MANAGEMENT OF SAT-TYPE FMD IN SOUTHERN AFRICA: PRESENT CONTROL AND TRADE STANDARDS ARE INAPPROPRIATE

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ABSTRACT

It is argued that international trade standards in respect of FMD in southern Africa could be strengthened to both lessen the risk of FMD being spread through export of animal products while, at the same time, enabling greater diversity of land-use options for the Region. This is important in view of the on-going establishment of transfrontier conservation areas (TFCAs) which will result in larger numbers and a wider distribution of African buffalo in southern Africa. Healthy buffalo populations maintain the SAT serotypes in southern Africa and this situation presently precludes animal products being exported to regulated markets from areas of southern Africa where infected buffalo populations occur. However, transmission of SAT serotypes from buffalo to domestic livestock can be effectively managed. This means that standards could be set that dissociate the FMD status of livestock in a country or zone from that of wildlife, as has been done for other transboundary animal diseases. Combining this with a commodity-based approach could provide the solution to a serious development conundrum facing southern African countries.

1. INTRODUCTION

The three SAT serotypes of foot-and-mouth disease (FMD) virus differ on the basis of genome sequence-based phylogeny from the other 4 FMD virus serotypes (2,5). Furthermore, it is inferred from the ability of African buffalo (Syncerus caffer) and SAT-serotype populations to co-exist in a permanent near-symbiotic relationship that the SAT serotypes evolved in association with African buffalo, i.e. independently of the A, O, C and Asia 1 group which, for some hundreds of years, have been maintained by domestic livestock in Europe, Asia and north-central Africa, spreading to the Americas in the 19th Century. Eurasian serotypes of FMD virus seem not to have not established themselves in southern Africa. Some documented introductions of serotype O and perhaps A via import of livestock or their products from South America and Asia occurred in the 20th Century but these incursions either disappeared spontaneously or were eradicated.

Presently, healthy African buffalo populations — which have become increasingly isolated and scattered in wildlife reserves by human expansion and agricultural development — maintain the SAT serotypes of FMD in southern Africa (5). These viruses infrequently spill over into cattle and result in outbreaks of disease in domestic livestock which are not only disruptive to livestock production but, more importantly, result in a situation whereby trade in livestock and products derived FMD-susceptible animals is severely constrained by the requirement for freedom from FMD of the country or zone of origin as the basis for access to regulated markets (Chapter 8.5 of the OIE's Terrestrial Animal Health Code [the Code], 2007 – www.oie.int). The efforts of official veterinary services of southern Africa are to a large extent devoted to minimizing the likelihood of transmission of SAT-serotype viruses to cattle through vaccination of cattle located near to infected buffalo populations and various forms of movement control, often dependent on fencing. A fundamental consequence of this situation is that SAT-serotypes will not be eradicated from southern Africa in the foreseeable future.

Over many decades the rich wildlife heritage of the southern African Region — the SAT serotypes of FMD are an accompaniment of that heritage — has been in decline for a diversity of reasons but, increasingly, attempts are being made to turn this situation around, a major objective being conservation of the bio-diversity of natural ecosystems. A major initiative in this connection is the transfrontier conservation area (TFCA) movement which aims to expand a patchwork of interconnected conservation areas across the borders of countries of sub-Saharan African countries. Thirteen transfrontier parks and transfrontier conservation areas have been identified in
the Southern African Development Community (SADC) Region. As opposed to discrete transfrontier parks, TFCA s often include national parks, neighboring game reserves, hunting areas, conservancies and communally managed land, i.e. there are usually large numbers of people living within and around TFCA s. Ultimately, more than 1 200 000 square km of sub-Saharan Africa is likely to be incorporated into TFCA s. An objective of this movement is the reestablishment of wildlife migration within and between the TFCA s (i.e. the vision of 'Africa without fences'). A key economic driver of the TFCA movement will be eco-tourism although it is intuitively difficult to foresee how tourism alone will sustain large numbers of people. For that reason, a diversity of livelihood generating alternatives will be necessary in future. The TFCA movement, driven by organizations such as the Peace Parks Foundation (www.peaceparks.org), has significant political, financial and public support. Some TFCA s are now established and functioning so these developments are real, not simply theoretical.

At the same time, other aspects of rural development such as exploitation of the abundant domestic animal resource of the southern African Region, is recognized as being vital for rural development and alleviation of poverty. There are about 70 million small-scale owners of livestock in the SADC Region and most of these are disadvantaged people who see expansion of livestock-based production as an important future economic opportunity. It also needs to be understood that for many of these people cattle are traditionally important in a sociological context.

Co-incident with these developments, southern Africa is not dissociated from wider-scale events associated with the spread of transboundary animal diseases (TADs) such as avian influenza, bluetongue, classical and African swine fever and disease resulting from West Nile virus infection. These infections are maintained and potentially spread by free-living wildlife and it is becoming obvious that climate change and factors associated with globalization are the basis for their geographic expansion. It is consequently often impossible to be sure at any given time where these infections are distributed and where not, even in developed parts of the world. This creates obvious difficulties for the present international trading system for animals and animal products because the latter is based primarily on the requirement for geographic 'freedom from disease' as the primary mitigator of risk associated with such trade (in reality it is the presence of infection, not disease, which is vital). This was the impetus for proposals to introduce a commodity-based approach to trade in animal products, i.e. the concept that the commodity itself and not the area of production, should determine risk of spreading TADs by traded animal products (4). Of course, if geographic freedom from disease and commodity-based standards were to be combined in the management of risk of spreading human and animal infections, the system would be concomitantly more robust.

