aim of surveillance is to determine the level of occurrence and distribution of the disease in the area. In addition, surveillance in endemic and epizootic phases provides data for use in risk analysis and targeted interventions.

The activities to be carried out include passive surveillance, and active surveillance. Active surveillance will include pathogen profiling that include syndromic surveillance; clinical surveillance; participatory epidemiology; and outbreak investigation of suspicious cases.

## **3.4 Administrative Preparations**

- a. Veterinary personnel working at all administrative levels must be trained on disease reporting using appropriate reporting data management systems and feedback, e.g. ARIS 2 and other national systems;
- b. The veterinary department 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 personnel at all levels;
- d. Provide policy or legal frame work supportive of surveillance.

### **3.4.1 Passive surveillance and Passive surveillance field actions**

The principle in passive surveillance is to enhance early warning and prediction of possible outbreaks. Disease reporting and outbreak investigation of suspect cases is essential. Reporting will be guided by the case definition. The reporting should be from the lowest veterinary jurisdiction or village to the higher level authorities.

- 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. 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 camel pox outbreak from the community, the responsible veterinary personnel, in collaboration with relevant ministries, will conduct outbreak investigation with sample collection and submission to the laboratory. The field staff may 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 camel pox antibodies, pathogen and clinical disease in both infected and areas without the disease. In order to achieve this objective, the following will be done:

Active Surveillance may involve one or more of the following activities: Sero-surveillance, syndromic surveillance; clinical surveillance; participatory disease 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 at hand;
- b. Use a pre-designed survey protocol outlining sample size determination, sampling method, target population, sampling units and sampling frame taking into consideration livestock population;
- 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 using appropriate tools and techniques such as Vacutainers, filter paper, microbleeders, syringes, etc.;
- h. Ensure a proper environment and ample time for serum separation, and proper storage of sera;

- i. Ensure accurate labeling of samples, maintenance of test and identification records, proper management of samples cold-chain, and proper laboratory submission procedures;
- j. Ensure data is 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 camel pox could be conducted by analysis of cryo-preserved sera from previous active surveillance programmes for other diseases in the target population for camel pox antibodies.

#### **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 pustules, pox like lesions on camel skins high morbidity in young animals, will be investigated in order to confirm or rule out camel pox;
- 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 camel pox was not found in the herd;
- e. Provide feedback to the relevant stakeholders.

#### **3.4.2.3 Abattoir surveillance**

Should focus on ante-mortem inspection of camels at slaughter

#### **3.4.2.4 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 pox and nodules 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 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. Share reports generated thereof promptly with the relevant stakeholders to enhance ownership.

#### **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 camel pox 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 camel pox outbreak investigation form. In addition, conduct sero-surveillance and abattoir surveillance in order to determine the extent of the disease. It is worth noting that Sentinel herd surveillance will not be practical at this point because most of the herds in the area will be infected.
- c. Collect data and information on temporal and spatial distribution of camel pox outbreak, the species of animals affected and the numbers affected and dead;
- d. Collect, transport, store and analyze samples in the laboratory;
- e. Ensure data is entered in the Central Epidemiology Unit database;
- f. Ensure data is analyzed and reports generated thereof;
- g. The reports generated thereof will be shared with the relevant stakeholders;
- h. Notify the OIE and other organizations;
- i. Inform members of the public of the outbreak through appropriate media and gazettement;
- j. Declare the end of camel pox outbreak when there is absence of clinical disease within 30 days from the last confirmed case in an area; quarantine restrictions will be lifted and members of the public advised accordingly.



## 4.0 Camel Pox Laboratory Detection, Diagnosis and Vaccines

These activities can be carried out at two levels depending on the purpose:

- a. For national disease control programmes, the laboratory manager should use CVO or 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 per the agreement between importers and exporters.

### 4.1 Minimum pre-requisite in laboratory detection of camel pox

- a. All countries in the GHOA should have capacity to carry out basic diagnostic tests that can identify camel pox;
- b. Laboratories should have standard operating procedures for biosecurity and biosafety on sample collection, handling, packaging, transportation and storage;
- c. Care should be taken (use Personal Protective Equipment –PPE) while collecting samples due to the possible zoonotic nature of the disease;
- d. Create a schedule for participation in proficiency testing programmes to improve laboratory standards and harmonization;
- e. The basic assays which should be performed includes:
  - For Antigen detection;
    - » Virus isolation in embryonated eggs;
  - For antibody detection, currently (2015), there is no available basic commercial test;
- f. Camels in export trade may be subjected to laboratory testing using OIE approved tests or protocols according to the agreement between importers and exporters.

