



SOMALILAND

CONTAGIOUS CAPRINE

PLEUROPNEUMONIA

CONTINGENCY

PLAN

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## 1. NATURE OF THE DISEASE

### 1.1 Definition

Contagious Caprine Pleuropneumonia (CCPP) is a highly contagious and severe respiratory disease of goats that is caused by *Mycoplasma capricolum* subspecies . *capripneumoniae* (Mccp) ; It is a mycoplasmal disease associated with high production losses and mortalities and characterized by fibrinous pneumonia, sero-fibrinous pleuritis and oedema of the interlobar septa of the lungs.

### 1.2 Geographic Distribution

The clinical disease has been reported in at least 30 countries mainly in Africa and Asia (Thiaucourt and Bålske, 1996) but the isolation has only been confirmed in Chad, Eritrea, Ethiopia, Kenya ,Niger, Sudan Tanzania, Tunisia ,and Uganda In Asia and the Mediterranean In Asia isolations have been reported in Oman ,Turkey ,the United Arab Emirates, and Yemen. CCPP was also reported in mainland Europe in 2004, where outbreaks were confirmed in Thrace, Turkey. The precise distribution of the disease is not known and it may be much more widespread than is documented as it is often confused with other respiratory infections and also because of challenges faced in the isolation of the causative organism

### 1.3 Aetiology

Contagious Caprine Pleuropneumonia (CCPP) is caused by *Mycoplasma Capricolum* subsp. *capripneumoniae* (Mccp) It is closely related to *Mycoplasma mycoides* subsp. *mycoides* Large Colonies (MmmLc), *Mycoplasma mycoides* subsp. *capri* (Mmc) and *Mycoplasma capricolum* subsp. *capricolum* (Mcca). Differences do exist between Mccp and other Mycoplasmas. Mccp gross pathological lesions are only confined to the thoracic cavity whereas lesions caused by the latter three may be found in other organs. Histopathologically, Mccp has a branching filamentous morphology *in vivo* whereas other Mycoplasmas show a short filamentous or coccobacillary morphology. *Mycoplasma capricolum* subsp. *capripneumoniae* grows very poorly *in vitro* making it a long and difficult process to isolate it (Thiaucourt et al., 1996). Its growth is more often overshadowed by other Mycoplasmas contaminants in the lung tissues which generally grow faster. The use of antibiotics therapy impairs the cultivation of these mycoplasmas from clinical material.

## **1.4 Epidemiological Features**

### **1.4.1 Susceptible species**

CCPP is reported to affect only goats (Thiaucourt and Bålske, 1996) although there has been evidence of the infection in sheep and cattle. Clinical disease and sero-positivity have been reported in sheep in contact with affected goats. Isolation of *M. capricolum* subsp. *capripneumoniae* from healthy sheep that had been in contact with goat herds affected by CCPP in Kenya were described by Litamoi et al., in 1990. The isolation of *M. capricolum* subsp. *capripneumoniae* from cattle with mastitis has also been reported (Kumar and Garg, 1991).

The disease has also been shown recently to affect wild ruminants such as the wild goats (*Capra aegagru*), Nubian Ibex (*Capra ibex Nubian*) and Laristan Mouflon (*Ovis orientalis laristanica*) and Gerenuk (*Litocranius walleri*).

The disease is not zoonotic

### **1.4.2 Disease Transmission**

Susceptible goats get infected through inhalation of contaminated droplets from infected goats. For the transmission to take place close contact between infected and naive animals is of essence due to the high sensitivity of the mycoplasma to the external environment. Stress factors occasioned by malnutrition and movement over long distances predispose the animals to the disease. The extensive and traditional livestock production system practiced in most African countries enhances the spread of the disease as animals congregate during grazing and watering. Breed and sex appear not to affect the epidemiology of CCPP, but age is an important factor. All age groups are susceptible but mortality is higher among the young.

Chronically infected goats are responsible for perpetuation of the disease in a herd (Thiaucourt and Bålske, 1996; Wesonga et al., 1998). Concurrent infections with viral diseases such as Peste des petits ruminants (PPR) and Capripox (Lefèvre et al., 1987b) predispose lung tissue to invasion by mycoplasmas. The role of sheep as reservoirs of infection is not very clear.

