



SOMALILAND

CBPP CONTINGENCY

PLAN

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## **1. NATURE OF THE DISEASE**

### **1.1 Definition**

Contagious Bovine Pleuropneumonia (CBPP) is an acute, subacute or chronic mycoplasmal disease of cattle, which may cause high production losses and mortalities. It is characterized by fibrinous pneumonia, sero-fibrinous pleuritis and oedema of the interlobar septa of the lungs.

### **1.2 World Distribution**

CBPP is currently mainly a disease of Africa, where it is regarded as one of the most serious transboundary animal diseases. Most countries in sub-Saharan Africa are endemically infected, with at least 27 countries reporting its presence. Exceptions are a number of countries in southern Africa, including Botswana, Malawi, Mozambique, Republic of South Africa and Zimbabwe, and all of the Northern border areas of Namibia. There was an upsurge in the incidence of CBPP in Africa in the 1990s and serious spread of the disease in eastern and parts of southern Africa, with reintroduction to areas that had been free for considerable periods.

CBPP has been present in some Mediterranean countries of Europe during the 1990s (Italy, 1993; Spain, 1993; Portugal, 1999). The disease may be present in parts of Asia, but this is uncertain. Other continents are free.

### **1.3 Aetiology**

CBPP is caused by *Mycoplasma mycoides* subsp. *mycoides* Small Colony variant (bovine biotype) (*MmmSC* for short). This is a member of the “mycoides cluster”, a grouping of six closely related mycoplasmas that are all pathogenic to a greater or lesser degree in ruminants. Members of the cluster have a high degree of serological and DNA relatedness. There is only one serotype of *MmmSC*.

*MmmSC* like other mycoplasmas lacks a cell wall and is pleomorphic. In young cultures it tends to appear as branching filaments, and in old cultures as small coccal bodies. It requires special media rich in cholesterol (added serum) for growth.

The organism is fragile and survives poorly outside host. It is sensitive to desiccation and disinfectants.

## **1.4 Epidemiological Features**

### **1.4.1 Susceptible species**

CBPP is mainly a disease of cattle. Both *Bos taurus* and *Bos indicus* breeds are fully susceptible. Camels, wild bovids e.g. buffaloes and other wild ruminants are resistant. The causative organism has been isolated from sheep and goats, but there is no evidence that these species play any part in the transmission of the disease.

### **1.4.2 Disease Transmission**

The disease is transmitted almost exclusively by direct contact between infected and susceptible cattle, by means of infected aerosols from exhaled air. Airborne spread up to 200 meters is thought to be possible. Conditions under which cattle are herded closely together favour rapid spread of the disease. Asymptomatically and chronically infected animals are very important in the spread of the disease to new areas. Chronic carriers are apparently healthy animals that have a localized focus of infection sequestered in a fibrous capsule in their lungs. Such animals are often referred to as "lungers". The organism can persist in such lesions for many months, and in time the fibrous capsule may break down, allowing viable organisms to escape by the bronchi and so infect susceptible in-contact animals. This is particularly prone to occur when chronic carrier animals are subjected to stress, such as when mustered or walked for long distances. As the mycoplasma

survives poorly in the environment, indirect methods of spread (e.g. by fomites) are unimportant.

### **1.4.3 Disease patterns**

**Epidemic** CBPP may occur when the disease is introduced to previously free herds, areas or countries. It is characterized by a high incidence of disease in herds with a high proportion of cases being at the acute end of the clinical spectrum and many deaths. Spread of infection within and between herds may be rapid, particularly under conditions where cattle are congregated together, such as at watering points and markets and when droving or *kraaling* animals.

In the early stages of an outbreak, the intensity of infection may be low and the resultant spread may be slow. Under these circumstances, it may take several months for the epidemic to build up momentum. This early period is particularly dangerous in terms of early detection and disease containment.

Because of the variable and often long incubation period, and the fact that the disease may have been introduced by apparently healthy animals, it is often difficult to trace the timing and source of the disease introduction.

Unless the disease is effectively controlled, it will eventually become **endemic** and this is the situation that pertains in much of Africa. Endemic CBPP is characterized by insidious spread, and a high proportion of cases being at the less acute and more chronic end of the clinical spectrum. The mortality rate is low. There are occasional flare ups, and overall there are still substantial production losses in the endemic situation.

### **1.5 Clinical Signs**

The incubation period is generally 3 to 6 weeks, but may be as long as 6 months. In the **acute** form, there is fever (lasting 3 to 10 days), anorexia, loss of milk production in milking cows, severe depression, and rapid, labored breathing, which is abdominal in nature. This is soon followed by dry coughing, which

progressively becomes more severe, and apparent chest pain, with the animal typically facing into the wind with its back arched, elbows out and head extended. There may be nasal discharge, sometimes streaked with blood, and frothy saliva accumulates around the mouth. The mortality rate from acute CBPP may be up to 75%, and death usually occurs within 3 weeks of the onset of clinical signs. Animals that recover are extremely weak and emaciated. Many become chronic carriers. A hyper-acute **form** may also occur in a few animals early in outbreaks - in this form, animals die with few premonitory signs.

**Sub-acute** and **chronic** cases are common. The clinical signs are milder and may not be detected. There may be an intermittent fever, some loss of condition, and respiratory signs that may become apparent only when the animal is vigorously exercised. **Subclinical** cases also occur.

In calves up to 6 months, CBPP may manifest itself only as arthritis, with lameness and a soft, puffy swelling of affected joints.

## **1.6 Pathology**

### **1.6.1 Gross pathology**

In acute CBPP, there is a severe fibrinous pneumonia with copious pleural exudate. The latter is a striking feature, and there may be up to 30 litres of yellow exudate, containing clots, in the chest cavity. One or both lungs may be partially or completely consolidated, giving a characteristic marbled appearance. Affected areas are swollen, vary from pink to dark red, have a moderately firm consistency, and exude clear fluid and sometimes blood from cut surfaces. The interlobular septa are grossly thickened. Pleural surfaces over affected areas are thickened, grey to red, and are often covered by friable, yellow fibrin. Local lymph nodes are enlarged, oedematous, and may contain areas of necrosis.

In chronic cases, necrotic lung tissue becomes encapsulated to form a sequestrum of 1 to 20 cm diameter. The tissue within the sequestrum [plural = sequestra] tends to retain much of the architecture of the acute lesion, but may eventually become calcified or liquefied. The lesion may either break open to release viable

mycoplasmas or be resorbed. Pleural adhesions are commonly found in chronic cases.

### **1.6.2 Histopathology**

Microscopically, the earliest pulmonary lesions consist of foci of catarrhal bronchiolitis, with distension of the lymphatics in the interlobular septa and thickened alveolar walls. At the same time, or soon after, blood vessels and lymphatics become thrombosed, and alveoli are filled with fluid and cells (alveolar macrophages and sometimes polymorphonuclear leucocytes). There is proliferation of the cells in lymphatic follicles and an increase in the population of mononuclear cells around bronchioles. There is also lymphatic oedema, with distension of subpleural lymphatics.

Necrosis can occur early and tends to have a lobular distribution. It is often demarcated from living tissue by a zone of leucocytes and nuclear debris. A connective tissue capsule develops rapidly, but the necrotic material may persist for many months.

Resolution of the pneumonia is by slow connective tissue replacement of damaged tissue. This starts around blood vessels. A layer of mononuclear cells borders the connective tissue on the necrotic side, and connective tissue gradually moves in to replace the dead tissue.

## **1.7 Diagnosis**

### **1.7.1 Field diagnosis**

The occurrence of respiratory disease in a number of cattle in a herd (Plate 1) in which there is acute or chronic coughing, dyspnoea and loss of weight should be viewed as highly suspicious of CBPP. The cardinal respiratory signs to look for are fast, difficult and noisy breathing; discharge from the nose (Plate 2) and coughing, especially after exercise.

The gross lesions are highly characteristic. CBPP should be strongly suspected when there is yellow fluid in the chest cavity; lungs covered with yellowish material (Plate 3); lungs adhered to the chest wall; lungs that do not collapse and are solid, hepatized or marbled (Plate 4); or sequestra (Plate 5) can be seen in the

lungs of chronic cases.

**Plate 1. Appearance in the herd**



*(Photograph courtesy of A. Provost)*

This cow is having difficulty in breathing. It stands with its head and neck extended and legs widely placed. Often the elbows are turned out. Inflammation of the membranes surrounding the lungs causes pain in the chest, resulting in abdominal breathing movements.

The general condition is poor.