## 4.2 Field diagnosis, sample collection, transportation and storage

### 4.2.1 Clinical diagnosis

- Clinical signs suggestive of Camel pox are ;
- Skin lesions that include nodules, vesicles/pustules with crusts on the skin of head, eyelids, nostrils, neck, limbs, genitalia, mammary glands and perineum;
- Enlarged superficial lymph nodes;
- Other signs include, fever, lacrimation, muco-purulent nasal discharge, abortion and diarrhea;

### 4.2.2 Post mortem examination

- External lesions include skin nodules on the body;
- Internal pox lesions include;

- » Multiple pox-like lesions on the mucous membranes of the mouth, respiratory and digestive tracts;
- » Size of lung pox lesions may vary in diameter between 0.5 and 1.3 cm, occasionally up to 4–5 cm. Smaller lesions may have a haemorrhagic centre.

#### **4.2.3 Sample Collection**

##### **Collection of samples in the field**

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

- In live animals:
  - » Skin scrapings, thick skin papule biopsies, scabs, aspirates of lymph nodes, vesicular fluids, whole blood (in anticoagulant) and serum;
- In dead animals:
  - » Samples include: skin lesions, lung lesions (including normal tissue), lymph nodes and other organs with pox like lesions;
  - » For histopathology preserve the tissues in 10% formalin.

#### **4.2.4. Transport and Storage of samples**

Samples must be chilled and transported to the laboratory as soon as possible;

- If the samples delay, preserve in 10% glycerol/PBS or saline to preserve the sample;
- The samples must be kept cool at 4°C if stored for a few days or frozen at or below –20°C for a longer period;
- 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 Manual of diagnostics. Sample testing will be carried out in laboratories approved by the veterinary authorities.

#### **4.3.1 For antigen detection or virus isolation**

- Virus Isolation
  - » In Embryonated eggs
  - » In cell culture – Vero, MS Monkey, BHK, MA-104, Dubai camel Skin (DUBCA), chicken embryo fibroblasts, calf kidney
- Antigen detection/Nucleic acid detection
  - » PCR
  - » Immuno-histochemistry

#### **4.3.2. Antibody detection**

- ELISA – is easy, but there is need for production of own biological reagents
- VNT- Is the most specific serological test, but not sufficiently sensitive since immunity to camel pox infection is predominantly cell mediated – individual infected animals may only produce undetectable low levels of neutralizing antibody. It is, however, an inappropriate test at herd level.

#### **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. Capacities of national laboratories should be enhanced to carry out PCR and Virus isolation but where this is not possible, then regional support laboratories can be identified to do the same.

Any confirmed positive sample must be immediately reported to the Chief Veterinary Officer.

#### **4.5. Vaccine**

- The commercially available camel pox vaccine in the region contains a live attenuated freeze dried camel pox virus vaccine and provides protection for up to seven years.
- Quality assurance should be undertaken by AU-PANVAC



## 5.0 Disease Control

### Preamble

Prevention and control of Camel Pox is undertaken through vaccination, quarantines, livestock movement controls, vector control, slaughter of infected and exposed animals and cleaning and disinfection of the premises.

### 5.1 Disease control planning

Advance planning is critical for effective disease control operations. The following are three different planning necessities that must be designed within the framework of the SMP for Camel pox.

#### 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

Describes 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 transboundary 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. Camel pox 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 Camel pox control. However, the following measures need to be applied in case of outbreaks, when feasible and possible:

#### **5.2.2.1. Movement control**

Regulate movement of the index flock and contact flocks by monitoring livestock movement at check points, stock routes and border posts; control and regulate livestock markets in the infected and surrounding areas; any movement of camels should be as directed by an authorized veterinary officer; camels under such authorized movement should be accompanied with a movement permit; develop a harmonised regional policy enabling veterinary authorities to enforce movement control.

#### **5.2.2.2. Quarantine**

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

### **5.2.3 Vaccines and Vaccination**

#### **5.2.3.1 Vaccines**

A live, attenuated vaccine provides protection against the disease for at least 6 years, probably longer. An inactivated vaccine provides protection for 1 year only.

#### **5.2.3.2 Camel Pox Vaccine Quality Control**

Quality assurance should be undertaken by AU-PANVAC.

