
Foot-and-mouth disease and market access: challenges for the beef industry in southern Africa

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**Transboundary animal disease and market access:
future options for the beef industry in southern Africa**

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Transboundary animal disease and market access: future options for the beef industry in southern Africa

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How can southern Africa benefit from the global 'livestock revolution'? What options exist for trade given changes in market demand, entry requirements and trade preferences? What veterinary and food safety standards are required for different trade options? What does this imply for disease control and management of transboundary diseases such as foot and mouth? Who are the winners and losers of different scenarios for the future?

These are just some of the questions that policymakers in southern Africa – and beyond – are dealing with. There are no easy answers. The beef industry in the region has been a stalwart of economic development, but do the new conditions of trade and market access and disease dynamics, particularly of foot and mouth disease, suggest new options must be sought?

This working paper series debates these questions, and explore alternative scenarios in four country settings: Botswana, Namibia, South Africa and Zimbabwe, as well as the wider southern African region. Through a combination of detailed research and numerous stakeholder-led dialogues – the research has explored different scenarios for tackling the challenge of foot and mouth disease, relating each to different market access and trade options. The core question has been: what option (or combination of options) makes most sense, given the current context? Different criteria are evident, with often clear trade-offs. The studies asked: which option results in the greatest returns? Which provides benefits to the broadest group of people? And which will be, in the longer term, the most sustainable?

Disease control scenarios have included:

- Zonation and area based disease freedom strategies
- Accepting and managing endemic foot and mouth disease
- Compartmentalisation
- Commodity based trade

Market access and trade scenarios have included:

- Securing EU export trade, including via private wholesaler/retailers
- Looking east – marketing to Asia and the Middle East
- Regional markets in Africa
- Enhancing the value of domestic markets

Research findings have been debated at an international workshop held in South Africa in April 2008 which has sought ways forward for national, regional and international policy. The study has been supported by the Livestock for Life programme of the Wellcome Trust and coordinated by the STEPS Centre at the Institute of Development Studies at the University of Sussex.

Website:<http://www.steps-centre.org/ourresearch/vetscience.html>

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Acronyms

ACP	African, Caribbean and Pacific
ALive	African Livestock: partnership for livestock development and poverty reduction
AU	African Union
BMC	Botswana Meat Corporation
BVI	Botswana Vaccine Institute
CAADP	Comprehensive African Agricultural Development Programme
CBT	Commodity Based Trade
CFU	Commercial Farmers Union
COMESA	Common Market for East and Southern Africa Countries
CSC	Cold Storage Commission/Company
CVO	Country Veterinary Officer
EPA	Economic Partnership Agreement
EU	European Union
FANMEAT	Farm Assured Namibian Meat
FANR	Food, Agriculture and Natural Resources Directorate, SADC
FAO	Food and Agriculture Organisation of the United Nations
FMD	Foot and Mouth Disease
GLOBAL GAP	Global Partnership for Good Agricultural Practice
HACCP	Hazard Analysis and Critical Control Points
IBAR	Interafrican Bureau for Animal Resources
IDS	Institute of Development Studies
IFAD	International Fund for Agricultural Development
ILRI	International Livestock Research Institute
MEATCO	The Meat Corporation of Namibia
NCA	Northern Communal Areas
NEPAD	New Economic Partnership for Economic Development
NFU	National Farmers Union
ODI	Overseas Development Institute
OECD	Organisation for Economic Cooperation and Development
OIE	World Organisation for Animal Health (Office International des Épizooties)
SADC	Southern Africa Development Community
SAT	Southern Africa Type
TAD	Transboundary Animal Disease
TFCA	Transfrontier Conservation Area
VCF	Veterinary Cordon Fence
WTO	World Trade Organisation
ZFU	Zimbabwe Farmers Union

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Summary

Focusing on the case of foot and mouth disease (FMD) in southern Africa – and specifically Botswana, Namibia, South Africa and Zimbabwe – this paper explores the economic, social and political trade-offs arising from different scenarios for gaining market access and managing and controlling FMD in support of beef production in southern Africa.

A central question is: does the current approach, premised on the ability to separate a 'disease free' commercial sector from endemic areas through strictly enforced buffer and surveillance zones and movement control, make sense given new contexts and challenges? Are there other alternatives that benefit a wider group of producers, ensure food-safe trade, and are easier to implement, yet maintain access to important export markets and so foreign exchange revenues? Following an examination of the new contexts of disease dynamics and livestock trade in southern Africa, the paper explores a series of scenarios for market access including: trade with the European Union; direct exports to large retailers; export to emerging markets, particularly Asia; regional trade in southern Africa and domestic urban and rural markets. Given this assessment, the paper then asks: what makes most sense for the control and management of FMD?