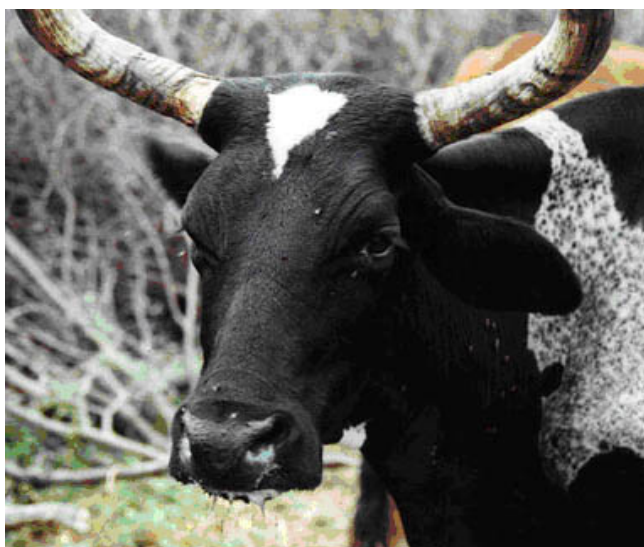
**1.7.2 Differential diagnosis**

The clinical signs and pathology of CBPP are fairly characteristic. Nevertheless, there are a number of diseases that may possibly be confused with it. These include:

- rinderpest,
- haemorrhagic septicaemia,
- East coast fever,
- bronchopneumonia resulting from bacterial or viral infections,

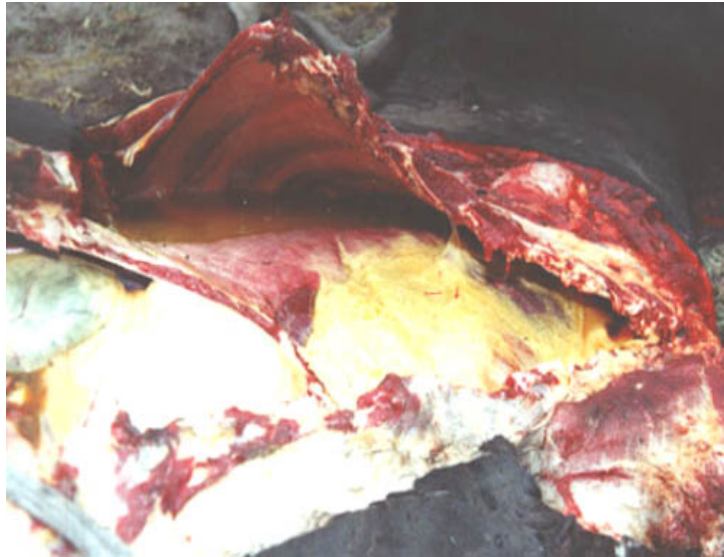
- acute pasteurellosis,
- bovine tuberculosis,
- actinobacillosis,
- traumatic pericarditis,
- abscesses, or
- hydatid cysts.

**Plate 2. Typical nasal discharge in a CBPP-infected animal.**



*(Photograph courtesy of Veterinary Tropical Diseases Department, University of Pretoria, Republic of South Africa).*

**Plate 3. Characteristic post mortem appearance**



*(Photograph courtesy of the University of Pretoria, Republic of South Africa)*

Part of diaphragm has been cut away to show heavy fibrin deposits ("omelette") on lungs and yellowish pleural fluid in chest cavity.

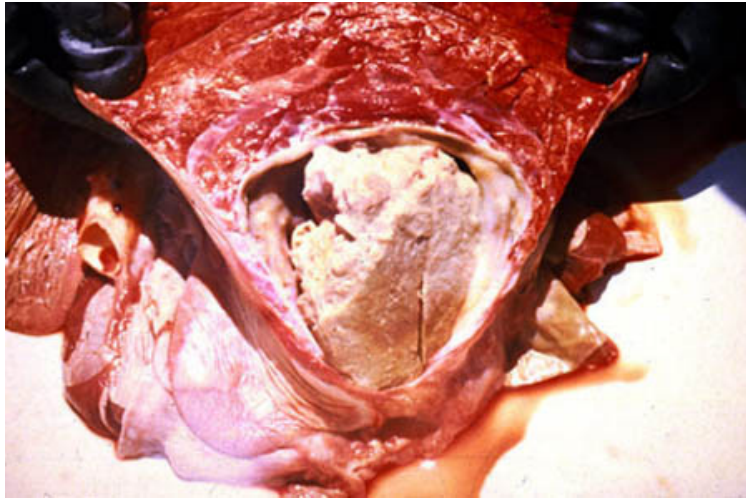
#### **Plate 4. Gross pulmonary change**



*(Photograph courtesy of W. Amanfu)*

Acute CBPP: Lungs cut to show red hepatization, i.e. liver-like appearance and feel to the lungs. Note the thickened interlobular septae.

#### **Plate 5. Chronic CBPP with sequestra**



*(Photograph courtesy of R. Windsor)*

Sequestra are typical lesions of CBPP to be looked for during meat inspection. Chronic cases of CBPP often have such lesions.

### **1.7.3 Laboratory diagnosis**

Whilst histopathology helps, definitive diagnosis is based on isolation and identification of the causative agent and/or the finding of specific antigens or antibodies by appropriate serological tests.

Detailed instructions for laboratory diagnostic procedures for CBPP are to be found in the OIE Manual of Standards for Diagnostic Tests and Vaccines (4th Edition, 2000; this can be found at [www.oie.int](http://www.oie.int)). The following is a summary, with the emphasis on the tests that are usually used.

#### ***Collection and transport of diagnostic specimens***

Specimens of lung tissue from obvious lesions, tracheobronchial and mediastinal lymph nodes, and at least 10 ml of pleural fluid should be collected aseptically. Joint fluid from affected joints of calves should also be collected. Duplicate tissue specimens should be collected into neutral buffered formalin for histopathology.

Blood samples, about 20 ml each, for serum should be collected from any cattle showing clinical signs, as well as from several apparently healthy animals in the affected herd.

Unpreserved tissue, pleural and joint fluid specimens are best placed in a transport medium that will protect the mycoplasmas and prevent the proliferation

of bacteria (heart infusion broth without peptone and glucose, 10% yeast extract, 20% serum, 0.3% agar, 500 IU/ml penicillin and 1:10 000 thallium acetate). These and serum specimens should be chilled and forwarded to the laboratory on water ice or with frozen gel packs.

### ***Culture and identification of MmmSC***

*MmmSC* can be isolated from unpreserved tissue and fluid specimens in suitable mycoplasma media such as Hayflick's or Gourlay's broth containing penicillin and thallium acetate. The organism is detected by regular dark-field microscopy examination of culture fluid for filamentous organisms. The causative organism is normally identified by growth inhibition tests and/or immunofluorescence test. Closely related *Mycoplasma* spp. may cause cross-reactions in these tests. Several new techniques that may overcome this problem are being developed and these include immunoblotting, immunoperoxidase and polymerase chain reaction (PCR) tests

### ***Antigen detection***

There are several antigen detection tests that may be useful in the confirmatory diagnosis, particularly in circumstances where good enough diagnostic samples cannot be collected for isolation of the organism. These include:

- Agar gel diffusion test - a practical and easy to perform test - may be used for the rapid detection of specific antigens in pleural fluid or ground lung tissues. A variation of this is the interfacial precipitation test.
- Indirect fluorescent antibody test, which can be applied on smears of pathological material using hyperimmune cattle serum against *MmmSC* and labelled anti-bovine IgG. The test is best used for smears of pleural fluid, although lung impression smears may also be used. The specificity of the method can be improved by counterstaining smears with Eriochrome black.
- Immunohistochemistry. *MmmSC* immunoreactive sites can be detected in the small bronchioles and alveoli and within the interlobular septa of lung lesions using the peroxidase-antiperoxidase (PAP) method on sections of paraffin embedded blocks. This is labour-intensive, but very useful, particularly on

animals that die suddenly of an acute infection.

- PCR is currently more of a research tool than a diagnostic test that can be routinely applied.

### ***Antibody detection***

At present, complement fixation (microtitre method) (CFT) is the preferred serological test for CBPP. The specificity of this test can be as high as 99.5% in acutely infected cattle, but the frequency of false-positive reactions may temporarily be higher in certain herds. The sensitivity of the test is limited, and it may fail to identify four classes of animals:

- animals in the very early stages of the disease;
- animals in the very late stages of the disease (CFT fails to detect 30% of animals with chronic lesions);
- animals with massive lesions, where the antibodies produced are overwhelmed by the antigen; and
- animals that have been treated with antibiotics in the early stages of the disease, which may fail to develop a detectable serological response.

The CFT reaction after vaccination is inconstant and short-lived (generally less than 3 months). The CFT is generally used as a herd test.

The competitive enzyme linked immunosorbent assay (c-ELISA) has been evaluated under field conditions in several African countries, with the assistance of the International Atomic Energy Agency (IAEA). It is at least as sensitive as the CFT, but as with other ELISA systems, increased sensitivity can only be achieved at the expense of specificity, and vice versa. It is a useful tool to measure the antibody levels on a herd basis.

The passive hemagglutination test, while not used routinely, may have a place in serological diagnosis. It is more sensitive than the CFT in early and late stages of disease, but the specificity is lower. It has a potential role as a screening test.

The slide agglutination test is simple to perform and could be used as a pen-side test. It is more sensitive in the early stages of the disease, but it lacks specificity.

