

The control of Foot and Mouth Disease in Botswana and Zimbabwe

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Abstract

Foot and Mouth Disease is an OIE list A disease that seriously constraints livestock production in southern Africa. Two important livestock producers and beef exporting countries, Botswana and Zimbabwe, have put in place an effective FMD control system. The system is based on the division of the country in risk zones and appropriate disease surveillance, livestock identification and movement restriction and control in the different risk zones. Vaccination is carried out in the designated vaccination zones.

Keywords: Livestock, Foot and Mouth Disease, Southern Africa, Disease control system

Résumé

La fièvre aphteuse (FMD) est une maladie classée A par l'OIE, qui limite sérieusement la production animale en Afrique australe. Le Botswana et le Zimbabwe, tous deux grands producteurs de bétail et exportateurs de viande de boeuf, ont mis en place un système efficace de contrôle de la FMD. Le système est basé sur la division du pays en zones à risque avec surveillance adaptée de la maladie, sur l'identification du bétail et la limitation des mouvements ainsi que le contrôle dans les différentes zones à risque. La vaccination est effectuée dans les zones de vaccination désignées.

Mots-clés: Bétail, Fièvre aphteuse, Afrique australe, Système de contrôle de maladies

Resumo

A febre aftosa (FMD) é uma doença da lista A da Organização Mundial de Saúde animal (OIE) que restringe seriamente a produção pecuária no sul da África. Dois importantes países produtores pecuários e exportadores de carne bovina, Botsuana e Zimbábue, introduziram um sistema de controle eficaz contra FMD. O sistema baseia-se na divisão do país em zonas de risco e em uma apropriada vigilância da doença, identificação e restrição do movimento do rebanho e controle nas diferentes zonas de risco. A vacinação é realizada nas zonas designadas.

Palavras-chave: Pecuária, Febre aftosa, Sul da África, Sistema de controle de doença

Introduction

Among the diseases listed in the OIE list A, Foot and Mouth Disease (FMD) constitutes a significant constraint to international trade in live animals and animal products. The disease is reported in two-thirds of the OIE member states (Vosloo *et al.*, 2002). Recent outbreaks of FMD (2000 – 2003) have affected millions of animals in Europe, Asia and Africa (*i.a.* in the United Kingdom, Taiwan, South Africa and Zimbabwe). These outbreaks have revived concerns about the adequacy of early detection systems required to prevent such epidemics.

In Africa FMD is highly prevalent. However, many African countries allocate low priority to FMD resulting in an underreporting of the number of outbreaks to the OIE. Six of the seven FMD virus serotypes occur in Africa and three of these (the Southern African Territories (SAT 1, 2 and 3) are unique to Africa. They are mainly found in southern Africa and are associated with the African buffalo (*Syncerus caffer*) which acts as reservoir of infection to domestic animals (Sutmoller *et al.*, 2000).

As a result of effective control, some countries of southern Africa have gained access to the lucrative beef and other livestock markets in Europe resulting in huge economic benefits. Zimbabwe and Botswana, for example, are two countries that through the establishment of a range of effective measures to control FMD have benefited from such exports.

FMD control measures in Botswana and Zimbabwe

The organization of veterinary services

Botswana – In Botswana, the backbone of animal disease control is the Diseases of Animals Act (28 January 1977). The Act provides for the prevention and control of animal diseases, the regulation of imports and exports, the movement of animals and animal related products and, under certain circumstances, the quarantine of animals.

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The country is compartmentalized into disease control zones with cordon fences between the different zones (Figure 1).

These fences, initially aimed at preventing close contact between the African buffalo and domestic livestock, are mostly found in the northern part of the country where the most important reservoir of the FMD virus is almost exclusively found. The country has 19 veterinary districts, divided over 6

regional offices. One or more disease control zone may fall within a veterinary district. Each district is further divided into extension areas each comprising 8-10 crushpens manned by an animal health technician under the supervision of a state veterinarian.

