PESTE DES PETITS RUMINANTS (PPR) SERO-SURVEY IN SHEEP AND GOAT HERDS OF MARSABIT COUNTY, KENYA

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INTRODUCTION

- Livestock assets are an important source of food and economic security for the 10 million people living in the Arid and Semi-Arid Lands (ASALs) of Kenya.
- PPR is a highly infectious viral disease of sheep and goats that was officially reported in Kenya in 2006. PPR is associated with significant socio-economic losses due to the high case fatality rate.
- Exposure to PPR virus through vaccination or natural infections results in a 3 year or life long immunity. Control strategies in Kenya began in 2008 with the implementation of a 5-year nation wide vaccination campaign. However, control measures have failed to prevent disease outbreaks especially in Northern Kenya.
- A herd seroprevalence of 60 to 80% stops PPR virus circulation and significantly reduces outbreaks in endemic areas.
- A cross-sectional sero-survey was conducted between August 2014 and March 2015 with the overall aim of determining antibody levels against PPR virus in sheep and goat herds from PPR endemic areas of Marsabit County. The study findings will inform PPR surveillance and vaccination control programmes.

STUDY OBJECTIVES

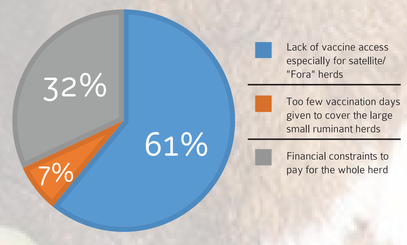
- To characterise PPR disease control practices amongst pastoral communities residing in PPR endemic areas of Marsabit County.
- To determine antibody prevalence levels against PPR virus in sheep and goat herds from PPR endemic areas in Marsabit County.
- To identify factors associated with PPR seroprevalence using spatial statistical techniques.

RESULTS

PPR disease control practices

- Knowledge of PPR clinical signs was high (71%) amongst livestock owners interviewed from the Southern parts of Marsabit but low in the Northern parts of Marsabit where PPR was confused with other diseases such as Contagious Caprine Pleuropneumoniae (CCPP), helminthiasis and tick borne diseases such as babesiosis.
- The most common risk practices that resulted in PPR introduction was mixing animals of different herds at communal watering areas and introduction of infected new stock into herds.
- Avoidance of infected areas was the most common preventive PPR strategy used by 61% of small ruminant owners interviewed.
  Only 21% of livestock owners were able to access veterinary services for their small ruminant herds.
- The main challenge facing PPR vaccination campaigns was the lack of access to vaccines especially for satellite herds 'fora'. Other challenges are shown in the pie chart below.

Challenges facing small ruminant PPR vaccination activities in Marsabit County (August 2014 -March 2015)



PPR seroprevalence and associated factors

The apparent PPR seroprevalence was 22%. Factors associated with PPR seropositivity were;

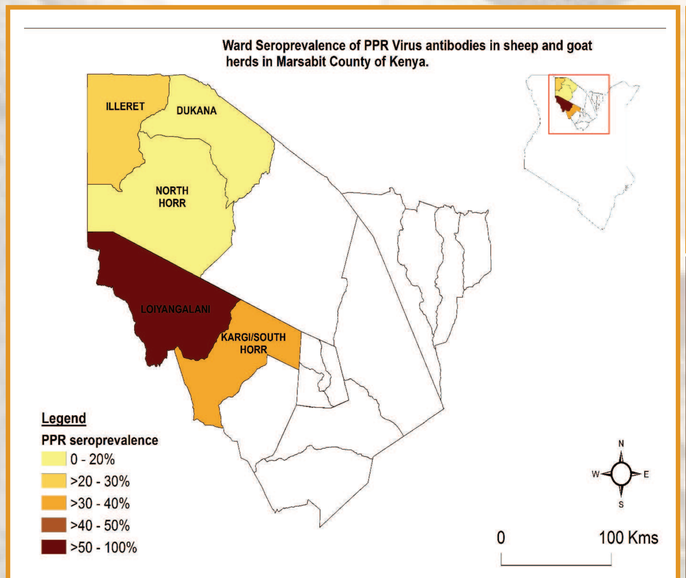
1. Geographical location of animals
2. Age of animal,
3. Past PPR incidence and
4. Access to PPR vaccine.

Blood sample collection at Illeret, Marsabit County (February-March 2015)

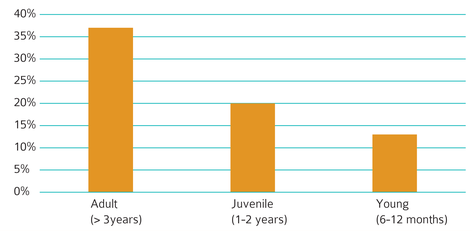
Questionnaire interview with small ruminant livestock owners at Loiyangalani, Marsabit County (August 2014)

Table showing ranking of important small ruminant diseases by livestock keepers in Marsabit County (August 2014- March 2015)

Type of disease	Percentage response
SHEEP	
Pneumoniae (CCPP similarity)	50%
Enterotoxaemia	28%
Sheep pox	12%
Anthrax	10%
GOATS	
CCPP	57%
PPR	19%
Helminthiasis	10%
Tick borne infections	14%



PPR seroprevalence across age groups (August 2014 - March 2015)



DATA COLLECTION AND ANALYSIS

- Ethical clearance was obtained from the University of Nairobi, Faculty of Veterinary Medicine, Biosafety, Animal use and Ethics Committee. In addition, livestock owners gave a verbal and signed consent to participate in the survey.
- The sero-survey was conducted across 28 Sites which were purposively selected based on previous reports of PPR outbreaks from passive and participatory disease surveillance records.
- The survey used both qualitative (questionnaire) and quantitative laboratory (C-ELISA) techniques. A total of 322 small ruminants were sampled of these, 179 were goats and 143 were sheep. The study ensured representation from each age category, 101 Adult animals (> 3years), 105 juvenile animals (1 - 2 years) and 116 young animals (6 - 12 months) were sampled during the survey period.
- Data was analysed using IBM Statistical Package for Social Sciences (SPSS) version 22. The map was generated using ArcGIS for desktop version 10.1 (ESRI Corp., USA).

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KEY CONCLUSIONS

- The 22% PPR seroprevalence was lower than the recommended 70% that stops virus circulation in endemic areas. Surveyed animals were therefore susceptible to future outbreaks.
- Small ruminant vaccination programmes should combine vaccination for other important diseases such as CCPP in goats and enterotoxaemia in sheep. Vaccination should target young and juvenile animals as they had the lowest PPR seroprevalence levels.
- Conducting a livestock census is a pending and urgent need that will ensure better planning and coverage of vaccination control programmes.
- Post vaccination sero-surveys can be used as a tool to monitor the access and efficacy of PPR vaccination activities.
- County government should direct financial and human resources to PPR endemic areas (Laisamis, Illeret and Dukana). Targeting vaccination activities will reduce clinical PPR cases and prevent virus spread to high risk areas (North horr).
- The Pneumoniae disease in sheep had clinical signs that were similar to CCPP in goats there is need for further research to determine if the Pneumoniae is due to the same Mycoplasma bacterial agent or other infectious or parasitic agents.

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