### **2.4.3 Disease patterns**

In areas where CCPP is introduced for the first time into naive populations, acute cases may be observed whereby illness may last for several days. Epidemics may be reported if the herd is fully

susceptible with a morbidity of 100% and mortality of up to 70% (McMartin et al., 1980). In endemic areas, sub acute and chronic cases are common but the symptoms are milder

## 2.5 Clinical Signs

CCPP causes severe respiratory disease in affected goats initially characterized by a high fever ([41-43°C]), high morbidity and mortality rates affecting all ages and both sexes. Other clinical signs that may be noted include lethargy, anorexia and abortions in pregnant goats. After 2-3 days of high fever, the respiratory symptoms become more prominent. This may include: accelerated and labored breathing with painful grunting, frequent, violent and productive cough. In the terminal stages, the animals are unable to move. They stand with their front legs wide apart, the neck is stiff and extended downward, stringy saliva continuously drips from their mouth and mucopurulent discharge obstruct their nostrils. The tongue may protrude and bleat distressingly. Death generally occurs within 7 to 10 days after the onset of the signs, but can be as fast as 2 days. Some animals may have long term infection whereby symptoms are milder but dominated by intermittent cough, nasal discharge and debilitation.



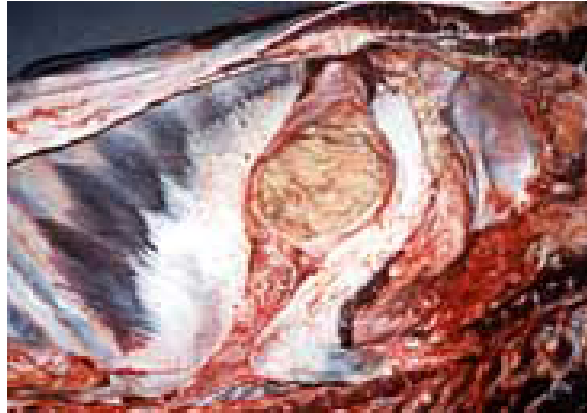
**Fig 1: Goat with nasal discharge.**

## 2.6 Pathology

### 2.6.1 Gross pathology

The gross pathological lesions are localized exclusively to lung and pleura and are often unilateral. There is fibrinous pleuropneumonia with massive lung hepatisation and pleurisy. Affected lungs can be totally hepatized with accumulation of straw-coloured pleural fluid. A lung section shows a fine granular texture with various colours, but usually without any thickening of the interlobular septa.

There is often an abundant pleural exudate and conspicuous pleuritis. The pleural exudates can solidify and form a gelatinous covering sometimes over the whole lung. In acute cases, the pleural cavity contains an excess of straw-coloured fluid with fibrin flocculations. In chronic cases there is a black discolouration of the lung tissue and sequestration of the necrotic lung areas. Adhesions between the lung and the pleura are very common and often very thick.



**Fig 2: Sequestered lungs - typical lesions of chronic CCPP**

### **2.6.2 Histopathology**

Lung tissues in CCPP infected animals may show acute serofibrinous to chronic fibrino-necrotic pleuropneumonia with infiltrates of serofibrinous fluid and inflammatory cells, mainly neutrophils, in the alveoli, bronchioles, interstitial septae and subpleural connective tissue. Intralobular oedema is more prominent but interlobular oedema has also been reported. Peribronchial and peribronchiolar lymphoid hyperplasia with mononuclear cell infiltration may also be present

## **2.7 Diagnosis**

### **2.7.1 Field diagnosis**

It is not possible to establish a CCPP infection in the field based on clinical signs or on postmortem examinations alone. The diagnosis is more complicated where it is endemic. However, high mortality and typical early thoracic lesions in goats during the acute phase are highly indicative of *M. capricolum* subsp *capripneumoniae* infection. All cases of caprine mycoplasmosis need additional laboratory tests to establish a presumptive diagnosis. It may be difficult to distinguish CCPP from an infection by *M. mycoides* subsp *mycoides* LC or *M. mycoides* subsp. *mycoides* SC, which have a pulmonary location. In the case of *M. mycoides* subsp. *mycoides* LC infection, thickening of the interlobular septa may be evident. These lesions are similar to those observed in the case of CBPP. Sometimes the thickening is absent or inconspicuous and laboratory confirmation is needed. Lung

sequestration in goats infected with *M. mycoides* subsp. *mycoides* SC has been described

### **2.7.2 Differential diagnosis**

There are other diseases with similar clinico-pathological syndromes which may be confused with CCPP. These include:

- Peste des Petits Ruminants (PPR) - to which sheep are also susceptible
- Pasteurellosis - which can be differentiated on the basis of distribution of gross lung lesions
- mastitis, arthritis, keratitis, pneumonia and septicaemia syndrome (contagious agalactia syndrome) - the pneumonia is accompanied by prominent lesions in other organs and it does not affect sheep or cattle

### **2.7.3 Laboratory diagnosis**

Various diagnostic tests found in the OIE terrestrial Manual 2008 are highlighted below. Most of these tests do not provide definitive diagnosis. Isolation of Mccp remains the confirmatory test.

