

Technical Brief on Pestes des Petits Ruminants (PPR), ELMT Livestock Services Technical Working Group

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Introduction

Peste des petits ruminants (PPR) is an acute or sub-acute viral disease of goats and sheep characterized by sudden onset of depression, anorexia, fever, purulent discharges from the eyes and nose, necrotic stomatitis, disturbed breathing and coughing, foul-smelling diarrhea leading to death. Goats and sheep are PPR's natural hosts although goats appear to be more susceptible than sheep, and suffer more severe clinical disease; hence the disease is often referred to as "goat plague".

Infection rates in sheep and goats rise with age, although the disease, which varies in severity, is rapidly fatal in young animals. Cattle, buffaloes, camels and pigs can become infected, although there is little or no evidence of symptoms associated with their infection. The peste des petits ruminant's virus (PPRv) belongs to the morbillivirus group of the paramyxovirus family of viruses. It is closely related to the rinderpest virus of cattle and buffaloes, the measles virus of humans and the distemper virus of dogs and some wild carnivores¹.

Transmission

Transmission of PPRv requires close contact with the infected animals. Discharge from eyes, nose and mouth, as well as the loose faeces, contain large amounts of infective virus. Most infections occur through inhalation of aerosols from the sneezing and coughing animals and transmission can also occur through inanimate objects (*formite*). Trade in small ruminants, at markets where animals from different sources are brought into close contact with one another provides increased opportunities for PPR transmission².

Impact

PPR causes direct and severe economic losses for pastoralist and agro-pastoralist households by depleting their ability to cope and reducing their resilience. This is an additional threat to livelihoods already under severe strain due to recurrent droughts and other shocks.

The presence of this disease is also a major limiting factor for trade, export, and the development of livestock production. It causes a major reduction in animal protein as well as essential micro-nutrients for human consumption.³

Incidence

PPR is endemic in Sub-Saharan Africa, especially in countries between the Sahara and Equator, Middle East (Arabian Peninsula, Israel, Syria, Iraq, Jordan), and the Indian subcontinent. In Africa, its occurrence extends north to Egypt, south east to Kenya, and west to as far as Gabon. Although it has not been confirmed in most of northern and southern Africa, in some countries, particularly in North Africa, there are serological and/or clinical indications that the infection is, nevertheless, present.

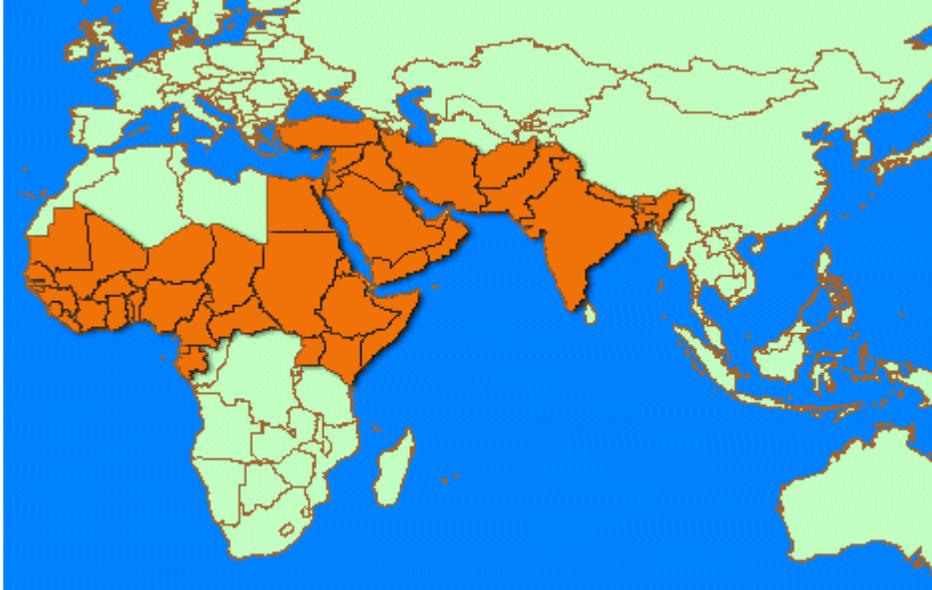
¹ *Recognizing peste des petits ruminants: A field manual. Rome, Italy: FAO, 1999.*

² *Ibid.*

³ See Turk, J. (Feb 2009) Global Food Crisis: The Value of Animal Source Foods in *ELMT/ELSE Newsletter*, Volume 2 http://www.elmt-relpa.org/aesito/elmt?&id_cms_doc=34

(Although a serological survey in 1998 in the United Republic of Tanzania did not detect any antibodies to PPR suggesting that infection has not extended that far south.)