In southern Africa arguments for persisting with the status quo have strong and influential supporters. The policy argument for safe trade based on area-based disease freedom and a strict separation of commercial, export-oriented herds from others is rooted in a strong science and policy international network, supported by well-funded and well-connected international institutions and commercial interests and has deep-rooted historical connections, with associated personal and institutional commitments within the region. As such it reflects a particular set of interests and assumptions. These sway national debates about appropriate measures for disease control sometimes blocking out alternative views and perspectives. But there are alternative views, with different implications for policy directions. In this paper we explore four scenarios, in addition to the standard approach, including: export zones with vaccination; compartmentalisation; commodity-based trade and managing FMD for domestic trade. Complementarities and trade-offs between different market access and disease control scenarios are explored, highlighting some important 'win-win' opportunities which have, as yet, not been fully exploited.

The paper concludes that, given the evolving contexts for livestock production, transboundary diseases and trade, a major policy rethink is needed. If the full benefits of the 'livestock revolution' are to be captured in southern Africa, this will require developing new responses and capacities, and abandoning inappropriate and out-dated policy frameworks. The paper argues that a diversity of complementary market access and disease control options will allow resilience to disease events and market shocks to be built and benefits to be more widely shared, as well as a more integrated and coordinated approach at regional level to emerge.

Introduction

The presence of transboundary animal diseases, and the consequent escalating costs of regulation and meeting export standards, are key to the future of livestock production in Africa (ALive 2007; FAO 2005; Nelson 2005; Perry *et al.*, 2005)¹. Much policy concern is focused on meeting the high hopes of a 'livestock revolution' as a spur to boosting stagnant agricultural sector growth (Delgado *et al.*, 1999).

Focusing on the case of foot and mouth disease (FMD) in southern Africa – and specifically Botswana, Namibia, South Africa and Zimbabwe – this paper explores the economic, social and political trade-offs arising from disease control strategies focused on promoting different scenarios for beef marketing and trade. A central question is: does the current approach, premised on the ability to separate a 'disease free' commercial sector from endemic areas through strictly enforced buffer and surveillance zones and movement control, make sense given new contexts and challenges?

The conventional storyline that influences policy thinking holds that FMD-free countries are rich, while FMD endemic countries are not; without resources to control FMD and enter lucrative markets, FMD keeps countries poor, and the benefits of the livestock revolution cannot be attained. This, it is argued, is a vicious circle and one which justifies substantial public investment in disease control and eradication strategies, in order to gain 'disease freedom'. As John McDermott, deputy director general for research at the International Livestock Research Institute (ILRI) puts it, 'FMD is a major obstacle to productivity and market access in many of ILRI's target regions, particularly South Asia, the Horn of Africa and southern Africa. It severely limits market opportunities for poor farmers and nations wishing to access more lucrative markets, both regionally and internationally².

SADCFANR (2003), for example, argue that poor livestock farmers are being excluded from the one livelihood sector they are engaged in with a high potential for growth and that this offers an opportunity for poverty reduction. To increase the quality and quantity of animal production for the domestic market and enter regional and international trade in livestock products there is therefore a need to control and manage FMD, they argue.

However, while these objectives may represent the ideal, the question arises: given limited resources and capacities and growing costs of meeting export standards, does it make sense to persist with an economically and politically fragile status quo and attempt to ensure area-based disease freedom? Or are there other alternatives that benefit a wider group of producers, ensure food-safe trade, and are easier to implement, yet maintain access to important export markets and so foreign exchange revenues?

A number of further, more specific, questions are, in turn, suggested:

- How can 'safe trade' be ensured in disease-endemic areas? Is area-based disease freedom the only option?

¹ http://www.oie.int/eng/press/en_040720.htm.

² Developing-country farmers to benefit from new foot-and-mouth disease 'roadmap'. http://www.ilri.org/ILRIPubAware/ShowDetail.asp?CategoryID=TS&ProductReferenceNo=TS_070417_001. Accessed January 2008.

- Given particular epidemiological, economic and political contexts, how should major investments in disease eradication, control and surveillance be focused?
- What are the distributional and policy implications of different FMD control policies: who wins and who loses, and who should pay?
- What combination of options is likely to be most resilient, given the likely shocks and stresses to the production system, from changing market conditions and disease ecologies?