#### **Microscopy of lung exudates, impression smears or sections**

Mccp shows a branching filamentous morphology in vivo that can be observed by dark-field microscopy in exudates or tissue suspensions from lesions or pleural fluid. Alternatively, smears made from cut lung lesions can be stained by the method of May-Grünwald-Giesma and examined by light microscopy. The other caprine mycoplasmas show a short filamentous or coccobacillary morphology. Neither of these techniques provides a definitive diagnosis.

#### **Gel precipitin tests to detect antigen in tissue specimens**

Mccp releases an antigenic polysaccharide to which a specific monoclonal antibody (MAb) (WM-25) has been produced. This MAb immunoprecipitates in agar gel with the polysaccharide produced by Mccp, and is used to identify the causative agent in cases of CCPP, particularly when specimens are no longer suitable for culture because of deterioration during transit.

#### **Isolation of mycoplasmas**

##### **Growth, Isolation and Transport Media**

Definite diagnosis is made through culture and isolation of *M. capricolum* subsp. *capripneumoniae* from lung tissue particularly from the interface between consolidated and unconsolidated areas, pleural fluid, and mediastinal lymph nodes. This may be a long and difficult process. The success of isolation depends primarily on the attention that is given to sample collection. Samples should always be kept as cool as possible as viability diminishes rapidly with increasing temperature. After

cloning and purification, isolates are identified by several bio-chemical, immunological and molecular tests.

## Identification of mycoplasmas

### i. Biochemical tests

Only a limited number of biochemical tests perform a useful function as a preliminary screening system and are based on specific enzyme activities or nutritional capabilities. For instance digitonin sensitivity distinguishes mycoplasmas from achleplasmas, and serum digestion differentiates members of the *M. mycoides* cluster from all other small ruminant mycoplasmas. Also phosphatase production separates *M. capricolum* subsp. *capricolum* from other members of the cluster. Substantial metabolic differences between *M. capricolum* subsp. *capricolum* and *M. capricolum* subsp. *capripneumoniae* exist, but differences in glucose metabolism were described between strains of *M. capricolum* subsp. *capripneumoniae*. These tests can not differentiate *M. capricolum* subsp. *capripneumoniae* from all members of *M. mycoides* cluster. The interspecies variation in some biochemical reactions is often considerable, rendering their application valueless

### ii) Growth inhibition test

The growth inhibition (GI) test is the simplest and most specific, but the least sensitive of the tests available. It depends on the direct inhibition of mycoplasma growth on solid media by specific hyperimmune serum and detects primary surface antigens. The GI test is particularly useful in identifying *M. capricolum* subsp. *capripneumoniae* because they appear to be serologically homogeneous. The antiserum to the type strain produces wide inhibition zones free of 'breakthrough' colonies of field isolates from diverse sources. Mccp cross-reacts with Leach's bovine group 7, *M. equigenitalium* and *M. primatum* in the GI test, but since these cross-reactive mycoplasmas do not occur in goats, they present no difficulties when identifying field isolates. However, a small proportion of *M. capricolum* subsp. *capripneumoniae* isolates also cross-react in the GI test with antiserum to *M. capricolum* subsp. *capricolum* which may confuse the identification of field isolates. A monoclonal antibody has been produced which specifically inhibits the growth of *M. capricolum* subsp. *capripneumoniae* but not of other members of the *M. mycoides* cluster It was later demonstrated that this monoclonal antibody was not specific. Cross-reactions with some strains of Bg7 were observed with the GI test and with a strain of *M. capricolum* subsp. *capricolum* in the immunofluorescence test

### iii) **Fluorescent Antibody Test**

The direct and indirect fluorescent antibody tests are one of the most effective, simple and rapid serological methods of identification for most mycoplasma. Several forms have been described, the most commonly used one is the indirect fluorescent antibody (IFA) test which is applied to unfixed colonies on agar.

### iv) **Serological identification**

The complement fixation test (CFT) was used for the detection of CCPP infection and it was found to be more specific, though less sensitive, than the indirect haemagglutination test. The latex agglutination test uses latex beads sensitized with the polysaccharide produced by *M. capricolum* subsp. *capripneumoniae* in culture supernatant in a slide agglutination test. The use of the more defined antigen such as the polysaccharide provides greater sensitivity without cross-reactivity with sera against the other three principal caprine mycoplasmas. The indirect haemagglutination test (IHA) has been used for the diagnosis of CCPP. The specificity of IHA test for the *M. mycoides* cluster has been evaluated and results were found to show cross-reactivity between these organisms. An indirect immunosorbent assay (ELISA) was developed to screen goat sera at a single dilution of antibody to *M. capricolum* subsp. *Capripneumoniae*. Some problems due to cross-reactions from other members of the *M. mycoides* cluster were encountered, but in spite of these, ELISA was more sensitive than CFT in detecting antibodies in serum. More recently, a competition ELISA (c-ELISA) was developed which permitted the specific detection of antibodies in sera from animals affected by CCPP. Analysis of field sera showed that sero-conversion did not occur in all animals, whatever test was used. The percentage positive animals in affected herds varied between 30 and 60% with this test. The test was therefore unsuitable as an individual screening