## **2. LIVESTOCK SECTOR IN SOMALILAND**

### **2.1 Socio-economic importance**

Livestock production is the mainstay for the people of Somaliland employing over 70% of the population. It contributes 60% of the GNP and about 85% of foreign export earnings. It is the source of livelihood for about 250.000 pastoral, agro pastoral and peri-urban families. Livestock production contributes to government revenues and provides employment to a wide range of veterinary professionals and other service providers.

### **2.2 Production Systems**

The livestock production systems practiced in Somaliland depends upon the region, availability of labor, herd sizes and types of livestock kept. The two main production systems are nomadic pastoralism and agro-pastoralism. Other systems practiced are settled mixed farming and urban farming.

#### **2.2.1 Nomadic pastoralism**

Nomadic pastoralism is the system practiced by most of the rural population and involves the movement of people with their animals in search of pasture and water. The movement of these Pastoralists often organize and follow a regular pattern in which each group has their traditional grazing area, watering points and temporary camps. In some parts of the country pastoralists maintain agreements with farmers allowing them access to crop residues and fallow grazing land. Nomadic pastoralism is mainly confined to the drier areas of the coastal plains and mountain valleys and the plateau which covers most of the country. In some places the pastoralists take advantage of heavy rains and floods to plant crops in cleared areas for the production of grains. These are then used as forage once the crops have been harvested.

The types of animals kept by nomadic families depend on several factors including the area inhabited and the labor available to them. Rearing of cattle is

predominant in the western parts of the country that receive relatively more rainfall, while goats and camels are bred mainly in the drier central and northern parts of the country. Most pastoralists prefer to keep mixed species of animals; a practice which has benefits which include the ability to exploit different range lands, produce different products and have different survival and recovery rates during droughts.

When the need arises, pastoralists practice a split herding system in which camels and sometimes goats are herded separately away from the main camps where cattle, some milking camels and sheep are kept. There is also a distinct division of labour among family members in which young men herd camels while cattle and small ruminants are taken care of by women children and the elderly.

### **2.2.2 Agro-pastoralism**

Agro-pastoralism is a production system, which is characterized by the maintenance by a family of a permanent home base in a farming area. There is medium to high integration with crops and even very high integration in the flood plains where fodder can be grown. The sizes of herds kept by the farmers vary from large herds (60 to 100 animals) to only a few animals permanently residing on the farm.

This production system is now becoming more common even in the drier regions of the country as the pastureland gradually deteriorates. In this system split herding based on division of labor is also a common practice, as part of the family moves with most of the herd, while the other part is left in the farm land to cultivate crops; few milking animals are also left behind as well.

### **2.2.3 Settled mixed farming**

In settled mixed farming systems, there is medium to high integration with crops, particularly in the flood plain areas where fodder can be grown. Some land in these areas is enclosed (illegally in the traditional context) in order to grow fodder.

#### **2.2.4 Urban stall feeding**

The urban stall-feeding system is practiced around the main towns. The livestock owners buy fodder and crop by-products as feed for their livestock.

Herd and flock sizes vary among the different production systems. They are large to very large in the nomadic pastoral system, medium in the mainly transhumant agro pastoral system and small to very small in the settled mixed crop/livestock farming and urban stall-feeding situations.

Flock sizes are smaller for sheep than for goats in the central areas and average 31 head in the range 6-53 head. Flock structures are related mostly to meat production and comprise 76.1% females (of which those of breeding age are 55.9% of the total flock) and 23.9% males (of which rams of breeding age are 9.8% mature castrates 9.7% and young males either entire or castrated 4.5%).

#### **2.3 Livestock Movement Patterns**

Livestock movement occurs mainly in search of grazing pastures and water and also for trade. From April to October the animals graze on both sides of the border with Ethiopia on the Highland Plateau. They move freely across the border since the communities living in this region are the same. During the dry season (November to March) the pastoralists move the animals northwards to the coastal areas. They then move inland at the start of the rains in April.

Movement from the eastern part of the country to the western part is rare.

**Figure 1: Map showing movement patterns of livestock in the greater Somalia**



after a suspected presence in 1998.. RVF is otherwise enzootic throughout Sub-Saharan Africa and Madagascar and reached the Arabian Peninsula in 2000.

## **2.5 Livestock Markets and Marketing Systems**

Somaliland exports livestock to the Arabian Peninsula. Saudi Arabia banned Somali livestock in 2000 and this ban exists to date. However Somali traders have developed new market channels for both live animals and chilled carcasses in Yemen, Oman and the UAE albeit at lower prices.

Barbera is the main export port and is equipped with personnel who carry out inspection and certification of livestock before export.

## **3. Risk Analysis (including potential consequences)**

Somaliland has not confirmed CBPP within its cattle population. Preliminary qualitative risk analysis classifies most of Somaliland as being at high risk. The cattle population is small but trade in livestock for export is high with a lot of animals transiting through the country from high risk regions of the horn of Africa to the export seaports. In arriving at this conclusion the following risk factors were considered:

### **Release Assessment - Risk factors that influence the introduction of CBPP into Somaliland**

#### **1. Trade (legal/illegal/imports)**

Trade is a potential risk factor that facilitates the entry of CBPP disease into the country, especially from neighbouring countries where the disease surveillance and control measures are weak. A lot of cattle for export are sourced from Ethiopia and Southern and Central Somalia. The prevalence of CBPP in these countries is unknown. There is no official presence except at Berbera port, where veterinarians carry out inspection and certification of livestock (cattle, sheep, goats and camels) for export. The trade animals are not subjected to any tests before they are moved into Somaliland for export. They are often moved on hoof

and sometimes by vehicle. This poses a risk of causing disease among the local animals. To mitigate the potential risks, emphasis has been placed on implementing and maintenance of appropriate enforcement of movement control measures at the border crossing points and the setting up of holding grounds at the entry points where the animals can be tested before release.

## **2. Pastoralism**

Pastoralist communities living alongside the common borders of these countries move across the borders in search of pasture and water. The porous borders therefore increase the chances of disease entry. Policing the whole length of the Somaliland border with its neighbours is difficult. A regional approach in disease control of TADs involving coordinated measures being undertaken by the authorities of Somaliland, Ethiopia and Southern Somalia is envisaged.

## **3. Animal demographics and trade**

Cattle population in Somaliland has not been done for many years. At present it is estimated that the numbers of cattle are about 30,000 head. CBPP is transmitted by direct contact (droplet infection) between healthy cattle and diseased cattle or sub-clinical carriers. Even under extensive conditions, the gathering of animals at watering places or in homesteads at night will lead to outbreaks and will maintain the disease in a herd. The contact of animals from different families especially during the watering exercises and as they migrate in search of pastures further increases the risk of disease spread from the index herd. This disease may spread insidiously in a herd and may not be detected for several weeks or months after infected animals have entered an area. Some animals also have a degree of resistance to the disease and those surviving CBPP are even more resistant.

The Department of Animal Health has been working through the CBAHWs to detect any changes in the health of the cattle in these areas. The capacity to mitigate these risks will be strengthened through continuous training and awareness programmes targeting livestock owners and animal health service providers.

#### **4. Geographical and environmental factors**

Most of Somaliland is classified as arid and semi-arid with a climate characterized by low humidity and high temperatures. Its animals share one ecosystem with animals grazing in Ethiopia, Southern and Central Somalia and Puntland; none of which is considered as being free from CBPP. There is therefore a high risk of disease entry from these countries. The limited availability of pastures and water also results in livestock coming together at the few available watering points and grazing locations thereby increasing the risk of disease transmission

#### **5. Veterinary Services**

The existing surveillance system which is meant to protect the country from incursion by the disease through importation of high risk animals needs strengthening. The border entry points are poorly manned. Moreover, the borders with neighboring countries are long and highly porous with the nomadic communities living alongside them crossing them regularly in search of pasture and water for their animals. This is likely to increase the probability of entry of infection.

#### **Exposure Assessment - Risk factors that affect the spread of CBPP within the local cattle population**

The following factors would potentially contribute to the spread/transmission of the MmmSC in the event of an outbreak:

- Unsatisfactory levels of bio-security along the cattle value chain (production to consumption).
- Production system in practice (the predominant system practiced is nomadic pastoralism where cattle from different areas congregate at watering points). Transmission through contact is easy.
- Transport mode of animals for trade (cattle are trekked long distances to the export ports). These animals come into contact with local animals.
- Trade animals are not inspected before transportation and neither do they undergo certification before entering the country thereby increasing the risk of

sick cattle being moved.

- Animals are not quarantined as they enter the country but immediately move into the interior where they come into contact with local cattle.
- Lack of an effective veterinary surveillance and reporting system, which would act as an early warning system to pick out an outbreak before it spreads, is a significant risk factor in the entry and subsequent spread of CBPP within the country. The country also does not have operating laboratories, which can carry out any tests to establish the cause of the problem. This necessitates the transport of samples outside the country to laboratories in neighboring countries; a time consuming and expensive exercise.
- Awareness among the livestock keeping communities and animal health service providers of CBPP disease, its clinical manifestations in cattle and its potential economic impact. This lack of awareness and sensitization also includes key stakeholders who are crucial in the control of livestock movement (the main strategy of controlling the disease) that includes customs officers, local authorities' staff, law enforcers and traders who are not aware of the risks associated with the disease.
- The insidious nature of the disease which allows it to spread for a long time within herds without being detected. This may enhance the potential for its establishment and spread in the local cattle population.