These questions respond to a series of contemporary policy dilemmas, all high on policymakers' agendas in southern Africa:

- How should animal diseases be managed in the context of expanding wildlife land-uses (and so more buffalo and other game) and redistributive land reform (and so more, smaller land units with mobile animals)?
- Should a country attempt to comply with very demanding and apparently ever-increasing export standards or explore alternative markets and different interpretations of standards regimes?
- How should all this be implemented when veterinary services and regulatory authorities are weak and under-resourced?

This paper seeks to provide some preliminary answers to these questions – or at least a framework for thinking about them. The following sections describe the history of FMD and its control in southern Africa as it relates to the marketing of beef; explore the new contexts that are changing the status quo, sketching potential new scenarios for marketing and disease control; and draw out the challenges for policy makers concluding with a schematic matrix of future scenarios and trade-offs.

FMD history in southern Africa

The high profile and economically damaging outbreak of FMD in the UK in 2007 – coming relatively soon after the 2001 outbreak and its controversial control policy – has returned the debate about the global challenges of FMD control to the international media. FMD has of course not always been such a feared disease. For the UK, Abigail Woods (2004) describes the historical construction of a relatively mild livestock disease as a scourge on livestock trade to be eliminated through 'stamping out' and a range of restrictions of movement of livestock and livestock products. After the disease's first appearance in 1839, FMD control measures in the UK emerged in 1869 when legislation restricting the movement and marketing of FMD-infected animals was introduced in the wake of the devastating 'cattle plague' of 1865–7 and by the early twentieth century stamping out became the policy of choice (Woods 2004). Such measures became established in both law and institutional practice, and became a central tenet of veterinary practice and education.³

These European debates have relevance in Africa, since the colonial veterinary systems were set up very much in line with their colonial originators' visions. Thus British colonies' veterinary policies and practice had a very British flavour – as in southern Africa (Scoones and Wolmer 2006). This approach to FMD control has

³ As shown by the UK government's continued recourse to 'stamping out', FMD' approaches to disease control may have well-established historical roots, and may be more of a response to institutionalised 'tradition' – what we always do – rather than any assessment of appropriateness (Scoones and Wolmer 2006).

been internalised in the World Animal Health Organisation's protocols⁴ and has, as a result, become the international benchmark for standard setting. This zero-tolerance approach to FMD in Europe has created a fundamental problem for red meat-exporting southern African countries where FMD is endemic.

As Thomson (2008 – this series) describes, the 'Southern Africa Type' (SAT) FMD viruses are found in free-roaming buffalo in the region which act as a permanent reservoir host for the disease.⁵ Although there is now a certain amount of understanding of the process of transmission of FMD from buffalo to cattle and other cloven hoofed species, a considerable amount of uncertainty about the precise epidemiology still remains.⁶ The presence of buffalo and SAT viruses means countries in the region must go to considerable lengths to secure EU export contracts.

Southern Africa's livestock sectors and veterinary policies need to be understood in the context of the dualistic livestock economies that became established with settler colonialism. As white settlers alienated land, stock on 'commercial' ranches was increasingly separated from black settlement and livestock.⁷ In Rhodesia, for example, new fencing demarcated this dualistic system, separating top-of-the-range Rhodesian beef geared for export (often using pedigree animals) from 'the rest' – black-owned livestock in the 'communal areas'. These were two very different systems of production, with different management regimes. There were different breeds, stocking rates, range management approaches, and a range of uses for cattle (Scoones and Wolmer 2007). The country's Department of Veterinary Services was also geared primarily to the commercial beef sector – and thus devoted much attention to combating FMD – a disease of key economic importance given its prejudicial impact on exports⁸.

⁴ Export-led livestock systems mean meeting increasingly stringent international standards set according to importing country requirements and the Sanitary and Phytosanitary (SPS) agreement of the WTO (World Trade Organisation) and overseen by the World Animal Health Organisation (OIE). These put an emphasis on the eradication of OIE former List A diseases, the establishment of disease-free zones (or complete disease freedom at a national level), and surveillance of transboundary animal diseases according to criteria and pathways stipulated by the OIE and importing country inspection teams. This, in turn, has significant implications for the on-going processes of restructuring of veterinary services, as well as research and development support to livestock production.

⁵ Less international research has been directed towards SAT virus types than the globally more common O types.