Zimbabwe – In Zimbabwe, disease surveillance, monitoring and reporting relies on a country-wide network of Veterinary Offices (Figure 2).

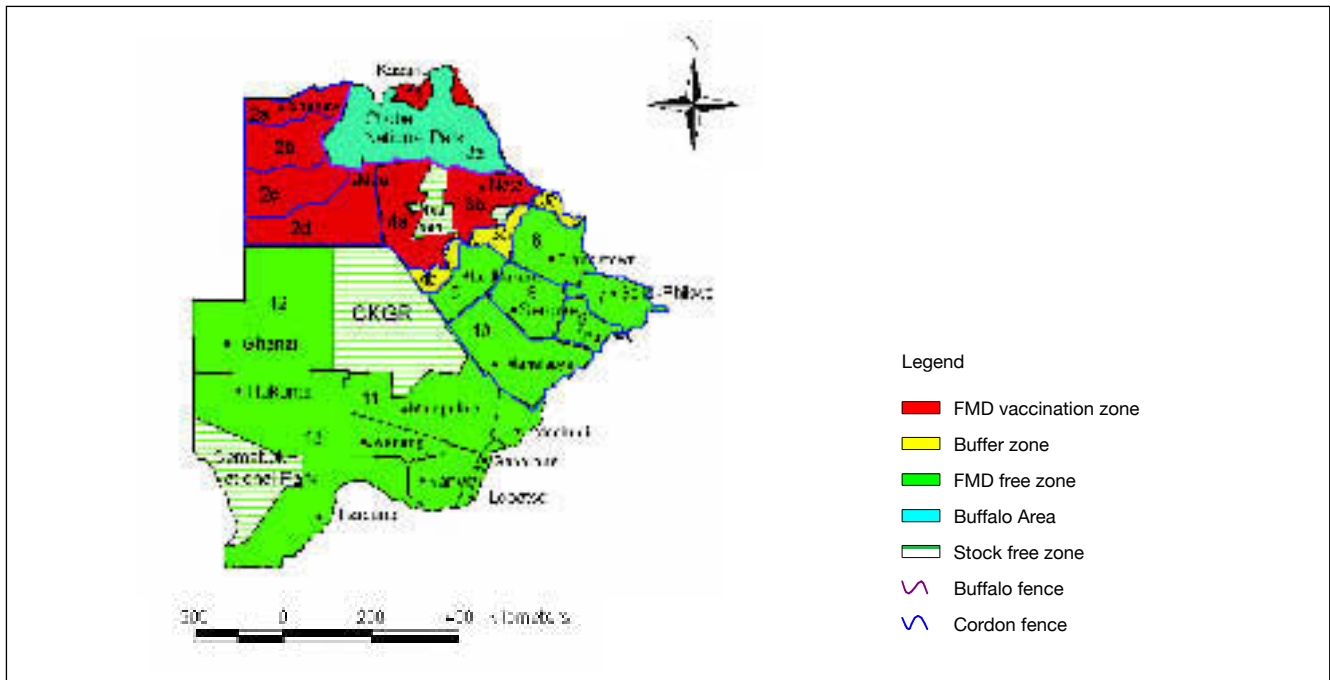


Figure 1: Map of Botswana showing disease control zones and cordon fences.