### **5.3 CP disease prevention and control approaches depending on disease status**

#### **5.3.1 Area of no known disease occurrence**

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

#### **5.3.2 Disease free area**

Vaccinations against camel pox will not be carried out in this area. However, intense surveillance involving clinical examination and certification of camels in the area will be undertaken. Camel movement to and from the area will be closely monitored by the authorized veterinary personnel.

#### **5.3.3 Endemic Areas**

All camels over 6 months of age will be vaccinated. Use only certified vaccines to control outbreaks (AU-PANVAC); Records of all vaccinated camels should be properly kept; Sero-monitoring should be conducted on a randomly sampled population to confirm vaccination efficiency and vaccine efficacy. Further vaccination should be conducted according to 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 necessary. Undertake resource mobilization (financial and human) and operationalization of contingency plans; Undertake permanent identification of vaccinated animals using approved official methods;

#### **5.3.4 Epizootic Phase**

In case an area is declared infected as a result of confirmed camel pox 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 closure of markets 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 instituted.

###### **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 protects clean animals but does not completely prevent spread of camel pox. The pastoral production systems in GHoA and the inadequate enforcement of animal movement control pose a challenge

to control of camel pox.

Effective control of camel movement should focus on markets operations, checks posts, stock routes and border post management/controls among others. any movement of camels should be as directed by an authorized veterinary officer; camels under such authorized movement should be accompanied with a movement permit;. 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 spread disease 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. However apply the following measures:

- a. Apply provisional quarantine as laboratory confirmation is awaited and lift the provisional quarantine if camel pox is not confirmed;
- b. Once camel pox 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 livestock movement;
- f. Create awareness and buy-in for the control measures;
- g. Conduct continuous surveillance to monitor for new cases;
- h. Lift quarantine four weeks after the last case.

#### **5.3.5 Treatment of sick animals**

It is recommended to provide supportive therapy to animals with clinical signs. Culling for immediate slaughter reduces the impact of the disease.

#### **5.3.6 Vaccination in affected herds.**

Life-long immunity follows after natural infection hence there no need to vaccinate affected herds.

## **6.0 Disease Reporting and Information Management**

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

Upon confirmation of the first case, immediately notify 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 common information management system such as ARIS-2 ;
- b. Strengthen the national disease notification system;

Strengthen information sharing with other stakeholders within countries and in the region



## 7.0 Camel Pox and Trade

Camel pox is one of the trade sensitive diseases around the world. Camels destined for export trade for the Middle East, North Africa and other destinations shall pass through export quarantine stations as required by the importing countries, where all camel pox and other disease control requirements for importing nations will be met. Protocols for the quarantine stations are well defined and dealt with in the Standard Methods and Procedures for SMP for Quarantines in the IGAD Region. All testing protocols used are OIE approved Export.

Camels destined for trade moving within the IGAD Regional Economic Community area or leaving the Eastern Africa 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 camel pox was officially reported or where the establishment was not situated in camel pox infected zone.
- b. Animals should come from clean areas with identification and certification as per OIE standards;
- c. Animals 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 or;
- d. Animals should not show clinical signs of camel pox on the day of shipment;
- e. Animals vaccinated against camel pox should be shipped in not less than 15 days and not more than 6 months.
- f. Vaccination within the export quarantine stations should be done as per OIE standards.
- g. Use risk-based results to promote trade.



## **8.0 Risk Analysis and Risk Mapping**

### **8.1. Risk analysis**

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 to all relevant 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 camel pox. In this regard, risk analysis is required to:

- a. Determine the risk of camel pox introduction (release, exposure and consequence) to areas of no known disease and to mitigate the risk due to camel pox;
- b. To justify trade in livestock and livestock products
- c. Assess impact of camel pox
- d. To communicate the results of RA to all the relevant stakeholders to assist in the mitigation of camel pox

### **8.2. Risk Mapping**

Risk mapping is a critical tool that is used to create awareness and guide planning of disease surveillance and control. It is therefore important to understand the various risk factors that are important for the occurrence and distribution of Camel Pox in order to develop risk maps.



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

Kenindia Business Park  
Museum Hill, Westlands Road  
PO Box 30786  
00100 Nairobi  
Kenya

Tel: +254 (20) 3674 000

Fax: +254 (20) 3674 341 / 3674 342

Email: [ibar.office@au-ibar.org](mailto:ibar.office@au-ibar.org)

Website: [www.au-ibar.org](http://www.au-ibar.org)