⁶ Understanding of the epidemiology of FMD in southern Africa grew significantly following research largely in South Africa (see for example Thomson 1995; Brückner *et al.*, 2002; Bastos *et al.*, 2000; Vosloo *et al.*, 2002). More recent work has focused on more detailed molecular characterisation of SAT type FMD viruses, highlighting the heterogeneity and complexity of the FMD virus (Bastos *et al.*, 2001, 2003a, b; Vosloo *et al.*, 2006).

⁷ Botswana is a partial exception to this geographical dualism. In Botswana cattle supplies to feed the growing number South African mine and factory workers on the Witwatersand were the reason for earliest European interest in the territory from the late nineteenth century. Cattle from 'native reserves' was either trekked out directly for export, on the hoof or by rail (Hubbard 1986). Today 85% of meat exports are derived from the communal grazing land sector (Perry *et al.*, 2003).

⁸ Prior to independence the visibility of veterinary staff in the communal agricultural sector was close to zero. The veterinary department left that task to the then Ministry of Internal Affairs. Veterinary experts would only surface to issue quarantine orders when outbreaks of specified diseases occurred in communal areas (see Aspinall, 1993; Milton 1997).

As Woods (2007: 17) describes:

‘Stock-free buffer zones were created around settler farms, with Africans confined to set areas where quarantine restrictions prevented them from moving and marketing stock. Animals were periodically inspected, and vaccinated when disease broke out. Those that crossed lines were shot. This system, while benefiting white farmers, served to penalise African farmers for the existence of a disease which they did not perceive as a problem, on account of its low fatality and mild symptoms’.

The very high disease control costs were regarded as justifiable to help establish and then protect a valuable beef export market (Scoones and Wolmer 2007)⁹. These efforts have resulted historically in a reasonable degree of success across southern Africa. With the exception of Zimbabwe post 2000, the colonially-inherited land use systems and the separation of commercial and ‘subsistence’ production in a dualistic system has remained largely intact, and the approaches to FMD disease control have remained largely constant since the 1930s. This has revolved around four integrated activities: separation, movement restriction, vaccination and surveillance.

Separation of FMD endemic areas from free zones by cattle- and sometimes game-proof fences designed to restrict the movement of cloven-hoofed animals [and people] is perhaps most dramatically illustrated by the Namibian Veterinary Cordon Fence (‘red line’) which runs the width of the country separating it into FMD disease free and endemic zones. Only areas south of the VCF are able to access international markets for beef (Bishi 2008 – this series). By 1980 Namibia had over 7000 km of stock and/or game fencing – all regularly maintained and patrolled and intended to constitute physical barriers to movement. In South Africa the Kruger National Park has had a game proof fence since the 1930s to prevent contact with buffalo and Botswana and Zimbabwe are similarly fenced into different colour coded disease control zones. Recently Botswana has controversially attempted to fence its border with Zimbabwe¹⁰. Indeed Botswana is no stranger to fencing controversies, as veterinary cordon fences have long attracted the ire of those concerned with their environmental impact (e.g. EIA 2003).

The *restriction of movement* of cloven-hoofed animals and the animal products derived from them out of and within the areas zoned and fenced off as FMD-endemic is the second generally administered control measure. In the four countries involved in this study, animal movement control is administered through a permit system under authorisation of the veterinary department. It is supported by livestock identification and traceability measures including branding, ear-tags and a networked database (in the case of Namibia) and micro-chipped reticular boli (Botswana’s Livestock Identification and Trace Back System); and enforced with roadblocks.

⁹ See for example, Scoones and Wilson (1988), Mtetwa (1978); Steele (1981) for Zimbabwe.

¹⁰ The fence was announced with great fanfare in 2005, with the Botswana government originally assuring residents along the border that the fence would be electrified, delivering a 220V ‘non-fatal’ shock (see BOPA Daily News Archive, 3 May 2005, www.gov.bw/cgi-bin/news.cgi?d=20050503&i=Siele_assures_residents_fence_will_be_electrified). However, the plan was later abandoned (21 July 2007, Mmegi news - www.mmegi.bw/2006/July/Friday21/10021162311096.html; see ‘Electric Fence a P27 million failure’, FMD News 16 May 2006) due to international protests. Instead, plans now exist for a 10km ‘buffer zone’ along the Zimbabwe border (September 11 2007, BOPA Daily News Archive - www.gov.bw/cgi-bin/news.cgi?d=20070911&i=Govt_plans_FMD_buffer_zone).