### v) **Latex agglutination test (LAT) (Rurangirwa et al 1987b).**

This test is based on a polysaccharide isolated from Mccp (Rurangirwa et al 1987a) which is used to sensitize latex beads. The sensitized latex beads are then used to detect serum antibodies from goats infected with CCPP (Rurangirwa et al 1987b). The specificity of LAT was assessed using WM25 monoclonal antibody which is specific for Mccp (Rurangirwa et al 1987c; Belton et al 1994) and reacts with the polysaccharide (Rurangirwa et al 1992). The specificity of LAT was further confirmed by evaluating specific growth inhibiting rabbit antisera to various mycoplasma isolates (Rurangirwa et al 1987c).

The sensitised latex beads are stable at 4°C, room temperature and 37°C for over one year. Thus the long shelf-life of the beads at different temperatures makes it possible to prepare large

amounts which can be stored until used. The latex agglutination test is an excellent procedure for the diagnosis of CCPP and can be run in two minutes on samples of whole blood or serum, requires no sophisticated equipment or storage facilities and is adaptable to any laboratory or field conditions - an example of a pen-side diagnostic test. The test is carried out by mixing a drop of the sensitised beads with a drop of blood or serum from the suspected animal on a glass slide for one minute and the results read visually and recorded as positive or negative. LAT combined with presenting clinical signs and necropsy

#### vi) Polymerase chain reaction

A DNA probe which differentiates *M. capricolum* subsp. *capripneumoniae* from other members of the *M. mycoides* cluster has however been developed. Diagnostic systems based on PCR have been developed for the rapid detection, identification and differentiation of members of the *M. mycoides* cluster and the specific identification of *M. capricolum* subsp. *capripneumoniae*. The sequence of the gene for 16S ribosomal RNA has also been used to develop a PCR-based test where the final identification of *M. capricolum* subsp. *capripneumoniae* is made dependant on the pattern of the products after digestion of the PCR product with the restriction enzyme Pst1. polymerase chain reaction based tests have been described and shown to be specific, sensitive and can be applied directly to clinical material, such as lung and pleural fluid.

### 2.8 Disease Treatment

The macrolides (erythromycin, spiramycin, and tylosin), tetracyclines, quinolones and chloramphenicol are active against *M. capricolum* subsp. *capripneumoniae*. Tylosin, tetracycline, tiamulin or streptomycin are recommended but their success depends on early intervention and treatment.

### 2.9 Disease Prevention and Control

Movement restrictions and slaughtering infected animals is recommended for countries that are newly infected. Vaccine against CCPP caused by Mccp is available commercially.

### 2.10 Economic Importance and Impact

Goats are important commodities to a large segment of the world's population as a source of meat, milk, and skin. CCPP is a disease of major economic importance in Africa and Asia, posing a major constraint to goat production. The direct losses of the disease result from its high mortality, reduced milk and meat yield, cost of treatment, control, disease diagnosis and surveillance. In addition to this, there are indirect losses due to the imposition of trade restrictions. This all

contribute to loss of household incomes and in some cases loss of livelihoods.

### **3. LIVESTOCK SECTOR IN SOMALILAND**

#### **3.1 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.

#### **3.2 Production Systems**

The livestock production systems practiced in Somaliland depends upon the region, availability of labour, 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.

##### **3.2.1 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 plateaux 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 labour 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 labor among family members in which young men herd camels while cattle and small ruminants are taken care of by women children and the elderly.

### **3.2.2 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. Some fodder is also grown under irrigation in the river valleys and is based on flooding supplemented with mechanical pumps in some river valleys. There is some small scale irrigation in peri-urban areas based on groundwater extraction, as there is in some coastal areas and in some dry river beds. 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 was initially practiced in the southern and western farming regions, but it 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.