Geographical spread of PPR⁴



In Kenya, this disease was first detected in Turkana district in 2006 and then rapidly spread to the neighbouring districts in the RELPA-ELMT footprint (see Box 1).

⁴ *Recognizing peste des petits ruminants: A field manual. Rome, Italy: FAO 1999.*

Box 1: Highlights on PPR Outbreak in Kenya

- The first case of PPR was reported in Oropoi and Lokichoggio divisions of Turkana District in 2006 and then spread to 16 other districts in the North Rift with Samburu West, Samburu East, Pokot, Marakwet, Baringo and Keiyo districts being the most affected. The disease has since affected livestock in 46 districts in Kenya in North Eastern, Eastern and Coast Provinces.
- According to Livestock Development Permanent Secretary Patrick Khaemba, about 23 million sheep and goats valued at Sh16.1 billion were likely to die of the disease. Since 2006, more than five million sheep and goats have been infected while over two million have died,” said the Livestock Permanent Secretary(PS), noting that the annual loss attributed to the disease stood at more than Sh1 billion (15M US\$). Individual families had lost more than 700 sheep to the plague.
- The recent dry spells/droughts in 2008/9 in ASAL areas is further fanning the spread of the disease due to the high convergence of animals in the few watering points and pastures.
- To contain the spread of the disease, the PS said that the Government had closed all livestock markets and banned movement of animals in the affected provinces of Rift Valley, Coast, Eastern and North Eastern. The Ministry of Livestock Development has stepped up its fight against the dreaded goat plague that is killing thousands of animals in most arid areas in the country. The Ministry of Livestock Development launched a massive vaccination campaign against the viral and infectious disease. The Ministry had already vaccinated four million goats and sheep and added that the campaign would go on for the next five years. More veterinary personnel had been recruited for the exercise.
- The Government in collaboration with development partners had mobilized funds to vaccinate the animals and save the livelihoods of many Kenyans, especially pastoralists. The UN Food and Agricultural Organization (FAO) have supported the Ministry’s efforts by providing two million doses of the vaccine. The United Nations Development Programme (UNDP) has pledged US\$300,000 (Sh20 million) for emergency control of PPR.
- Poverty levels in the ASAL areas are high and poor households more often than not own only a few sheep and goats and no cattle. It is evident that adverse situations such as outbreaks of sheep and goat diseases normally have devastating impacts on food security. Food security in ASAL areas is threatened, adding that the school drop-out rate had risen as many parents could not afford school fees for their children. The food security implications of PPR are huge and, therefore, urgent measures need to be taken to contain its spread and eradicate it. After the disease is contained, mechanisms aimed at rehabilitating the livelihoods of the affected communities will need to be put in place through restocking.

Source: Daily Nation and East African Standard (July to December 2008).

In Somalia, the disease was reported in central regions of Hiran, Middle Shabelle and Galgaduud in 2006. Thereafter, assessment missions led by the Somalia Animal Health Services Project (SAHSP) in collaboration with the Ministry of Livestock, Forestry and Range in Hiran region confirmed the presence of the disease. However, the mission concluded that occurrence of the disease was localized and had not spread widely owing to the geographical position of the area. The risk of further spread remained high since the livestock migrated from one region to the other in search of pasture and water. Ring vaccination was recommended to contain the spread of disease to the surrounding regions which was undertaken by SAHSP, Cooperazione Internazionale (COOPI) and Vétérinaires Sans Frontières Suisse (VSF-S) in 2006. Vaccinations were also conducted in Gedo region of Somalia by VSF-S in May 2009.

In Ethiopia, a PPR outbreak was reported in the pastoralist areas of Yabello *woreda* in September 2008, and later in Dire and Moyale *woredas* in March 2009. The disease has also been found to exist in Afar and Keyeyou pastoral areas in Ethiopia. However, these reports were not confirmed through laboratory tests. As a result, further diagnostic tests are being conducted through the Yabello regional and Sebeta federal veterinary diagnostic laboratories. As the Borana zone government is undertaking its annual vaccination of livestock against CBPP (Contagious Bovine Pleuro Pneumonia) with logistical support from CARE Ethiopia, PPR vaccination will also be included in *woredas* where outbreaks have been reported.

These re-emerging current outbreaks could be caused by a number of factors such as a decrease in veterinary services, the presence of new populations that have not been exposed to the virus,



migration and lack of information sharing on the disease. Although mortality rates and impact information has not been confirmed in all the three countries, indications are that it has had severe socio-economic consequences on food security and livelihoods (see Box 2).