The third measure is the *biannual vaccination* of cattle against the SAT-types of FMD virus in proximity to infected zones populated by buffalo. This is done in conjunction with the final measure – the on-going *surveillance* of cattle in endemic and/or high risk areas (Thomson, 2008 - this series). Largely this is based on physical inspection, often conducted at times when cattle are gathered together for other purposes such as dipping against ticks and tick-borne diseases. In Namibia routine active surveillance activities also include farm inspections, community visits, ante- and post-mortem inspections at abattoirs, supervision of livestock auctions, export certification and inspection of imported animals, disease investigations as well as structured sero-surveys in domestic and wild animals (Bishi, 2008 - this series). In South Africa surveillance is carried out by para-veterinary personnel under the supervision of veterinary officials (Moerane, 2008 - this series).

In South Africa and Botswana, when FMD outbreaks have occurred in the designated Free Zone they have been controlled with a stamping out strategy – with the compulsory slaughter of infected and in-contact animals. This is not without controversy, especially over issues of compensation¹¹. As in the UK, this eradication strategy is geared towards maintaining disease freedom status and protecting access to international markets. However, in South Africa since 2000 the control policy has been modified to include ring vaccination (Moerane, 2008 - this series)¹² and in Botswana in 2005 and 2006 vaccination rather than stamping out was required as these outbreaks occurred outside the export zone¹³.

As the disease history for each of the four countries shows, these combined approaches have achieved considerable success over 60 years or so (at least until 2000 in Zimbabwe). Outbreaks have been rare and when they have occurred they have been quickly controlled, and endemism has been contained, and a successful beef export system has emerged. However, this has come at a cost. Recent estimates of Botswana's approach to ensuring traceability (the Livestock Identification Trace-Back System) indicate a cost of P150 million (Stevens *et al.*, 2005)¹⁴. The cost of fencing is huge, with some planned investments in transfrontier conservation areas requiring many hundreds of kilometres of highly expensive fencing. With permit systems, surveillance and spot-checking being so critical, this requires substantial manpower investment from both the veterinary service and police. This has to be trusted and reliable too for it to be effective. And finally, a bi-annual vaccination policy is both expensive (at US\$1.4 per shot for a multivalent vaccine) and time-consuming, as well as logistically challenging, especially with veterinary services running on declining budgets and with reduced capacity. Often veterinary capacity is insufficient to cover areas of hundreds of square kilometres as graphically illustrated by one veterinary officer from a southern district of Zimbabwe who commented recently:

¹¹ Concern at 'shoot to kill' policy in FMD affected areas, and lack of compensation for villagers. 5 July 2007, www.mmegi.bw/2007/July/Wednesday4/31.php. See 'The killing has started'. Mmegi News, 29 June 2006.

¹² In South Africa, FMD outbreaks in Limpopo Province in mid-2004 caused great concern especially as this included some buffer and surveillance areas. A total ban on movement from the quarantine zone was instituted and a vaccination programme launched.

¹³ For example a FMD outbreak was confirmed in April 2006, although exports resumed from the Lobatse abattoir to the EU shortly afterwards in June, but only from selected zones (FMD News).

¹⁴ Foot-and-mouth disease is not the only rationale for implementing such measures. Importing to the European Union, for example, requires traceability because of a range of disease risks. Foot-and-mouth disease, however, has become perhaps the main focus, especially since the European outbreaks from 2001.

'Our control system at ground level has completely broken down... There is little we can do if there is an outbreak of FMD. We cannot even plan a vaccination programme. There is one vehicle for the whole district. It has been grounded for 3 months. There is no transport even if vaccine is available. We can only suspend sales and stop issuing movement permits, but the impact is limited. People just move their animals as they wish without permits, and if they are caught they say they moved during the land reform time. The fences only exist on the map – they are all down. Let's be frank – there is nothing we can do' (Interview, 21 November 2005 – from Mavedzenge *et al.*, 2006: 83).

While the situation in Zimbabwe is of course distinct, the financial, personnel and logistical challenges of ensuring area-based disease freedom in the face of continuous FMD challenge (with a fast-evolving disease ecology and epidemiology) is, unquestionably, an uphill struggle for any national veterinary service. Rweyemamu (2007) estimates that there is one veterinarian for every 15,704 livestock units, compared to one to 390 in the UK. With transboundary disease control recognised as a 'public good', and one with international dimensions, there are of course commitments to provide public (government and donor) funds for such control efforts. Thus, for example, through the FAO, the South African government has been providing support to the Zimbabwean authorities for vaccination and fencing in FMD-endemic zone along the border with South Africa¹⁵. Similarly, the European Union has provided aid support for FMD disease control and eradication to the tune of millions of euros¹⁶. Deriving in large part from international concern around highly-pathogenic avian influenza, international funds have been allocated (although often not released) for increasing the capacity of veterinary departments in Africa to respond to outbreaks. And, often far exceeding any donor support, a significant proportion of the national commitment to veterinary departments is spent on FMD-related control measures.