Countries in sub-Saharan Africa generally and southern Africa more specifically, where livestock production is generally more commercialized, are consequently faced with a conundrum: Conservation of their unique wildlife heritage (of benefit/value to the world at large) will increasingly be penalized by limiting access to international markets for animal commodities. This includes livestock products and those that could be derived from wildlife through a system of sustainable utilization. The present basis for access to international markets for animal products, i.e. geographic freedom from FMD and other TADs is therefore inappropriate for southern Africa.

Present international standards required for recognition of a country or zone (region) as being free from FMD and their effects on southern Africa

It is presently possible for member countries to apply to the OIE (International Organisation for Animal Health which serves as the international standard-setting body for the World Trade Organisation [WTO] in matters related to animal health and trade) for recognition of its whole territory or part thereof (zone) as being freed from FMD (officially, the FMD status of member countries is provided in the form of a 'list' on the OIE website - www.oie.int).

In order to achieve this status, applicant countries need to prove that no outbreak of FMD has occurred in the country or zone for the last 1-2 years (depending on whether vaccination is employed or not) and also that both the domestic livestock and wildlife populations (i.e. all susceptible species) show no evidence of 'circulating FMD virus' for at least a year. In this context it is important to appreciate that African buffalo very rarely, if ever, suffer clinical effects from natural infection with SAT serotype viruses.

It has been demonstrated over many years that it is possible to prevent transmission of SAT viruses viruses from buffalo to cattle by separation of buffalo and cattle populations, primarily through the use of fencing (such fencing also needs also to prevent antelope crossing because they can act as intermediaries in the transmission of FMD from buffalo to cattle) (3,6). Vaccination of cattle kept adjacent to infected buffalo populations provides further protection. It has even proven possible, in the Kasane area of Botswana for example, to protect cattle populations which mix freely with infected buffalo from SAT infection over a 20 year period by vaccinating the cattle every 4 months (M. Letshwengo, personal communication, 2008). Admittedly, this system has broken
down recently, probably due to the inability of the current vaccine to protect against a SAT2
topotype circulating in the buffalo population.
It is therefore clear that the growing numbers and distribution of buffalo implicit in the
development of TFCAs in southern Africa will increasingly constrain livestock production by limiting
access for animal products manufactured in the region to international markets. This will constitute
a significant obstacle to rural development in an area where it is desperately needed.

Could a more appropriate system be devised without increasing the risk of FMD spread through
trade commodities?
It is increasingly accepted by the OIE that the status of domestic livestock in countries or zones in
respect of TADs need not necessarily be influenced by the status of wildlife populations. So, for
example, the status of a country’s poultry industry need not be negatively influenced by the
presence of highly pathogenic avian influenza (HPAI) viruses in wild birds (Chapter 10.4 of the
Code – www.oie.int). Similar considerations are being given to other disease where wildlife may
serve as sources of infection such as classical and African swine fever. This principle is equally
applicable in the context of SAT serotype infections in southern Africa. Such provision would enable
countries to establish domestic animal populations demonstrably free from circulating FMD virus
but without necessarily requiring infected buffalo to be excluded from the country or zone.
Combining the above principle (dissociation of FMD presence in buffalo from the FMD status of
domestic livestock) with a commodity-based approach (also now accepted by the OIE although
specific standards, especially for processed commodities, are still largely in abeyance) for specific
commonly traded products would facilitate trade in defined commodities produced in southern
Africa which present a lower risk for transmission of FMD (and most other TADs-causing infections)
than the present system based exclusively on geographic freedom from FMD in both domestic and
wild animal populations. For example, there is good evidence that de-boned beef produced from
healthy cattle by conventional methods presents an acceptably low risk of spreading FMD and other
TADs (1). If such beef were produced from cattle populations proven free from FMD virus, a safer
trading system than that presently in operation would prevail but, at the same time, enable wider
access to international markets. As a further measure, processing of the beef (i.e. beneficiation)
would provide an additional safe-guard. In this way a matrix of risk-reduction measures could be
applied to ensure safe trade in products derived from animals.

What needs to be done to implement necessary changes implicit in this proposal?

1. The OIE (perhaps through the Regional Commission for Africa) to be requested to amend
Chapter 8.5 of the Code to accept the possibility that domestic livestock populations (cattle
specifically) can be maintained free of infection with SAT viruses even when infected buffalo are
present in the country or zone, i.e. the two species can be effectively sequestered from each
other using physical (e.g. fencing) and/or immunological means (vaccination).

2. Development by the OIE of specific standards for commonly traded products derived from
animals (such a de-boned beef and its derivatives) would ensure that products prepared from
healthy animals according to processes that render the risk of FMD virus (or other TADs-causing
agents) being inadvertently present, acceptably low (i.e. provide an appropriate level of
protection as required by the WTO).

2. REFERENCES

a commodity for which specific standards could be developed to ensure an appropriate level of
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