

Screening of goats for Contagious Caprine Plueropneumonia caused by *Mycoplasma capricolum* subspecies *capripneumoniae* (biotype F38) in ranches with potential for export

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Abstract

Contagious Caprine Plueropneumonia (CCPP) caused by *Mycoplasma capricolum* subspecies *capripneumoniae* (*M. capripneumoniae*, biotype F38) is the most contagious and virulent type of pneumonia in goats. It is an important trade disease associated with both direct and indirect costs arising from mortality (ranges from 60-100%) and trade restrictions (in import and export) respectively. The OIE Terrestrial code requires that in endemic regions, goats for export be vaccinated within a period of 4 months prior to shipment or be subjected to a complement fixation test with negative results, on two occasions. The two tests should be at an interval of not less than 21 days and not more than 30 days between each test, with the second test being performed within 14 days prior to shipment. In Kenya, it is a requirement that both vaccination and testing be carried out prior to export. A study was undertaken to assess the CCPP situation in selected ranches that have potential for export. A total of 1400 goats were observed in Taru ranches before 140 goats were randomly selected, bled and tested for important trade diseases, including CCPP, PPR, Brucellosis and RFV. Approximately 2 goats in each flock were in poor body condition and showed signs of persistent cough. In Laikipia district, a total of 100 goats and 100 sheep were sampled. To test for CCPP, the complement fixation test (CFT) was used. Out of the 140 serum samples from Taru ranches, 4 (3%) were found positive for CCPP. All goats from Laikipia district were negative for CCPP, while 5 sheep were positive on CFT for CCPP. These findings

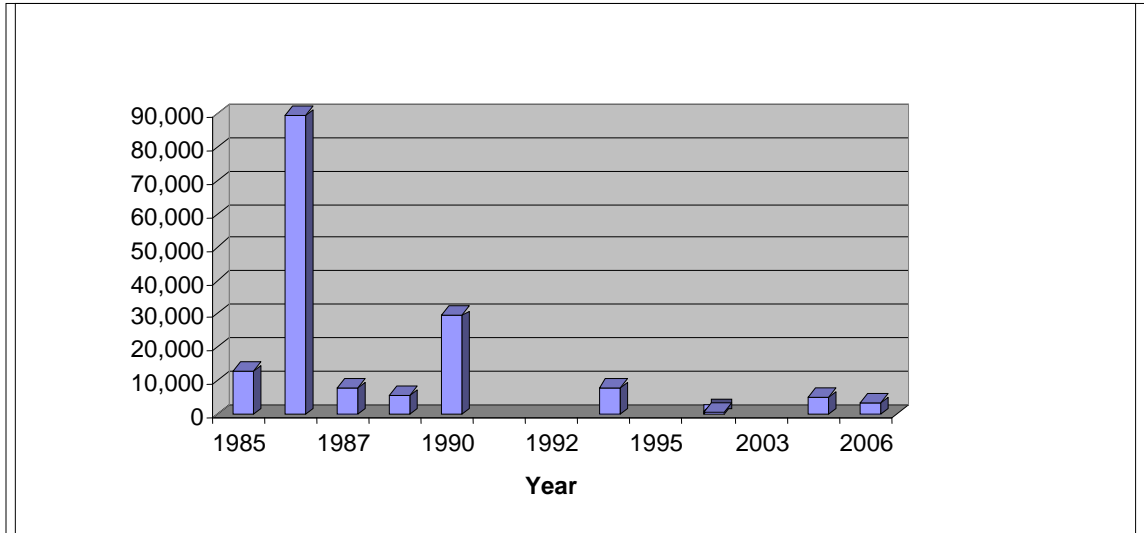
indicate that Kenya is able to export CCPP free goats as per the Sanitary and phytosanitary (SPS) requirements.

