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STRATEGIES FOR THE CONTROL AND ERADICATION OF PESTE DES PETITS RUMINANTS

Amitha Reena Gomes, B. M. Chandranaik, Apsana R
Institute of Animal Health and Veterinary Biologicals, KVAFSU, Hebbal, Bangalore

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Introduction

Peste des petits ruminants (PPR) is a highly contagious infectious disease of viral origin that affects small domestic and wild ruminants. To date, it is the most widely propagated disease in goats and sheep: it affects a billion animals in Africa, Asia and the Middle East. PPR is considered as the most destructive viral disease affecting small ruminant flocks (Fig). It was first described in Côte d'Ivoire of West Africa by 1942. The existence of the disease was subsequently confirmed in Nigeria, Senegal and Ghana. By 1972, the disease had spread to Sudan. Given that the disease affects small ruminants it impacts negatively on the food security of disadvantaged small scale farmers. The disease, which can have a mortality rate of up to 100 percent, has the capacity to disturb the widely acknowledged view that small ruminants are an important means to rebuild herds after environmental and political shocks. It is only recently that the true extent of the disease has been determined, but it is still spreading in Africa, India and other regions of West and South Asia.

To date, the vaccine is the most effective way of controlling the disease. It provides at least three years of immunity, i.e., more than the average economic life span of small ruminants. It has now been used for more than twenty five years (around the globe) and fifteen years (in India) and has proved its scope because of its easy inoculation and its low large-scale production cost. In addition, improved freeze-drying methods have enhanced its stability in the production phase, and during its reconstitution under hot climatic conditions. This paper outlines some of the important preventive and control measures for the disease.

Principles of disease control and eradication

1. Denial of access of the disease agent to the susceptible host animals

This may be achieved by good biosecurity and biocontainment methods.

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2. Avoiding contact between infected and susceptible animals

With such controls, the movement of susceptible animals is only permitted under strict, designated conditions when it is deemed safe. There may also be bans or restrictions placed upon the congregation of susceptible animals such as at livestock markets and melas.

3. Reducing the number of susceptible animals

In emergency disease control it is usually achieved by vaccination of susceptible animals. Vaccination may be done selectively (for example ring vaccination around infected areas) or as blanket vaccination programs in susceptible animal populations.

Animal affected with PPR showing nasal discharge and diarrhoea

Strategies for disease control and eradication

1. Vaccination

Well planned, comprehensive vaccination programs, supplemented by other disease control measures, can go a long way towards eliminating many epidemic livestock diseases. To halt further spread of the disease, targeted vaccination of small ruminants based on critical control points such as livestock markets and transport routes used by traders and nomadic farmers is recommended. The advantages of vaccination as a control option for PPR are that the live attenuated vaccine is readily available and very cheap. It confers durable immunity which lasts for 3 years and hence most animals will only need fewer doses in their lifetime. However, annual vaccination is recommended due to the high reproductive rate of small ruminants. The current vaccine strain of India especially the Sungri/96 is protective against all circulating strains. The only current disadvantage for countries which are still free from

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infection is the lack of a DIVA (differentiation of infected and vaccinated animals) test to distinguish between infection and vaccination. Proper affordable identification/marking such as ear notching of the vaccinated animals is therefore of utmost importance because of the value it presents in distinguishing vaccinated animals from unvaccinated ones.

The aim in vaccinating a population of animals is not only to protect the animals that are actually immunized, but also to cut down the rate of transmission of the pathogen in the target population. The latter is often referred to as flock/herd immunity and near a hundred percent or more than eighty five percent vaccine coverage may be quoted as the figure to achieve this.

2. Stamping out

This option is favoured only in situations where the infected population is small and well defined, and the government has mechanisms in place to compensate the affected farmers. The ability to regain previous disease free status quickly and therefore be able to trade again is the biggest advantage of this option. The option is best suited for high risk areas with a low density of animals and for low risk areas. The main disadvantage of this option is that it is usually an expensive and therefore unattractive exercise for the State and as a result, there is a little political will to implement stamping out. It also has social and economically devastating consequences for affected communities even if they will be compensated. Other disadvantages linked to this option are loss of genetic material, it diminishes the national herd, which is difficult to carry out in light of lack of fences and zones to curtail movement in the event of an outbreak and last but least it is politically very difficult.

3. **Zoning**

Zoning as a concept for protection against PPR in the region should be viewed from two standpoints; zoning based on risk of infection within the state and also between the states. Risk areas can be divided into infected zone, high risk zone and low Risk zones. Internally as each individual country maps out its risk zones it is important to understand the dynamics of small stock rearing in those areas and how these may affect the risk, for example movement patterns, rearing systems and market factors.

4. Bio-security

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To stem the spread of PPR in the region it will be critical to observe strict biosecurity and biosafety measures. Illegal movements from high risk areas should result in stiff penalties for offenders. At the same time it will be important for government and veterinary authorities to develop systems from an incremental level upwards to facilitate trade, once there is evidence that the disease is no longer present. Authorities should not be perceived to be unduly restricting legitimate trade but instead to be doing everything possible to facilitate legitimate trade whenever possible. Measures such as building of quarantine facilities at border points to screen and clear clean animals for trade should be encouraged.

There should however be restrictions on live animal movement from high risk areas. No trade of live animals should take place from such areas until freedom is attained in accordance with OIE guidelines. All stakeholders such as the police, customs officials and farmers themselves must be engaged to support the movement restrictions from infected areas.

5. Capacity-building needs

Create awareness through simple technical messages via audio visual aids for farmers, traders, politicians, community leaders, the media, law enforcement officers, and the general public at large. There will be a need to train field staff in the available control options such as vaccination, stamping out, zoning, and biosecurity. Provide the necessary material and financial resources to implement the available control options.

To summarize, intensive vaccination of the entire population within a specified area would need to be undertaken. Subsequent vaccinations would then be performed on younger animals at approximately 6 months of age.