### **Consequence Assessment**

Consequence assessment describes the potential consequences (direct and indirect) of an outbreak of CBPP in Somaliland.

In the event that the disease is introduced to previously free herds or areas of Somaliland then ***Epidemic*** CBPP may occur. It is characterized by a high incidence of disease in herds with a high proportion of cases being at the acute end of the clinical spectrum and many deaths. Spread of infection within and between herds may be rapid, particularly under conditions where cattle are congregated together, such as at watering points and markets and when droving.

In the early stages of an outbreak, the intensity of infection may be low and the resultant spread may be slow. Under these circumstances, it may take several months for the epidemic to build up momentum. This early period is particularly dangerous in terms of early detection and disease containment. Because of the variable and often long incubation period, and the fact that the disease may have been introduced by apparently healthy animals, it is often difficult to trace the timing and source of the disease introduction.

Unless the disease is effectively controlled, it will eventually become **endemic** and this is the situation that pertains in much of Africa. Endemic CBPP is characterized by insidious spread, and a high proportion of cases being at the less acute and more chronic end of the clinical spectrum. The mortality rate is low. There are occasional flare ups, and overall there are still substantial production losses in the endemic situation.

Other consequences would include:

- Environmental consequences such as the side effects of control measures.
- Economic considerations (compensation, control, eradication, monitoring and surveillance costs).

### **Risk Estimation**

Qualitative assessment of risk places Somaliland as moderate to high risk for the introduction and maintenance of CBPP although there is very little data and information available on the disease status within the country and in neighboring countries where trade animals are sourced. At risk would be the whole population of cattle within the country and in neighboring countries since there are no effective bio-security measures in place to prevent the outbreak from spreading.

### **Risk Management**

The country has to strive to achieve a balance between its desire to minimize the likelihood of an incursion of CBPP and its consequences and its desire to continue

exporting cattle sourced from other countries in the region which do not have effective veterinary systems to detect and deal with any CBPP infection within their respective national herds.

**To achieve the above there has to be an effective early warning system in place (characterized by continuous surveillance and reporting for TADs) coupled with an efficient and effective rapid response mechanism capable of containing and eradicating any outbreaks.**

### **Risk Communication**

It is crucial that all the information and opinions regarding an incursion of CBPP into the country is collected and disseminated to all stakeholders. To carry out this, a proposed risk communication strategy has been annexed to this plan.

## 4. Veterinary Services in Somaliland

### **Public Sector**

Veterinary services in Somaliland are provided by the Department of Animal Health Services within the Ministry of Livestock. The structure of the Ministry is shown in Annex 6. The country is divided into 6 administrative regions, each headed by a Regional Veterinary Coordinator. These are further divided into districts, which are headed by District Veterinary Officers.

Soon after the collapse of the military regime in Somalia, Somaliland separated from the rest of Somalia based on the original colonial boundaries and restored a democratic mode of governance on 18th May 1991. This was as a result of a series of negotiations between representatives of different clans who held a congress of elders from 27th April - 18th May 1991 in Burao, one of the towns of Somaliland. Constitutionally, Somaliland has a multi-party system of legislature with an elected local council and an elected President. Since 1991, the country has held 5 democratic elections, and has already established monetary as well as national policies to guide its operations.

**Table 1: Technical Personnel in the Department of Animal Health Services**

| <b>Station</b> | <b>Veterinarians</b> | <b>Vet. Assistants</b> | <b>Technicians</b> |
|----------------|----------------------|------------------------|--------------------|
| Hargeisa       | 13                   | 15                     | <b>5</b>           |
| Sanag          | 1                    | 7                      | <b>2</b>           |
| Togdheer       | 3                    | 9                      | <b>2</b>           |
| Awdal          | 2                    | 4                      | --                 |
| Sahil          | 2                    | 5                      | <b>5</b>           |
| Sool           | 2                    | 3                      | --                 |
| <b>Total</b>   | <b>23</b>            | <b>43</b>              | <b>14</b>          |

*Source: The Government of Somaliland*

### **Private Sector**

Somaliland has a vibrant private sector, which has grown as a result of the upheavals that the country has experienced since 1969 when the first government was ousted. During this period the national development continued to deteriorate and, together with occurrence of many civil conflicts, this led to the collapse of the military Government in early 1991, followed by destruction of all vital infrastructures.

### **Professional Livestock Associations**

The private sector has continued to operate under two main professional groups or associations, which are:

1. Somaliland National Veterinary Association (SoINAVA); it has a membership of 15 veterinarians, 20 veterinary assistants and 4 Technicians
2. United Livestock Professional Association (ULPA); it has a membership of 10 veterinarians, 51 veterinary assistants and 2 Technicians

Most of their members are found around Hargeissa. Some, mainly the veterinary assistants are based in the districts; they have strong linkages with CAHWs and

livestock owners.

The existing professionals (degrees and diploma holders) were trained more than 16 years ago and have not been exposed to current trends and new technologies in livestock development, thus they require refresher and advanced training in their respective disciplines. On the other hand, Community-based animal health workers have had limited level of training for long-term sustainability of their services.

### **Community Based Animal Health Service Providers**

There are 295 Community Animal Health Workers and Nomadic Health Auxiliaries trained by different NGOs/International organizations and are registered and operating in the country.

### **Non-Governmental Organizations**

The following NGOs are operating in the country:

1. Terra Nuova Consortium
2. COOPI
3. VSF-Swiss
4. VSF-Germany
5. FAO
6. UNDP
7. OCHA

They have 13 veterinarians and 2 veterinary assistants working under them.

### **Drug Outlets and Drug Distributors**

Drugs and vaccines are usually imported by private companies in conjunction with veterinarians. They have stores from which they distribute drugs to veterinarians who own pharmacies. Majority of the drugs and vaccines dispensed target the large stock with minimal transaction involving the poultry sector. At present, the Department of Animal Health does not regulate this enterprise.

## **5. Legal Framework**

The Department of Animal Health Services is charged with overseeing all the animal health issues in the country. Due to the instability that the country underwent in the past years, there previously have been no effective regulations in place to support the department's activities. The following policy and legal documents have now been approved by Parliament and provide a legal framework under which the department operates:

- The Veterinary Code
- Livestock Policy Document
- Master Plan Document for Ministry of Livestock
- Human Resources Assessment Report

## **6. Epidemio-Surveillance System (Surveillance and Reporting)**

Currently there is a disease surveillance system in place but it needs strengthening so that it can detect at an early stage any outbreak of CBPP.

### **Passive Surveillance**

CBPP, being one of the OIE listed diseases is a Notifiable disease and reporting is prescribed under the Veterinary Code. Passive surveillance (monthly livestock passive disease reports) is currently being conducted by public and private focal points, livestock professionals' associations and SAHSP officers. District focal points collect all disease reports and submit these to the Director of Animal Health Services. Berbera port is manned by animal health personnel who carry out inspection and certification of livestock for export. No other border point is manned. The DAH has now been mandated to report to the OIE and the AU-IBAR.

This system relies on a weak network of personnel who are positioned on the ground and therefore is likely to under report on the disease situation as well as be subject to delays. To overcome this, use of available telephone technology needs to be looked at as an opportunity, which needs further exploration.

Contracts or other forms of agreements with existing network providers can allow for speedy disease reporting including access to toll free calling services.

Livestock owners have a critical role to play in reporting of disease incidents. They are always with their animals and are therefore best placed to detect any signs of ill health in them. There is a need to carry out sensitization and create awareness of priority diseases among livestock owners and frontline animal health service providers so that they can quickly pick up any disease outbreak at an early stage and report to the relevant officials. To be included in these trainings will be personnel manning ports and border entry points including customs and security, focal points for NGOs, local government personnel, law and order maintaining agencies.

GIS compatible formats for reporting Notifiable diseases will be developed and the personnel trained to use them. Emergency reporting telephone lines will be established at regional and headquarter levels and communities will be encouraged to use these facilities.