### **3.2.3 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.

### **3.2.4 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%.

### 3.2.4 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.

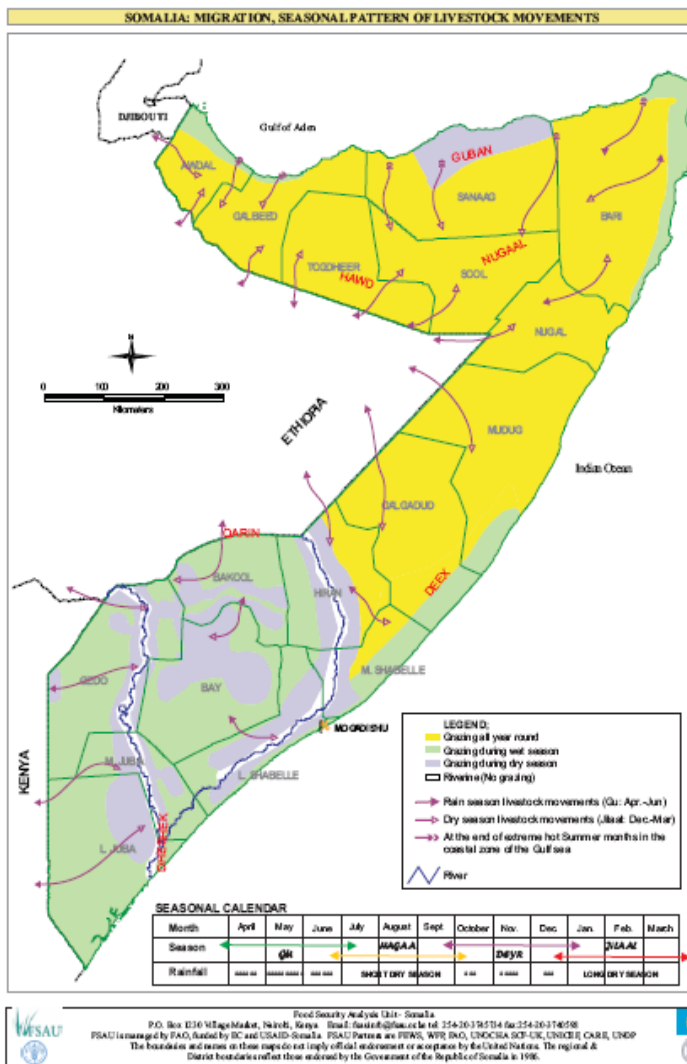


Figure 1: Map showing movement patterns of livestock in the greater Somalia

Courtesy: SAHSP Headquarters

### 4. Livestock Diseases

The most common diseases of livestock which have been confirmed in the past include anthrax, Babesiosis, Brucellosis, Blackquarter, Foot and Mouth disease, Heartwater, trypanosomosis and Rift Valley Fever. Rinderpest was a major problem in the past but control strategies have been successful to a point whereby the country is now able to apply for certification of freedom from disease.

Outbreaks of CBPP occur sporadically in neighboring Southern Somalia especially in the middle and lower Shebelle regions where the disease is considered endemic. Epidemic outbreaks of CCPP with mortality of 25-60% are of particular importance in the Somaliland. In addition to death in the acute form of the disease the chronic form causes debility and emaciation of infected animals.

RVF is at the forefront of many problems that the livestock export trade suffered after a suspected presence in 1998.. RVF is otherwise enzootic throughout Sub-Saharan Africa and Madagascar and reached the Arabian Peninsula in 2000.

## **5. Livestock Markets and Marketing Systems**

Somaliland exports sheep, goats, cattle and camels 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. Berbera is the main export port and is equipped with personnel who carry out inspection and certification of livestock before export.

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

Somaliland has not confirmed CCPP within its goat population but the disease is suspected to be endemic in parts of the country. Preliminary qualitative risk analysis classifies most of Somaliland as being at high risk. The goat population is large and 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:

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

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

Trade is a potential risk factor that facilitates the entry of CCPP disease into the country, especially from neighboring countries where the disease surveillance and control measures are weak. A lot of goats for export are sourced from Ethiopia and Southern and Central Somalia. The prevalence of CCPP in these countries is unknown. There is no official veterinary 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.

## **ii. Pastoralism**

Pastoralism 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 neighbors 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.

## **iii. Animal demographics and trade**

The Sheep and goat population in Somaliland has not been determined for many years. At present it is estimated that the numbers of sheep and goats are about 2,539,360 Sheep and 7,611,590 Goats in the whole of greater Somalia.

CCPP is transmitted by direct contact (droplet infection) between healthy goats and diseased goats or sub clinical carriers. For the transmission to take place close contact between infected and naive animals is of essence due to the high sensitivity of the mycoplasma to the external environment. 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 flock. 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. Stress factors occasioned by malnutrition and movement over long distances predispose the animals to the disease. Breed and sex appear not to affect the epidemiology of CCPP, but age is an important factor. All age groups are susceptible but mortality is higher among the young.