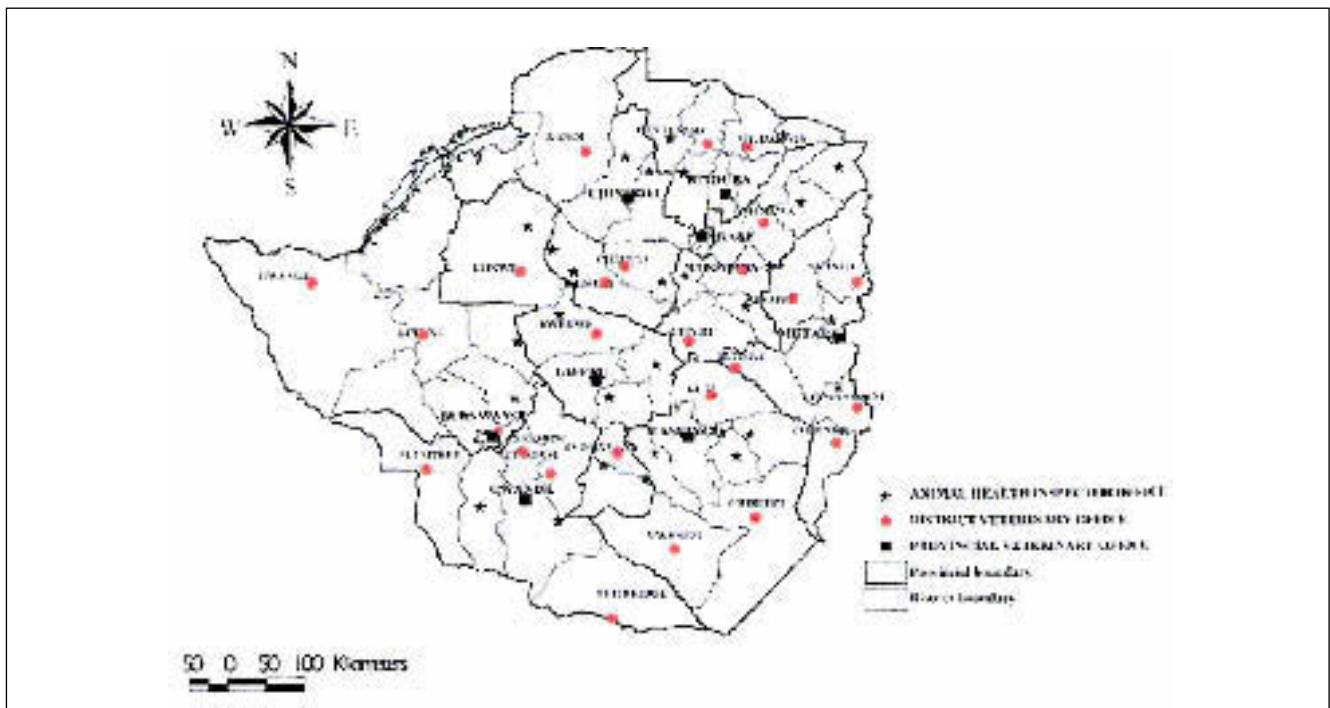


Figure 2: Location of veterinary offices in Zimbabwe.

They comprise 8 Provincial Veterinary Offices and 3 Provincial Diagnostic Laboratories (at Bulawayo, Mutare and Masvingo). There are 54 District veterinary offices of which most are headed by Veterinarians, 8 sub-district offices in the Commercial Farming Areas and 308 Animal Health Management Centres in Communal areas. A network of 632 dip tanks for tick control are located in both Commercial and Communal areas.

The control of FMD in Botswana

Historically, Botswana had three regions where FMD outbreaks were likely to occur (Falconer, 1972). They were Ngamiland and the Chobe area (now zones 2 and 1 respectively), the Boteti river area (now zone 4a) and the Nata area (now zone 3b), (Figure 1). From the early 1950s physical barriers in the form of livestock fences were strategically constructed within these regions to prevent spread of the disease from infected buffalo to susceptible livestock. Until 1963, movement controls were supported by aphtisation. The latter involved the artificial infection of animals within the FMD control areas with live virus obtained from infected animals.

Vaccination -- In 1965, a policy of annual vaccination, using attenuated vaccines incorporating the SAT1 and SAT3 serotypes, was initiated (Falconer, 1972). This vaccine was altered in 1969 by including the SAT3 serotype. Currently, vaccination of cattle using the trivalent vaccine is conducted twice per year (March/April and October/September) within disease control zones 2b-2d, 4a and 3b. In zones 1 and 2a vaccination is performed three times a year (March, July and November). The latter is due to the higher risk of cattle-buffalo contact. During each FMD vaccination campaign, all cattle from the vaccinated zones are

branded for identification purposes. Because of their apparently insignificant role in the epidemiology of FMD in Botswana, goats and sheep are not vaccinated. Pigs are also not vaccinated since there are very few in the communal areas.