Disease reporting is compulsory as stipulated by the Veterinary Code, Chapter 2.1, Notifications, *Article 2.1.1, part 3* which states as follows:

- 3) Any veterinarian, animal health assistant or of other professional category (e.g. pharmacist, zoo technician, CBAHW) who has reason to believe or suspect the occurrence of a transmissible disease shall forthwith give information thereof to the nearest most senior veterinary authority or officer.*
- 4) Reporting to the most senior veterinary authority or officer in the same district or in the adjoining district, whether or not such district is in the same regional jurisdiction or not, and reporting to the Director of Veterinary Services shall be at the intervals (e.g. daily, weekly, monthly, annually) and in the manner and format specified by the Veterinary Administration through Ministerial Decrees.*
- 5) Notification and reporting at all levels should be within 24 hours.*

## **Active Surveillance**

The only active surveys that have been carried out so far for TADs in the recent years have been organized and financed by NGOs working in the livestock sector within Somaliland. The NGOs have a pool of professionals who are highly trained in active surveillance for the major TADS including Rinderpest. They will be used for structured targeted surveillance, Participatory Disease Search, clinical and serological surveys in high-risk areas. Training and updating of these personnel on CBPP and risk analysis will be carried out to enhance early detection and reporting of the disease. Active targeted surveys in significant local cattle populations and animals on transit to export ports will be conducted to determine prevalence levels of CBPP.

### **Animal Health Information System**

With the support of SAHSP an Animal Health Information System has been established. However, the system is yet to start operating optimally. The regions are still not reporting fully. There is need for further training on the use of the reporting formats, which have been developed for passive surveillance as well as for outbreak investigation questionnaires to be used during active surveys. These formats should be GIS compatible. A database for receiving, managing and analyzing diagnostic and surveillance data has been set up at Hargeissa office but lacks skilled personnel. In the long term this needs to be linked to the regional offices.

## **7. Principles of CBPP Prevention and Control in Somaliland**

The main measures currently available to prevent, control and eradicate CBPP include:

- Effective disease surveillance (passive and active) for early detection and reporting of outbreaks. This surveillance should be carried out together with abattoir examination of infected lungs.
- Intensive farmer training and awareness campaigns targeting other stakeholders in the livestock industry while using media that are easily understood, highly visual, and that will serve as a constant reminder of the disease and its

importance should be conducted. Lines of communication must be established between livestock owners and the veterinary services, using local authorities and animal health service providers as intermediaries when necessary, who should also be informed about CBPP. This would also ensure the communities cooperation when surveillance and control activities are being conducted.

- Movement control of cattle moving for trade including quarantine for animals coming from neighboring countries
- Vaccination of the local cattle population
- Testing followed by rapid, slaughter of infected cattle and cattle at high risk of infection.

Due to the insidious nature of the disease a regional approach to the control of CBPP would yield the most effective results. This should include harmonized surveillance, vaccination and movement controls.

It is, however, the unofficial entry of cattle across national borders that presents the greatest risks and is the most difficult to deal with in respect to preventing the entry of CBPP. Such unofficial entry may occur through trading or nomadic or transhumance practices. The sudden influx of refugees with their cattle from neighboring, infected, countries where there is civil strife can constitute the greatest of all disease entry risks.

Whilst it may be very difficult or even counterproductive to try to prevent such unofficial cattle entries, every effort will be made to make them safer by trying to ensure that only laboratory-tested healthy or vaccinated cattle cross at approved entry points. This will entail developing a close working relationship with animal health authorities in neighbouring countries, both at the national level and at local levels in provinces adjacent to borders. It also entails developing a close relationship with cattle traders and cattle keeping communities and herders in high-risk border areas. This is to help to ensure that there is early warning of any known or suspect CBPP activity near the border; that cattle are obtained as far as practicable from CBPP-free areas and are healthy and vaccinated against CBPP; and that any cattle that are sick are held apart from other cattle (i.e. self quarantine) and brought to the attention of local animal health staff as soon as

possible.

A combination of the above risk reduction measures will be carried out in an effort to prevent the incursion of CBPP and to control and eventually eradicate it if it occurs.

## **8. Early warning Systems**

In order to be able to detect an incursion of CBPP into the country at the earliest possible moment the following will be implemented:

- Disease reporting from the level of the livestock owner to the animal health service provider will be strengthened. Good farmer and public awareness programmes for CBPP and other high-threat epidemic livestock diseases will be carried out to improve the veterinary-farmer interface;
- Training of field veterinary officers, veterinary auxiliary staff, local authorities and cattle owners in the clinical and gross pathological recognition of CBPP and other serious epidemic livestock diseases will be carried out; the training will include collection and transportation of diagnostic specimens; while stressing on the need for prompt action;
- Sustained active disease surveillance, to supplement passive monitoring, based on close coordination between cattle owners, field, laboratory and epidemiology veterinary services, and use of techniques such as participatory questionnaires, serological surveys and abattoir monitoring to supplement field searching for clinical disease;
- Participatory epidemiology techniques have been used successfully in the eradication of rinderpest disease in the three countries of Somalia, Ethiopia and Kenya. These methods will be used to assess the relative incidences of diseases including CBPP within the community. At the same time it is expected that they will provide useful information on the importance of these diseases to the owners in terms of lost production and real wealth in the absence of validated numerical data. These techniques are able to provide comparative impact assessments and therefore will be standardized for valid comparisons with other populations and results could always be checked by conventional

methods. Unlike conventional epidemiology that is commodity based and thus is an outsider's view, participatory epidemiology provides us with an insider's view that includes private and sensitive information from livestock owners not accessible otherwise.

- Emergency disease reporting mechanisms will be strengthened to speed up the reporting by the livestock owners to the appropriate animal health service providers and to regional and national veterinary headquarters as appropriate;
- enhancement of laboratory diagnostic capabilities for CBPP at Hargeissa and Berbera; Mobile field testing units will be set up within regional and national veterinary laboratories;
- Strong linkages between national laboratories and regional laboratories e.g. KARI Muguga, CVL Kabete and other world reference laboratories will be developed.
- The national epidemiological capabilities will be strengthened to support emergency preparedness and disease management strategies; and

### **Farmer Awareness and Education Programmes**

Communication based upon awareness creation and education programmes will aim at fostering ownership and support among livestock owners and other stakeholders to participate in disease prevention and in the event of an outbreak, in the control and eradication measures to be instituted.

Communication is an indispensable tool in disease control as it makes the general target groups aware of the nature and potential consequences of the disease and of the benefits to be derived from its prevention and eradication. Accurate, timely and consistent communication is vital for the prevention and containment of CBPP. In order to achieve this, a survey to assess the knowledge, attitudes and practices of the population needs to be carried out. This would be used to set up a communication strategy.

Communication channels to be used include:

- Radio programmes - local FM radios, BBC Somali service,
- Posters and leaflets,
- Mosques - speeches at prayer time especially on Fridays,

- Public loudspeakers mounted on vehicles,
- Primary schools teachers,
- MHC centers,
- Public gatherings – use of skits, audio-visual video programmes and poems.

The Somali society is largely a verbal society and written messages are unlikely to have an impact upon the rural communities.

Some of the **key messages** for risk and behavior communication that need to be communicated to the public and animal health workers are:

- It is essential to notify and seek help from the nearest government animal health official as soon as an unusual disease outbreak is seen in cattle
- Signs of CBPP
- Control measures to be instituted and the need to cooperate

### **Case definition of CBPP**

A herd having several heads of cattle showing some or all of the following signs should be treated as highly suspicious for CBPP:

- acute or chronic coughing, especially after exercise;
- loss of weight;
- fast, difficult and noisy breathing/dyspnoea and;
- discharge from the nose;

**The presence of a sufficient number of concurrent symptoms will lead to establishment of the suspicion and subsequent sampling and use of the CFT.**

The following sequence of activities will be followed in carrying out surveillance of a possible CBPP outbreak:

- Suspicion
- Confirmation of a suspicion

- Pre-diagnosis
- Confirmed diagnosis
- Confirmation of suspicion will be done on clinical diagnosis using the case definition. The slide agglutination test is simple to perform and could be used as a pen-side test. It is more sensitive in the early stages of the disease, but it lacks specificity.

### **Specific surveillance procedures for CBPP**

The Department of Animal Health Services and key NGOs operating in Somaliland have been developing the capacity to carry out active surveillance against priority diseases such as rinderpest, RVF and PPR.

### **Abattoir monitoring**

Abattoir monitoring is a cheap and highly effective method of surveillance for CBPP. The coverage that can be provided depends on the proportion of cattle in the country that are slaughtered in controlled abattoirs with meat inspection facilities. Meat inspection staff will be trained in correct methods for palpating, sectioning and examining pleura and lungs during inspection of cattle carcasses. They will receive special training in the key pathological features of CBPP, and will be provided with forms on which they may record their findings. Informal slaughter sites will also be monitored.

#### **Key Indicators of CBPP in Meat Inspection**

- yellow fluid in the chest cavity
- lungs covered with yellowish material
- lungs adhering to the chest wall
- lungs which do not collapse and are solid or marbled
- sequestra in the lungs of chronic cases

Diagnostic samples will be collected from suspect lungs, and meat inspectors will be trained in how to do this. They will also be provided with collection kits. Trace

back will be carried out whenever suspect cases are encountered to identify the origins of the suspect animals. Once the origins are identified herds at these points will be sampled for further laboratory tests.