Chronically infected goats are responsible for perpetuation of the disease in a herd (Thiaucourt and Bålske, 1996; Wesonga et al., 1998). Concurrent infections with viral diseases such as Peste des petits ruminants (PPR) and Capripox (Lefèvre et al., 1987b) predispose lung tissue to invasion by mycoplasmas. The role of sheep as reservoirs of infection is not very clear.

The Department of Animal Health has been working through the CBAHWs to detect any changes in the health of the goats 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.

#### **iv. 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 CCPP. 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

#### **7. 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 CCPP within the local goat population**

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

- Unsatisfactory levels of bio-security along the goat 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 (goats are trekked long distances to the export ports). These animals come into contact with local animals. The resultant stress can predispose the animals to the disease.
- Trade animals are not inspected before transportation and neither do they undergo certification before entering the country thereby increasing the risk of sick goats being moved.
- Animals are not quarantined as they enter the country but immediately move into the interior where they come into contact with local goats.
- 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 CCPP 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 CCPP disease, its clinical manifestations in goats 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 flocks without being detected. This may enhance the potential for its establishment and spread in the local goat population.

### **Consequence Assessment**

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

In the event that the disease is introduced to previously free flocks of goats or areas of Somaliland then ***Epidemic*** CCPP may occur. It is characterized by a high incidence of disease in flocks with a high proportion of cases being at the acute end of the clinical spectrum and many deaths (morbidity of 100% and mortality of up to 70%). Spread of infection within and between flocks may be rapid, particularly under conditions where goats are congregated together, such as at watering points and markets and when droving. In endemic areas, sub acute and chronic cases are common but the symptoms are milder. 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 CCPP 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 goats 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 CCPP and its consequences and its desire to continue exporting goats sourced from other countries in the region which do not have effective veterinary systems to detect and deal with any CCPP 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 CCPP 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.

## **8. 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 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**

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

### **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 (SolNAVA); 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.

### **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

## 9. 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 CCPP.

### Passive Surveillance

CCPP, 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 CCPP and risk analysis will be carried out to enhance early detection and reporting of the disease. Active targeted surveys in significant local goat populations and animals on transit to export ports will be conducted to determine prevalence levels of CCPP.

### **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.

## **10. Principles of CCPP Prevention and Control in Somaliland**

The main measures currently available to prevent, control and eradicate CCPP 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 CCPP. This would also ensure the communities cooperation when surveillance and control activities are being conducted.

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

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

It is, however, the unofficial entry of livestock across national borders that presents the greatest risks and is the most difficult to deal with in respect to preventing the entry of CCPP. Such unofficial entry may occur through trading or nomadic or transhumance practices. The sudden influx of refugees with their livestock 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 livestock entries, every effort will be made to make them safer by trying to ensure that only laboratory-tested healthy or vaccinated goats cross at approved entry points. This will entail developing a close working relationship with animal health authorities in neighboring countries, both at the national level and at local levels in provinces adjacent to borders. It also entails developing a close relationship with livestock traders and livestock 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 CCPP activity near the border; that goats are obtained as far as practicable from CCPP-free areas and are healthy and vaccinated against CCPP; and that any goats that are sick are held apart from other goats (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 CCPP and to control and eventually eradicate it if it occurs.

### **11. Early warning Systems**

In order to be able to detect an incursion of CCPP 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 CCPP 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 CCPP 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 CCPP 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 CCPP. 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 cent res,
- 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 goats
- Signs of CCPP
- Control measures to be instituted and the need to cooperate

### **Case definition of CCPP**

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

- high fever ([41-43°C]);
- frequent, violent and productive cough;
- accelerated and labored breathing with painful grunting;

- standing with their front legs wide apart, the neck is stiff and extended downward loss of weight;
- production of stringy saliva continuously drips from their mouth and mucopurulent discharge obstruct their nostrils;
- Death.

The presence of high mortality and typical early thoracic lesions in goats during the acute phase are highly indicative of *M. capricolum subsp capripneumoniae* infection. Sampling using Latex Agglutination Test is then conducted at field level.

The LAT is an example of a pen-side diagnostic test and can be run in two minutes on samples of whole blood or serum, requires no sophisticated equipment or storage facilities and is adaptable to any laboratory or field conditions.

#### Specific surveillance procedures for CCPP

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 CCPP. The coverage that can be provided depends on the proportion of goats 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 CCPP, and will be provided with forms on which they may record their findings. Informal slaughter sites will also be monitored.

The gross pathological lesions are localized exclusively to lung and pleura and are often unilateral.