Fencing and inspections -- A buffalo fence separates the national parks from the vaccination zones (Figure 1). In the event of buffalo incursions into any of the vaccination zones 2, 4a and 3b, oral inspection or mouching for FMD lesions of all cattle belonging to crushpens in the vicinity of the incursions/sightings is performed at intervals of two weeks until the area has been cleared of the buffalo and the absence of the disease in livestock confirmed.

Movement control -- The movement of animal and animal product between disease control zones is regulated by movement protocol and sanctioned through official movement permits. Internal movement permits can be issued by state veterinarians and animal health technicians from the districts. International movement permits, on the other hand, are issued by state veterinarians based at the veterinary headquarters in Gaborone. Strategically positioned disease control gates and animal quarantine facilities around the country allow for inspection of permits and animals before further movement.

Livestock traceability and identification -- Since 1999, Botswana also benefits from a computerized system of individual animal identification based on the reticular bolus. This "Livestock Identification and Traceability System" (LITS) is currently adopted in cattle only, but it is intended that it will be gradually transferred to other livestock species in the country (Figure 3).



A



B

Figure 3: The new "Livestock Identification and Traceability System". Insertion of the bolus (A) and identification of each animal as it passes through the crushpen using a static reader (B) (Printed with permission from VEES, Department of Animal health and Production).

General disease surveillance – Disease surveillance is conducted by state veterinarians, animal health technicians and private veterinarians in the course of their normal daily duties conduct.

The control of FMD in Zimbabwe

In Zimbabwe, FMD is a notifiable disease under the Animal Health Act (AHA) (Foot and Mouth) Regulations, (1971) and by the Animal Health (General) Regulations, (1994).

Zoning and fencing -- For the purposes of FMD control, Zimbabwe is zoned using a network of approximately 3000 km of cattle and 1500 km of game fences. Four different zones are distinguished (Figure 3). They are (i) the infected zones (National parks where wildlife including African buffalo are found), (ii) the vaccination zones (Red zones) immediately adjacent to the infected areas, (iii) the buffer zones (Green zones) adjacent to the red zones and (iv) the clear zones and European Union (EU) catchment (export) areas. The clear and catchment areas are further sub-divided into smaller units usually based on district boundaries, and have different brand-marks. (Figure 4).

coded brand upon transfer.

A new computerized individual cattle identification system was initiated in 2001. All farmers were encouraged to join the Livestock traceability scheme through the country. Unfortunately, the implementation of program was interrupted because of the FMD outbreaks in 2001.

Vaccination -- In the vaccination zone, vaccination using the trivalent vaccine occurs twice per year (May-June and November-December). Theoretically all cattle in the vaccination zones should be inoculated. Failure to bring all animals for vaccinations is an offence.

Movement control -- Movement permits are required before animals can be allowed to move. They are issued after pre-loading inspection for animals that go for direct slaughter. Animals will be slaughtered only after the transport permits have been handed over to the veterinary personnel at the abattoir. Movement between FMD zones also requires the necessary permits. Permits to move from the buffer zone to the catchment zone will only be issued after animals have tested negative serologically for FMD followed by pre-loading inspection and date-code branding.