### **Clinical surveillance**

Both active and passive clinical surveillance are also valuable for the early detection of CBPP. Passive clinical surveillance will be encouraged through a comprehensive national programme to the extent that everyone who comes into contact with cattle from field veterinarians, to animal health assistants, farmers, traders and down to animal attendants will be encouraged to look out for the key clinical signs of CBPP and to report any suspect cases

Simple pictorial booklets on CBPP, in appropriate languages, should be widely distributed.

#### **Key signs to look out for in clinical surveillance for CBPP**

- fast, difficult or noisy breathing
- discharges from the nose
- coughing, especially after exercise
- anorexia, debility, weakness and loss of weight

Surveillance will follow OIE surveillance standards for CBPP, particularly in the context of defining CBPP-free zones and countries.

### **Laboratory diagnosis**

Definitive diagnosis based on isolation and identification of the causative agent and/or the finding of specific antigens or antibodies by appropriate serological tests will be carried out at laboratories in Hargeissa and Berbera. Where the appropriate tests can not be conducted samples will be sent to laboratories in neighbouring countries for further analysis.

Several methods for laboratory diagnosis of CBPP are available and depending on

the capacity of the laboratory the following tests will be used:

- Culture and identification of MmmSC
- Antigen detection tests
  - Agar gel diffusion tests
  - Indirect fluorescent antibody test
  - Immunohistochemistry.
- Antibody detection tests
  - Complement fixation (microtitre method) (CFT)
  - The competitive enzyme linked immunosorbent assay (c-ELISA)
  - The immunoblotting (IBT) test

To confirm new outbreaks isolation and identification of the infectious agent must be performed. None of the serological tests on its own is sufficient as a single diagnostic test but better results can be obtained if serum samples from several animals are collected and tested with the CFT and the competitive ELISA to obtain a diagnosis on herd basis.

The immunoblotting (IBT) test is highly specific and should be introduced as a confirmatory test at critical phases of CBPP control programmes. The CFT and IBT have been performed serially on all sera for CBPP surveillance to ensure that an accurate diagnosis is arrived at.

## **9. Early Reaction contingency planning**

At present there is no evidence that CBPP is present in the cattle herds within Somaliland but reports from neighbouring countries do indicate that the disease is endemic in certain zones within these countries. Somaliland serves as a transit route for cattle en-route to the Middle East for export from neighbouring countries and therefore is at high risk of an incursion of TADs including CBPP. In the event that there is an incursion into the country by the disease, every effort will be directed at rapid containment of the disease to the primary focus or zone of infection, and eradication within the shortest possible time to avoid spread and possible progression to endemic status.

**Epidemiological features to be considered in carrying out a CBPP**

## **eradication strategy**

In devising eradication strategies a number of epidemiological factors have been considered and these include:

- no domestic livestock species other than cattle are susceptible to CBPP; humans are not susceptible;
- there are no wildlife reservoirs of infection;
- *MmmSC* is closely related to other mycoplasmas in the 'mycoplasma cluster,' complicating its identification;
- CBPP is transmitted by close direct contact between animals, and thus movement of infected cattle and congregation of animals is the key factor in its spread;
- the causal organism survives poorly in the environment and therefore indirect spread of infection, e.g. by fomites, is unimportant;
- epidemics in new areas sometimes evolve slowly, making early detection difficult;
- cattle that survive CBPP infection are likely to become chronic carriers, with sequestered lesions in their lungs. A proportion of these are sero-negative. Sequestra may break down, particularly when cattle are stressed, and these animals again become active spreaders of infection;
- vaccines that are available are far from perfect. Nevertheless, vaccination campaigns, if comprehensively and consistently applied, are a valuable component of control and eradication campaigns; and
- the use of antibiotics, whilst ameliorating clinical signs in acute cases, may complicate eradication programmes, with the possible creation of chronic carriers of the disease.

Some of these factors, particularly the presence of chronic carriers and problems in disease surveillance, make CBPP one of the more difficult transboundary animal diseases to eradicate.

## **Strategies for CBPP eradication**

Taking account of the above epidemiological and other factors, three broad strategies for the control and eradication of CBPP will be applied in the event of an

incursion, namely:

- reduction of the number of infected and potentially infected animals in cattle populations through stamping-out campaigns;
- reduction of the rate of direct contact between infected and susceptible cattle through surveillance programmes, zonation, quarantine and strict movement controls; and
- reduction of the number of susceptible animals in target populations through comprehensive vaccination campaigns.

### **Response to an outbreak in Somaliland**

In the event that a diagnosis using field CFT shows a positive result for CBPP the DAH will issue instructions on measures to be instituted immediately to contain the outbreak. These powers are conferred upon him by *Article 2.2.1* of the Veterinary Code as listed below:

*The Veterinary Administration may, by decree, declare the following zones for disease control purposes along OIE guidelines:*

- a) A disease free zone*
- b) A surveillance zone separating an infected area from the remainder of the country.*
- c) A buffer zone where animals are systematically vaccinated for the protection of a disease free zone.*
- d) An infected zone where the disease is present, when the remainder of the country is free from the diseases.*

*2) For an infected zone:*

- a) The Veterinary Administration shall extend, diminish or otherwise alter the limit of the zone declared to be infected.*
- b) The zone shall be considered to be infected for a particular disease as such until a period exceeding the infective period specified in the OIE has elapsed after the last reported case, and when full prophylactic and appropriate animal health measures to be determined by the Veterinary*

*Administration have been applied to prevent possible reappearance or spread of the disease.*

- c) *Movement of susceptible livestock out of the infected zone into the disease free parts of the country shall be strictly controlled and any of the following measures may be considered:*
- *No live animal may leave the zone, or;*
  - *Animals can be moved by mechanical transport to a special abattoir located in the surveillance zone for immediate slaughter, or;*
  - *Exceptionally, live animals can enter the surveillance zone under suitable controls established by the Veterinary Administration; Freedom from infection of these animals must be confirmed by appropriate tests before entering the zone.*
  - *Live animals can leave the infected zone if the epidemiological conditions are such that disease transmission cannot occur.*

In order to ensure compliance, the village elders will play a vital role in educating the community on the need for compliance. Communication through the use of radio messages would also promote awareness in the population on recommended bio-security measures.

### **Chain of command**

The Veterinary Code stipulates the chain of command with regard to the delivery of animal health services within the country. **Chapter 4.1, Article 4.1.1** states as follows:

- a) *The Veterinary Administration shall include the Minister, the Director General, the Director of Veterinary Services and field level veterinary authorities and veterinary professionals.*
- b) *A statutory body, the National Veterinary Board, independent of the National Veterinary Service, shall collaborate with the Veterinary Administration to cater for the efficient, effective and smooth functioning of the veterinary profession.*
- c) *The Minister is the highest authority of the Veterinary Administration and is responsible for the overall national veterinary service and related functions.*

*d) The Minister may, by decree, delegate any of the powers or functions assigned to him/her under this Code to the Director General, Director of Veterinary Services or Heads of Veterinary Authorities, or other autonomous agencies or institutions established to perform specific veterinary functions and roles.*

In June 2008 a National Emergency Preparedness and Response Planning Committee made up of key players in the Animal Health Service delivery within the country was formed.

### **National Emergency Preparedness and Response Planning Committee**

It is made up of:

- The Director of Veterinary Services,
- Officer in charge of the Epidemiology and Data Management Unit (EDMU),
- Representative of the Somaliland National Veterinary Association (SOLNAVA),
- Representative of the United Livestock Professional Association (ULPA),
- Representative of the National Environmental Research and Disaster Preparedness (NERAD),
- Representative of the Local Government,
- Ministry of Health,
- VetAid,
- Food and Agriculture Organization of the United Nations,
- Somali Animal Health Services Project (SAHSP),
- Pastoral Environment Network in the Horn of Africa (PENHA).

The terms of reference of the National Emergency Preparedness and Response Planning Committee include:

- Enhancement of the capabilities of field and laboratory veterinary services, especially for specific high priority livestock disease emergencies,
- Development of active disease surveillance and epidemiological analysis capabilities and of emergency reporting systems,
- Staff training and farmer awareness programmes,
- Assessment of resource needs and planning for their provision during animal

health emergencies,

- Drafting of legislation and development of financial plans,
- Implementation of simulation exercises to test and modify animal health emergency plans and preparedness,
- Appointment of drafting teams for the preparation, monitoring and approval of contingency plans and other documents,
- Liaison with and involvement of relevant persons and organizations outside the government animal health services,
- Overall monitoring of the national state of preparedness for animal health emergencies.

Upon receiving confirmation of CBPP incursion the Director of Animal Health Services shall immediately convene the Crisis Management Technical Team.

### **The Crisis Management Technical Team (CMTT)**

The CMTT will comprise of the following:

- Director of Animal Health Services (Chairman),
- Director of Health,
- Epidemiologist/AI Expert- EDMU (Secretary),
- All Regional Coordinators,
- Representatives of Professional Associations,
- Representative of NGOs,
- Representatives of ministries of Interior, Transport and Local Government,
- Technical experts co-opted on an ad hoc basis,
- Ministry of Information representative.

