

**THE EPIDEMIOLOGY OF FOOT-AND –MOUTH DISEASE VIRUS IN CATTLE AT
THE LIVESTOCK-WILDLIFE INTERFACE OF QUEEN ELIZABETH NATIONAL
PARK IN UGANDA**

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Abstract

Foot-and-mouth disease (FMD) is an economically significant viral disease of cloven hoofed livestock and wildlife that occurs in Uganda, there is inadequate understanding of the disease and its occurrence is associated with its existence in the buffalo in the Ugandan National Parks. This study investigated the possibility of FMDV transmission between the Buffalo and cattle and the role played by cattle that graze closely to the Buffalo in Kasese district at the Queen Elizabeth National Park Livestock wildlife interface. At the same time, the persistence of antibodies elicited by the trivalent FMD vaccine used in controlling FMD in Uganda was also undertaken.

Four different studies that targeted 6-24 months old cattle born four years after the last reported FMD outbreak in Kasese (in 2006) were undertaken. An initial random sampling of 247 cattle in 2011, six random samplings over a period of 2 years (2011 to 2013) and a systematic sampling of two sentinel herds each with 20 cattle from an FMD-free area. Half of the sentinel herd animals plus an additional 15 other Ankole young cattle were vaccinated and monitored for vaccine response.

The presence of antibodies against FMDV were analyzed in sera using PrioCHEK®FMD_NS, solid phase blocking ELISA and Virus Neutralization Tests, while the presence of FMDV in probangs was investigated using reverse transcription-polymerase chain reaction, cell culture, antigen detection ELISA and subsequent sequencing of the identified FMDVs.

The study identified two SAT I s and a new SAT 3 FMDV in clinically healthy Ankole cattle that were different from the previous buffalo and cattle strains. The SAT 1 isolates were also different from the current vaccine strain (SAT 1 155/71). As a result, there was insufficient evidence to demonstrate that transmission of FMDV between cattle and the Buffalo does occur at this LW-interface. The neutralizing antibodies demonstrated against serotypes O, SAT 1, SAT 2 and SAT 3 in these surveys concurred with the SPBE serotyping results that showed antibodies against serotypes O, SAT 1 and SAT 2, but without manifestation of clinical signs. The evidence of contact with serotypes O, SAT 1, SAT 2 and SAT 3 from these young unvaccinated animals shows that multiple FMDV serotypes do occur sub clinically at this LW interface. This implies that cattle may be important in the epidemiology of FMDV. The vaccine efficacy assessment showed that the antibody responses against the three vaccine strains waned before 93 days necessitating booster doses to sustain high antibody levels for long periods. Continuous FMD surveillance and research

on the subclinical occurrence of FMD is recommended if the role of cattle in the epidemiology of

FMDV in Uganda is to be fully understood.