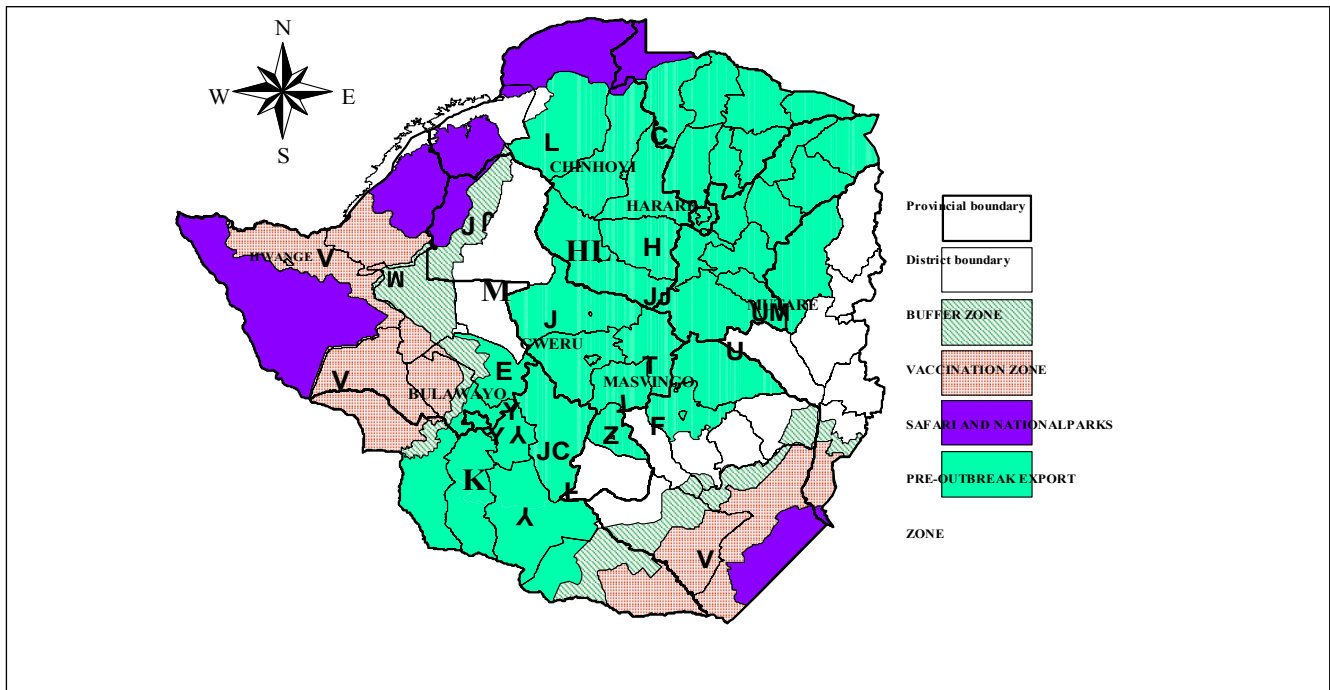


Figure 4: Location of FMD control zones, prior to the 2001 FMD outbreaks, in Zimbabwe.

Livestock traceability and identification – To ensure animal identification and allocation to a specific FMD zone, all Zimbabwean cattle above six months of age are required to have a veterinary brand of their zone/district of origin. Inspections for brands are conducted during dipping sessions in communal areas and during farm inspections in commercial areas. To allow for controlled movement between buffer zone and clear zone, animals from the buffer zone receive a date

Animals within the catchment zone are free to move to any part of the country after being issued with a movement permit. Only when they move to the red zone vaccination before transfer will occur and they will not be allowed out of the red zone except when transported for direct slaughter. During and FMD outbreak movement of livestock is restricted severely.

Surveillance -- The inspection of cattle in communal areas occurs at least every fortnight at the time of dipping. Commercial farms, registered at the District offices, are visited once every three months. Besides the programmed disease surveillance, general surveillance occurs when Veterinary Officers and other veterinary staff are requested to attend to sick animals and when conducting their routine advisory work at farms. Furthermore, animal inspection occurs prior to issuing movement permits and at auction sales. After animals have been inspected, a "report form" is completed. One copy of the report form will be filed at the District Office whereas the other copy will be sent to the Information Management Unit of the Department of Veterinary services.

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