The CMTT is charged with coordinating the emergency response and advising the National Emergency Preparedness and Response Planning Committee through the DAHS on the extent of the problem and the requirements of the response in terms of finance, personnel (non- departmental) and materials.

The CMTT shall mobilize the Rapid Response Teams to travel to the outbreak area.

At the same time, the CMTT shall mobilize the local response team including the area DVO, MoH, local authority, local police boss and the animal service providers to travel to the outbreak area. The national and local rapid response teams will operate under the direction of the CMTT to implement disease control measures according to the standard operating guidelines of the RRT (See accompanying document on RRP).

When issuing instructions to carry out control measures the Director will be using the powers conferred upon him by Article 4.2.2 of the Veterinary Code, which states as follows:

*The Director of Veterinary Services may issue instructions, following approval by the Director General, to any veterinary authority, veterinary officer or inspector or any veterinarian (both public and private) on all or any of the following matters:*

- a) Requiring the concerned to furnish such information as the Director may think fit concerning any animal disease existing, or suspected to exist in the zone, and specially the manner in which such information shall be given.*
- b) Ensuring effective compliance with any measures, which the director thinks necessary for the prevention and control of contagious diseases.*
- c) Carrying out any other instructions within his/her competence and deemed necessary for the purpose of disease control and regulations issued by the Veterinary Administration.*

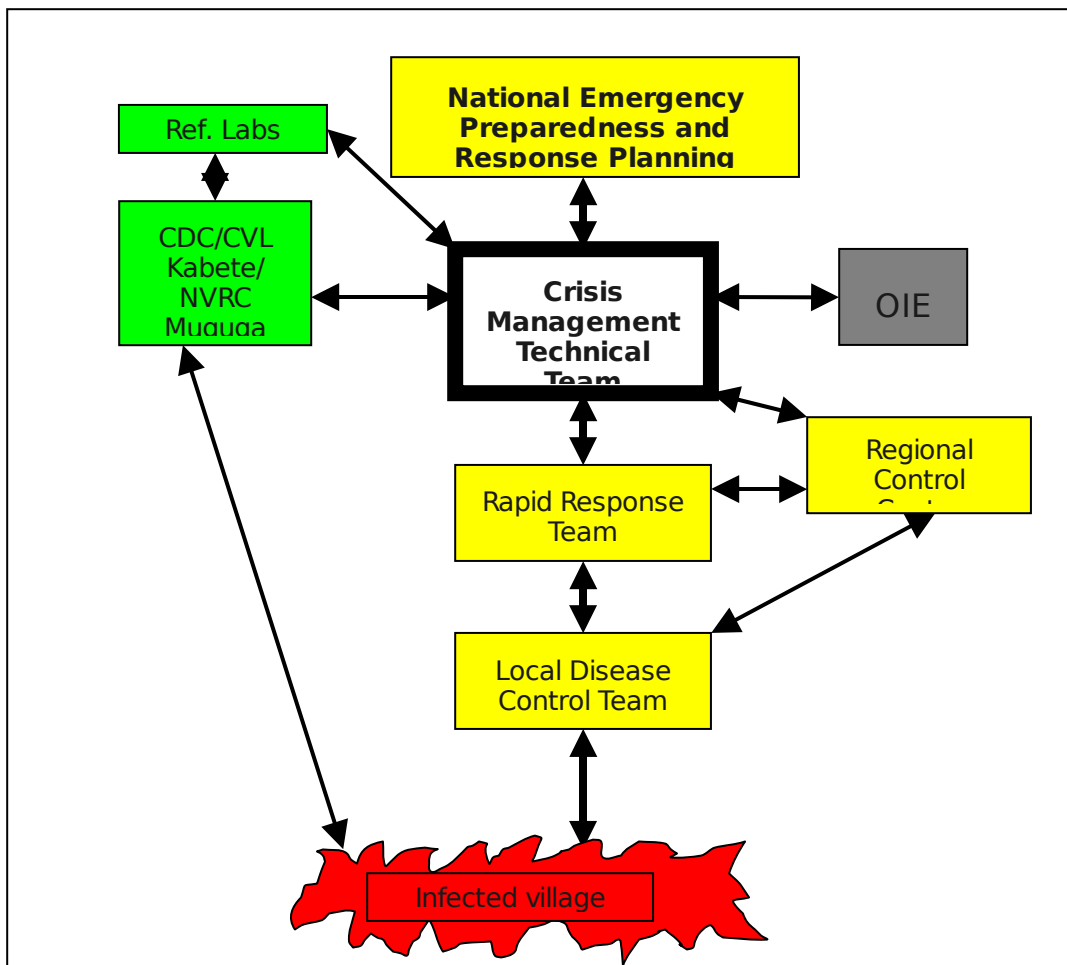
The CMTT shall also mobilize available resources from the various organizations making up its membership. This would include personnel previously identified as prospective members of RRTs and trained as well as vehicles and materials.

The Department of Animal Health of Somaliland has inadequate capacity to undertake disease surveillance, investigate and respond to widespread outbreaks of HPAI. The DAHS will therefore seek assistance from other government bodies, NGOs and the international community in case of widespread outbreaks of HPAI. The veterinary services will have overall leadership role of the disease control actions and responsibility. The DAHS will also work within the framework of the

National Emergency Preparedness and Response Planning Committee. The emergency operations during a disease outbreak can only be carried out effectively when the following are in place:

- Adequate physical, financial and human resources be in place and where the department is deficient alternative support will be sourced from the private sector,
- The establishment of an Emergency Fund for the prevention and control of emerging zoonotic infectious diseases.

## **Command structure in the event of an outbreak**



### **Composition of Rapid Response Teams (RRTs)**

Animal health service delivery in Somaliland suffered greatly during the years of instability that the country underwent. As result, the Department of Animal Health Services lost most of its resources, both human and material, and its infrastructure was almost totally destroyed. However, it retains personnel at headquarter, regional and district levels. The government employs 22 veterinarians and 60 veterinary assistants. The private sector, including NGOs has had to move in to fill this void and in the process several professional bodies and organizations have been set up with a membership totalling 53 veterinarians and 158 veterinary assistants.

It is envisaged that Rapid Response Teams (RRTs) will be formed from this pool of animal health service providers, both public and private, and they will undergo

training before being deployed at regional level. A total of eight (8) teams, two at headquarters and one per region will be formed.

Memoranda of understanding will be signed between the DAHS and the professional organizations on the operations of these teams. Training and simulation exercises will be carried out using consultancies.

Non-health technical expertise and manpower will be necessary for pertinent activities like culling, disposal, quarantine enforcement and maintenance of public order. Through the National Emergency Task Force committee a framework of cooperation between the Ministries of Health, Local Government, Interior and Transport will be developed. It will spell out the specific roles to be undertaken by each ministry in the event of an emergency and will form the background for simulation exercises to be carried out.

### **Quarantine and Movement Controls**

If CBPP is detected the first step to be taken will be to immediately quarantine the known affected administrative regions to prevent the movement of potentially infected cattle from these areas. An urgent epidemiological assessment is then undertaken to make an initial estimate of the likely spread of infection that has taken place. This would be based not only on the sites of known disease occurrence, but also on movements of cattle to and from these sites and on opportunities that have occurred for mingling of infected and susceptible cattle. Based on this initial assessment, three zones would be declared: infected zones; surveillance zones; and CBPP-free zones.

### **Slaughter of Infected and Potentially cattle - Stamping Out**

A stamping-out programme for CBPP involves the destruction of all infected and potentially infected cattle in well-defined infected areas, combined with very strict movement controls to ensure that cattle cannot leave the target areas before undergoing testing .

As the causative organism, *MmmSC*, is not transmitted in meat, consideration will

be given to salvaging meat by allowing clinically healthy but CBPP positive cattle to be transported for immediate abattoir slaughter, providing this is done in controlled abattoirs with meat inspection within the infected area. The owners would therefore be able to recover at least part of the costs of raising their animals.

In order to have a successful CBPP stamping-out campaign the following are essential prerequisites

- Political and community support
- Well-defined infected area(s) based on comprehensive surveillance programmes
- Capabilities to seal off infected areas through quarantine and livestock movement controls
- Well-trained personnel and availability of necessary financial and physical resources
- Provision for fair and timely compensation for slaughtered cattle
- Legal powers
- Rehabilitation programmes for affected farming communities
- Assistance from security agents

### Vaccination programmes

Vaccination programmes as components of a CBPP eradication campaign will be comprehensively and consistently applied until there is evidence from disease surveillance that the disease has either apparently disappeared or at least the incidence has fallen to an extremely low level. The target areas for vaccination will include all but proven CBPP-free zones. If the disease becomes endemic in certain regions, countrywide programmes will be undertaken.

Live, attenuated CBPP vaccines (T<sub>1</sub>-44) will be used. The vaccine will be procured from reliable manufacturers (i.e. those with external quality assurance certification) who adhere to internationally recognized standards of good manufacturing practice and quality assurance for vaccine seed management, viable mycoplasma titre, purity, safety and potency. The vaccine is freeze-dried vaccine and therefore it will be essential that adequate cold-chain facilities are maintained at central and local vaccine storage depots, and from there to the points of injection in

the field.