#### Key Indicators of CCPP in Meat Inspection

- straw-colored fluid with fibrin flocculations in the chest cavity
- gelatinous covering sometimes over the whole lung lungs adhering to the chest wall
- black discolored lung tissue and sequestration of the necrotic lung areas
- Adhesions between the lung and the pleura

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 flocks at these points will be sampled for further laboratory tests.

### **Clinical surveillance**

Both active and passive clinical surveillance are valuable for the early detection of CCPP. Passive clinical surveillance will be encouraged through a comprehensive national programme to the extent that everyone who comes into contact with goats 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 CCPP and to report any suspect cases

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

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

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

### **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 neighboring countries for further analysis.

Several methods for laboratory diagnosis of CCPP are available and depending on the capacity of the laboratory the following tests will be used:

- Culture and identification of Mccp
- Biochemical Tests
- Antigen detection tests
  - Growth inhibition test
  - direct and indirect fluorescent antibody
- Antibody detection tests
  - Complement fixation (microtitre method) (CFT)
  - The competitive enzyme linked immunosorbent assay (c-ELISA)

-Latex Agglutination Test (rapid test)

- Polymerase chain reaction

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.

## **12. Early Reaction contingency planning**

At present there CCPP is suspected but has not been confirmed in goats within Somaliland. Reports from neighboring countries do indicate that the disease is endemic in certain zones within these countries. Somaliland serves as a transit route for goats en-route to the Middle East for export from neighboring countries and therefore is at high risk of an incursion of TADs including CCPP. 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 CCPP eradication strategy**

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

- no domestic livestock species other than goats are susceptible to CCPP (clinical disease and positivity has occasionally been seen in sheep); humans are not susceptible;
- wildlife reservoirs of infection (e.g. gerenuk) are rare in Somaliland;
- *Mccp* is closely related to other mycoplasmas in the 'mycoplasma cluster,' complicating its identification;
- CCPP is transmitted by close direct contact between animals, and thus movement of infected goats 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;
- goats that survive CCPP 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 CCPP one of the more difficult trans-boundary animal diseases to eradicate.

### **Strategies for CCPP eradication**

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

- reduction of the number of infected and potentially infected animals in goat populations through stamping-out campaigns;
- reduction of the rate of direct contact between infected and susceptible goats 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 field diagnosis based on clinical signs followed by confirmation using LAT, 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 Plan 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 CCPP 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),
- 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, 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.

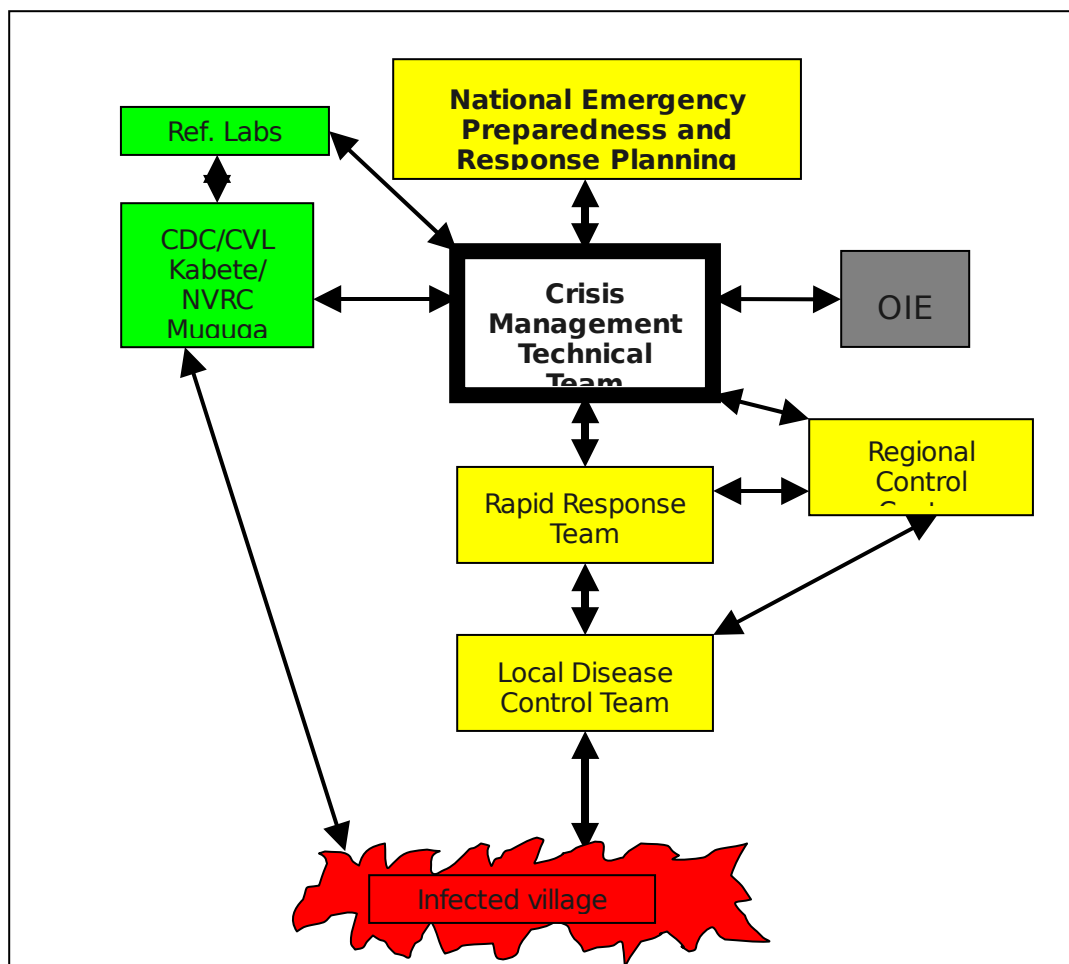
The Department of Animal Health of Somaliland has inadequate capacity to undertake disease surveillance, investigate and respond to widespread outbreaks of CCPP. The DAHS will therefore seek assistance from other government bodies, NGOs and the international community in case of widespread outbreaks of CCPP. 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 totaling 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 quarantine enforcement and maintenance of public order. Through the National Emergency Task Force committee a framework of cooperation between the Ministries of 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 CCPP 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 goats 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 goats to and from these sites and on opportunities that have occurred for mingling of infected and susceptible goats. Based on this initial assessment, three zones would be declared: infected zones; surveillance zones; and CCPP-free zones.