Box 2: KENYA: Livestock disease, high prices fuelling food insecurity



Photo: Ann Weru/IRIN: A young goat affected by the viral disease peste des petits ruminants

LODWAR, 23 July 2008 (IRIN) - Recurrent outbreaks of the viral livestock disease peste des petits ruminants (PPR), which affects goats and sheep, are exacerbating poor food security in the mainly pastoralist Turkana region of Northwestern Kenya.

Community leader Morris Lichokwe told IRIN he had lost 300 goats from a herd of 800 in three months to PPR. The disease, locally known as "Lomoo", had killed thousands of heads of livestock. "Lomoo has really brought us down," said Lichokwe, a resident of the division of Kaaling, in Turkana North district. "Before," he said, "I could sell some of my goats but that is no longer possible. Goats in good health can retail for up to 3,000 shillings [US\$50] each but the price has dropped to as low as 300 shillings [\$5] in some areas." This was due to the closure of the external market as a form of quarantine.

PPR symptoms include lassitude, fever, discharges from the eyes and nose, sores in the mouth, labored breathing and diarrhoea. "There is a need for quick vaccination and de-worming to avoid ruining our livelihoods as we have no agricultural land to sustain us," he said.

"Lomoo clears half the herd. With no medicine we are forced to leave the goats to die," John Ichom, a resident, said. Most of the veterinary stores are in the main towns of Lokichoggio and Kakuma, far from the pastoral areas. Turkana Central District Commissioner George Ayonga said the disease had lowered the purchasing power of the pastoralist community. "You cannot sell a sick goat and even an animal that looks a bit healthy cannot be sold." PPR has been recorded in 16 districts in the north. "Right now people are not selling their livestock," Ali Abdi, a livestock trader, in the Oropoi area, said. "Occasionally when someone brings a goat, I exchange it for a bag of maize flour," Abdi, who also runs a food kiosk, told IRIN. A 50kg bag of maize sells for 1,300 (\$21.60) shillings. Few centres in the district were stocking food when IRIN visited.

According to George Omori, a veterinary officer, the watering sources are far away, unreliable and few have been recharged, reducing the number of times livestock are watered. Dehydration is a risk among PPR-affected livestock. Livestock convergence could also increase the risk of PPR, Omori said: "The animals that have moved south could wipe out the rest in case of an outbreak." Most of the affected were the young not covered by past vaccinations. Omori said there was a need for continuous vaccination for at least three years to control the spread of the disease. The three million goats and sheep in the region were at risk, with at least five outbreaks reported in several areas, he said. Smaller ruminants have a high turnover and thus require frequent disease prevention and control interventions. The PPR vaccine provides protection for about three years for small ruminants.

Source: IRIN Humanitarian News and Analysis, July 2008

Control of PPR

Control of PPR outbreaks relies on movement control (quarantine) combined with the use of focused "ring" vaccination and prophylactic immunization in high-risk populations. Recently, a homologous PPR vaccine has been developed and the vaccine seed is available through the Pan African Veterinary Vaccine Centre (PANVAC) at Debre Zeit, Ethiopia for Africa, or CIRAD-EMVT at Montpellier, France for other areas. Most countries in the region have employed control by vaccination programs. In Kenya, such vaccinations were only conducted after 2006.



This vaccine of choice is becoming increasingly available and can protect small ruminants against PPR for at least three years. Awareness creation on recognizing PPR, how it is spread, its diagnosis, reporting, prevention and control amongst pastoral communities, community animal health workers, veterinarians, traders, and other key livestock stakeholders is fundamental. Livestock traders play an important role in the possible prevention, control and spread of such diseases, and increasing their understanding on the role of trade in controlling/spreading disease is crucial.

The major challenge in control of PPR in the region is lack of adequate information on the dynamics of the disease in the region and inefficiency in early detection, especially because communities and even most of the animal health workers on ground are not familiar with the disease symptoms and may dismiss it as simple pneumonia, CCPP and Orf.

Recommended actions if PPR is suspected:

- Notification to authorities: State and federal veterinarians should be immediately informed of any suspected cases of PPR.
- Quarantine and restrictions on movement of sheep and goats from affected areas. The affected area should be quarantined by avoiding introduction of healthy animals.
- Proper disposal of carcasses of shoats dying of the disease (burned or buried) and disinfecting contact fomites. Most common disinfectants (phenol, sodium hydroxide, alcohol, ether, and detergents) can be used.
- Focused “ring vaccination” in surrounding areas where outbreaks have been detected.

With the threat of spread of the disease in the region, there is need to evaluate the effectiveness of these recommended control and preventive measures.

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