During the initial stages (first year or two) of the vaccination campaign, cattle will be vaccinated at intervals of 4 to 6 months. Thereafter, annual vaccination will be carried out. Vaccination will be systematically applied to target cattle populations with as close as possible to 100% coverage for a minimum of 5 years until the disease can no longer be detected by surveillance (e.g. clinical, abattoir, serological).

T<sub>1</sub>-44 vaccine is prone to causing excessive local reactions in vaccinated animals although not so severely in the local *Bos indicus* breed. These may take the form of severe local reactions, and very occasional systemic reactions and even death. Attention will be applied to correct vaccination technique to minimize these reactions. CBPP vaccines will be injected subcutaneously (not intramuscularly, intradermally or into fascial sheets). The preferred site is in the tail.

Vaccinated cattle will be identified by branding or ear notching.

### **The final stages of an eradication campaign against CBPP incursion and Proof of Freedom**

Having eradicated any CBPP disease incursion, Somaliland will aim at maintaining strategic vaccination in high-risk areas where there the threat of a new incursion of the disease, such as from a neighbouring country is high. Such areas will include a buffer zone along the borders and areas adjacent to the main livestock trade routes. Resources will be directed away from routine vaccination toward increased activities focusing on early warning and early response. Active disease surveillance activities will be enhanced to maintain a high level of preparedness against the disease. In this way, any disease breakdowns can be detected and eliminated quickly.

## **Annex 1: Zonation of infected areas**

Based on this initial epidemiological assessment, three zones would be declared: infected zones; surveillance zones; and CBPP-free zones.

### **Infected zone(s)**

The infected zone encompasses the area immediately surrounding one or more infected farms, premises or villages. Whilst its size and shape is influenced by topographical features, physical barriers, administrative borders, transhumance, livestock movement patterns and epidemiological considerations, OIE recommends in general that infected zones should be at least a 50 km radius in areas where extensive livestock raising is practiced.

In the initial stages of an outbreak, when its extent is not well known, larger infected zones will be declared, and then progressively reduced in size as active disease surveillance reveals the true extent of the outbreak.

A complete ban on the movement of cattle out of the infected zone will be put in place, and this should be rigorously enforced.

The chosen disease control strategy, whether it is stamping out, vaccination or a combination of these, will be instituted.

### **Surveillance (or control) zone(s)**

This zone will be much larger, and will surround one or more infected zones. These zones will also include the areas adjacent to the movement routes for trade animals and along the countries borders. It may cover a whole Province or administrative region, and, in many cases, the whole country. In this zone, the most intensive disease surveillance will be carried out. Cattle will not be allowed to move out of this zone unless they are moving directly under supervision to abattoirs for slaughter or are shown by testing to be free of infection.

### **CBPP-free zone(s)**

This encompasses the rest of the country. However, because of the potential of CBPP for wide dissemination, it would be unwise to regard any part of a country in the throes of a virgin outbreak as unworthy of a high level of surveillance. The emphasis in free zones should be on strict quarantine measures to prevent entry of the disease from infected zones, coupled with continuing surveillance to provide confidence of continuing freedom.

These zones should be subjected to the same degree of information dissemination as the zones in which the outbreak occurs. This should be extended, through good and rapid communication, to neighbouring countries.

Comprehensive disease surveillance programmes will be put into place throughout the country, and the zones will be progressively adjusted according to findings.

## **ANNEX 2: Surveillance and testing strategies (serological) for CBPP in different disease situations**

### ***Confirmation of outbreak***

The cELISA and the CFT detect antibodies to MmmSC at different stages of infection and no test can detect all infected animals and these tests, when used separately, cannot detect every infected animal with antibodies. The relative sensitivity of the two tests is between 50% and 80%. For the confirmation of an outbreak it may therefore be necessary to use both tests.

In an outbreak it is recommended to collect sera from 15 animals that have been clinically affected. In the case of an outbreak of CBPP many sera will be positive and the titres will be high. The influence of antibiotic treatments on the performance of the serological tests has not been assessed and should be investigated.

It is essential that isolation and identification of MmmSC be carried out in new outbreaks and the strains should be forwarded to the reference laboratory for identification.

### ***Prevalence studies in endemic areas (by serology)***

The purpose of prevalence studies is to determine the proportion and distribution of infected herds. For estimation of sero-prevalence, CFT and c-ELISA tests will be used and in line with recommendations of OIE (OIE, 2000), any herd will be designated positive if one or more animals react positive in at least one of the two tests (parallel interpretation). Because sensitivity and specificity of the tests in parallel interpretation are not known, a test evaluation will be conducted.

The results of both tests can be influenced during the first four months by vaccinations therefore samples should be collected at least four months after the last vaccination. Prevalence studies should be primarily based on cross sectional serological studies.

Samples collected in connection with the serosurveillance of rinderpest during the PACE programme and on the existing serum banks will be analysed for antibody prevalence.

CBPP specific sampling frames will be developed for future surveys.

Both serological tests (cELISA, CFT) are recommended for mass screening but the cELISA can be better quality controlled and appears to be more suitable.

### ***Disease detection in endemic areas***

Serological surveillance will be used to support abattoir and clinical surveillance in the event that the disease becomes endemic in certain parts of the country. Although serology can be used to direct further clinical investigations it is not sufficient on its own to identify all herds with active disease.

Serology will therefore be used to identify priorities for further clinical and outbreak investigations (see under outbreak investigations). These priority areas include the following:

1. Herds from areas which had been classified as positive by the CFT and the cELISA and areas where clinical reports of CBPP exist.
2. Herds from areas which were identified by CFT with high titres
3. Herds from areas which were identified by cELISA with high titres

### ***Disease detection in buffer zones***

Intensive vaccination in diseased areas of buffer zones might influence the reliability of positive serological results by cELISA and CFT despite the high specificity of the two tests in disease free areas. When interpreting the serological results it is important to consider the time of the last vaccination since both tests will detect some vaccinated animals up to 4 months.

### ***Disease detection in surveillance zones***

Abattoir, clinical and serological surveillance will be carried out in disease-free zones. The early detection and confirmation of disease is of highest importance. The sensitivity of serological detection will be maximized by using the CFT and the cELISA in parallel.

### **Clinical surveillance**

The success of clinical surveillance relies on the ability of the veterinary services, cattle owners and other stakeholders to correctly identify suspect cases of CBPP. Considerable efforts will be directed towards the enhancement of awareness of CBPP and it is recommended that continued training in disease recognition and sample taking be provided. To facilitate disease recognition and reporting a case definition for CBPP has been developed and applied. Disease reporting of all suspect cases and laboratory confirmation is critical.

### **Surveillance at the abattoir**

Clinical and abattoir surveillance for suspect and pathognomonic lesions is expected to identify the majority of new outbreaks. Serological studies will be used to identify the infected herds of origin.

Lung samples and pleural fluids should be submitted to the laboratory when CBPP is suspected. Mycoplasma isolation and where available PCR will be used to confirm the diagnosis.

### ***Importation in disease free zones***

Importation will be done only from other disease free zones in order to prevent the re-introduction of the disease. Quarantine facilities will be established and animals will be kept here and tested before being allowed to enter the disease free zone (for the surveillance of any disease and not only CBPP). Both the CFT and the cELISA tests will be used on these animals. It is also recommended that such animals originate only from a herd which has been tested and shown to be clear of CBPP.

### ***Monitoring of vaccinations***

Monitoring of CBPP vaccination campaigns is needed to assess the effectiveness and coverage of the vaccinations.

Possible strategies are:

- Branding of vaccinated cattle by brands identifying the time of vaccination and monitoring of the proportion of cattle branded.
- Monitoring the reduction of clinical disease incidence.
- Monitoring the reduction of serological prevalence.
- Direct serological monitoring of vaccine marker (not available at present).
- Serological monitoring on MmmSC antibodies induced by vaccination (no reliable test available at present).

The monitoring should be carried out following agreed sampling frames.

### ***Responsibilities***

All diagnoses must be confirmed by the country's Central Diagnostic Laboratory. Appropriate samples for CBPP diagnosis (serum, lung, lymph nodes, pleural fluid) will be sent in appropriate containers under suitable transport conditions by the fastest means to the national laboratories. Samples from outbreaks will be sent to the international reference laboratories for further confirmation.

Results of diagnostic tests in CBPP will be reported without delay to the Director of Veterinary Services for early response to CBPP outbreaks. All reports especially disease confirmation from reference laboratories will be reported to the OIE and neighbouring countries.

## References

1. William A. Geering, William Amanfu. *Preparation of Contagious Bovine Pleuropneumonia Contingency Plans. FAO Manual No. 14 (2002)*
2. Final Research Co-ordination Meeting of the FAO/IAEA Coordinated Research Programme on the “*Monitoring of Contagious Bovine Pleuropneumonia in Africa Using Enzyme Immunoassays*” 21 February, 2003, Bamako, Mali