### **Slaughter of Infected and Potentially infected goats - Stamping Out**

A stamping-out programme for CCPP involves the destruction of all infected and potentially infected goats 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, *Mccp*, is not transmitted in meat, consideration will be given to salvaging meat by allowing clinically healthy but CCPP positive goats 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 CCPP 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 goats
- Legal powers
- Rehabilitation programmes for affected farming communities
- Assistance from security agents

### **Vaccination programmes**

Vaccination programmes as components of a CCPP 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 CCPP-free zones. If the disease becomes endemic in certain regions, countrywide programmes will be undertaken.

A freeze-dried saponin killed *Mccp* vaccine which has been shown to confer protective immunity of over 12 months will be used. The freeze-dried antigens are stable for one year after storage at 4°C or 22°C (OIE *Terrestrial Manual* 2008).

Vaccinated goats will be identified by branding or ear notching

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

Having eradicated any CCPP 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 neighboring 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 CCPP-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 goats 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. goats 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.

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

This encompasses the rest of the country. However, because of the potential of CCPP 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 neighboring countries. Comprehensive disease surveillance programmes will be put into place throughout the country, and the zones will be progressively adjusted according to findings.

## References

**Kumar A, Garg DN, (1991).** Isolation of mycoplasma F-38 from the milk of mastitic cows. *Veterinary Record*, 128(18):429; 12 ref

**Lefèvre PC, Jones GE, Ojo MO, (1987).** Pulmonary mycoplasmoses of small ruminants. *Revue Scientifique et Technique, Office International des épizooties*, 6(3):713-757, 759-799; 117 ref.

**Litamoi JK, Wanyangu SW, Siman PK, (1990).** Isolation of *Mycoplasma* biotype F38 from sheep in Kenya. *Tropical Animal Health and Production*, 22(4):260-262; 11 ref.

**McMartin DA, MacOwan KJ, Swift LL, (1980).** A century of classical contagious pleuropneumonia: from original description to aetiology. *British Veterinary Journal*, 136:507-515..

**Ozdemir U., Ozdemir S., March J., Churchwood C. & Nicholas R.A.J. (2005).** Outbreaks of CCPP in the Thrace region of Turkey. *Vet. Rec.*, 156, 286-287

**Thiaucourt F, Bàlske G, (1996).** Contagious caprine pleuropneumonia and other pulmonary mycoplasmoses of sheep and goats. *Revue Scientifique et Technique - Office International des épizooties*, 15(4):1397-1414; 69 ref.

**Wesonga HO, Lindberg R, Litamoi JK, Bàlske G, (1998).** Late lesions of experimental contagious caprine pleuropneumonia caused by *Mycoplasma capricolum* ssp. *capripneumoniae*. *Journal of Veterinary Medicine. Series B*, 45(2):105-114; 22 ref.

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**F.R. Rurangirwa and T.C. McGuire, (1991).** Contagious caprine pleuropneumonia: Diagnosis and control