Introduction

Small ruminants particularly the goats are known to be the dominant livestock species in Africa, which may reflect the high dependency of farmers to these animals. They are important essential assets for livelihoods and key to moving out of poverty, as well as important cultural resources, and as a way into lucrative markets and a source of foreign exchange. Goats constitute major livestock species kept in ASALs since they are highly adapted to harsh environmental conditions and they have a huge potential for export. Kenya has an estimated 13 million goats and currently meat production nationally stands at 68,000 Metric Tonnes of mutton and chevron. Between March 2007 and March 2009, Kenya Meat Commission (KMC) has exported 22,767 Kgs of goat meat to Kuwait, Qatar and UAE (DVS Kenya, Annual reports). There is evidence to show that Kenya exported live goats to various countries including the UAE to as recent as in the year 2006. (Table 1)

However farmers have to be content with a variety of husbandry problems including bacterial, viral and parasitic that limits beneficial impact on the economic exploitation of the goats. Currently Contagious Caprine Pluero Pneumonia is a major limiting factor to productivity and proliferation of these class of livestock. The disease is a major constraint to goat production, with both direct and indirect effects. The high mortality, reduced milk and meat production, and the costs of treatment, control, diagnosis and surveillance all have a direct effect on the goat industry. In addition to these, there are indirect losses due to the implementation of trade restrictions. In order to capture more lucrative markets under the creation of the disease free zones, there is a need to review the CCPP situation in Kenya, document the incidence, identify its role as a barrier to goat production and trade and generate information that will enable policy makers and other stakeholders to promote trade in small ruminants especially goats.

Figure 1: Export of small ruminants (1985-2006)



Materials and methods

Study areas

Ranches with high potential for export were chosen in Laikipia and Mombasa. These were considerably sites because they fall into the proposed sites for the creation of disease free zones (DFZs).

Taru Ranches

Taru ranch is in Kinango District of the Coast province. The ranch is used for fattening and finishing of livestock originating from North Eastern Province destined for either the domestic market in Nairobi and Mombasa or for export. The ranch measures 57,000 acres.

A total of 1400 goats purchased from different parts of the coast province as far as Tana district were kept in the Taru ranches. The goats were managed in 6 flocks of between 200-250 animals. The purpose of this was to prepare the animals for trade by fattening, administering the necessary treatments which included dewormings and vaccinations against trade relevant diseases.

Sampling

The study was carried out in the months of September 2008. A total of 1400 goats were observed physically for general body condition, signs of diseases and presence of ecto parasites. A total of 20-25 goats were randomly selected per flock fully restrained and blood drawn from the jugular vein into siliconised plain vacutainer tube. The samples were labeled and placed into a cool box packed with ice brick and transported to the regional Veterinary Investigation Laboratory at Mariakani for spinning and storage. The serum was later transported to the CCPP regional center at Muguga Laboratory for analysis. A total of 140 serum samples were obtained and tested.

Laikipia Ranches

Laikipia ranches are found in the Eastern province. The most import economic activity on the ranches is livestock keeping for commercial purposes.

Sampling

There are a total of 18 ranches in Laikipia. Five ranches were conveniently selected for sampling. The ranches were Mugwoon, Ol pejeta, Ol Maiser, Mutara and Lol Daiga hill. A total of 20 goats and 20 sheep per ranch were randomly selected and bled. The sera was spun at the Nanyuki Veterinary Office and transported to Muguga for Laboratory analysis.

Laboratory analysis

The Compliment Fixation Test was used. It is the currently OIE recommended test of trade. The technique of the Office International des Epizooties (OIE, 2000) was followed with some modifications.

Data Analysis

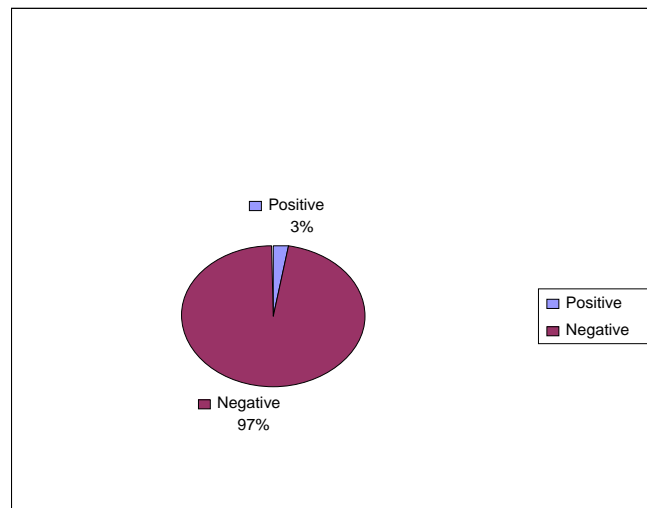
Microsoft excel soft-ware was used to store the data and analysis of ordinary statistics.

Results

Taru Ranch

In the flock held at Taru, 2 goats in each of the 6 flocks appeared to be in poor body condition, with ribs showing. There were signs of persistent cough suggestive of a respiratory infection

Figure 2: Prevalence of CCPP in Goats in Taru Ranch



Out of 140 serum samples collected from Taru Ranch, 4 were positive for CCPP by CFT. The overall prevalence was 3% as shown in Figure 1 above.

Laikipia Ranches

The animals in the flock appeared to be in good body condition and a good indicator of health was the high twinning rate in the flocks. However the ranches reported to have problems with their sheep flocks and reported losses of up to 50%.

All the serum was negative for CCPP in the goats. However 5 sheep from two ranches (Mugwoon 3 and Ol Maiser 2) were positive on CCPP.

Discussion

Goats are important commodities to a large segment of the world's population as a source of meat, milk, and hide. Contagious caprine plueropnuemonia (CCPP) is a significant economic disease of goats in Africa, the Middle East and Western Asia, and is characterised primarily by its contagious nature (Sharew *et al.*, 2005). The direct losses of the disease result from the high mortality, reduced milk and meat yield, cost of treatment, control, disease diagnosis and surveillance. In addition to these, there are indirect losses from the imposition of trade restrictions (OIE, 2007). It has a morbidity of 100% and the mortality ranges from 60-100% (Rurangirwa *et al.*, 1981). The causative agent of CCPP is *Mycoplasma capricolum* subsp. *capripneumoniae* (Mccp), which was previously known by the strain name of its type species, F38.

CCPP is OIE listed as an important transboundary disease. It is a trade disease and indirect costs arise from trade restrictions in import and export of goats. In Kenya, the disease was initially not considered serious and was only declared notifiable in the year 1984. It still attracts a charge of Ksh 8 per goat compared to other similar diseases as CBPP which are offered for free as a public good (DVS, 2009, personal communication)

The results from Laikipia district indicate that we have CCPP clean flocks in the country. Laikipia falls in the proposed sites for creation of DFZs. As a fulfillment of some of the Sanitary and phytosanitary (SPS) requirements, it is possible to export CCPP clean goats from the country. The ranches had a good history of previous annual vaccinations. The lyophilised Mccp vaccine currently produced only in Kenya has been shown to induce immunity in goats. The vaccine protects goats totally against mortality and is said to be 95% efficacious against clinical disease (Rurangirwa, 1996).

Contagious caprine plueropnuemonia caused by Mccp is reported to affect only goats (Thiaucourt and Bšlske, 1996) but not sheep (Kumar and Garg, 1991). The findings of CCPP positive sheep was interesting and calls for further research. It is important to note

that in the ranches traditional type of husbandry is still practised and the two species of animals are kept in close contact. However, there are some reports describing the isolation of *M. capricolum* subsp. *capripneumoniae* from healthy sheep in Kenya that have been in contact with goat herds affected by CCPP (Litamoi, *et al.*, 1990), and from sick sheep in contact with goats suffering from the disease (Thiaucourt and Bšlske, 1996).

The field serological prevalence of 3% reported in Taru ranches was much lower than results reported elsewhere in the region. Sharew *et al.*, (2005), reported prevalence rates ranging between 52% and 100% in districts within Ethiopia.

The goats that were kept in the Taru had recently been purchased from different places in the Coast province. It is probable that the animals had undergone a lot of stress while being moved to come down with clinical disease. This could be explained by findings elsewhere that in relation to respiratory infections, change in temperature and relative humidity can bring about an increase in survival and virulence of pathogens while lowering the resistance of the host (Dennis, 1986).

Herds shift from one grazing area to another also result in high rate of contact. This is true in the ranch as animals move from one site to another in search of pasture and water. Herd contact during grazing and watering has been reported to be ideal for the transmission of mycoplasma (Seifert 1996, Masiga *et al.*, 1996).

Conclusions

There are clean CCPP zones in the country and these gives the country a huge potential for export of live goats to both existing and new markets. One important alternative is the big prospective in commodity-based trade in this case the chevron. This focuses on the quality of each product and how it was produced, rather than where it originated. Such an approach would not undermine disease control and eradication measures, but would actually have greater incentives to strengthen veterinary services and improve disease control.

Recommendation

For purposes of this study it would be important to undertake further investigations to establish reasons for positive sheep.

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