The big question of course is: is this the optimal use of these limited (and declining) resources, given the many other pressing demands on public resources, even for veterinary issues (e.g. dipping, dosing, diagnosis and basic treatment regimens etc.)? So embedded in the institutional and policy responses of veterinary departments and international agencies, such questions are rarely asked (and almost never in public). But, given the real opportunities of the global livestock revolution for Africa, given the changing market conditions and access requirements for the red meat trade, and given the real challenges of disease control, now is probably the right time to raise such difficult questions. There are no easy and simple answers. Much depends on context and priorities. But what is clear is that the status quo cannot simply be accepted, and alternative scenarios and options need to be discussed.

Marketing histories

During the colonial period the meat industries of southern Africa were the recipients of massive government support in the form of price guarantees for producers and state control of marketing via statutory corporations (see below and: Scoones and

¹⁵ See: US\$10m UN aid programme to assist FMD control in Zimbabwe, FMD News, 18 January 2007 and Zimbabwe to benefit from 12.6m euro grant, The Herald, 30 April 2007, www.herald.co.zw/inside.aspx?sectid=18187&cat=1.

¹⁶ E.g. EU-SADC FMD Programme.

Wolmer 2007; Bishi, 2008 - this series; Sibanda, 2008 - this series). Relatively generous export-orientated marketing arrangements persisted in the post Independence era when in 1985 Botswana, Namibia, and Zimbabwe (all members of the Africa, Caribbean and Pacific group (ACP) – but not South Africa), negotiated a deal with the European Union for export of boneless beef under a generous reduced tariff, preferential access arrangement enabling the payment of premium prices to farmers.¹⁷ Botswana, Namibia's and Zimbabwe's quotas were 18916, 13000 and 9100 tonnes respectively. Zimbabwe's quota, for example, generated around US\$50 million of much-needed foreign exchange each year.¹⁸ However, between 1995 and 2000 none of these countries beat its annual quota – with only Zimbabwe exceeding quota in one year. In the period 1994-2006 Botswana and Namibia fulfilled on average 55 percent and 71 percent of their quota respectively (ODI 2007). Zimbabwe lost its EU market in 2000.

Table 1. Beef Exports to the EU (metric tonnes)

	1995	1996	1997	1998	1999	2000	Quota
Botswana	11966	10373	11851	13012	11518	11140	18916
Namibia	10177	8546	7143	8898	10365	8641	13000
Zimbabwe	10766	6266	7120	6797	6762	7047	9100

Source: EuroStat 1998-2001 (from Chapter 5: Perry *et al.*, 2003)

Under the ACP preferential trade agreements, commercial beef producers gained price premiums (although price parity arrangements existed in Namibia and Zimbabwe). National treasuries gained significant foreign exchange earnings. Costs of compliance, however, fell largely to the state and so resulted in a diversion of resources away from other alternative uses. Given the economies of scale required for exports to external markets to be initiated and sustained it is also largely a small select group of wealthier producers and support industries who are vertically integrated in the production chain that are able to participate at all (Hall *et al.*, 2004; Perry *et al.*, 2005).

However, in recent years the costs of regulation and meeting the export standards demanded by the EU have been ratcheted ever upwards (Hall *et al.*, 2004). Examples include the need to meet EU hygiene and slaughter standards with new abattoir facilities; demonstrate freedom from residues of drugs or other contaminants (Perry *et al.*, 2005); and comply with new packaging standards.¹⁹ The costs of compliance are escalating at the same time as increasing competition from other exporters, particularly in Latin America (notably Brazil and Argentina) whose large volumes push down prices (see below).²⁰

There is increasingly a perception that the stringent standards applied to southern African exporters by the EU, above and beyond OIE standards, amount to non-tariff

¹⁷ The ACP-EU Partnership is also known as the Cotonou Agreement and succeeded the Lomé Convention.

¹⁸ However, unlike Botswana, Namibia and Swaziland, Zimbabwe was able to negotiate a beef export trade with the EU despite never having received formal FMD-free status from the World Animal Health Organisation (OIE).

¹⁹ There has even been recent talk of a 'carbon tariff' being imposed by Europe on imported goods. <http://news.bbc.co.uk/1/hi/world/europe/7201835.stm>.

²⁰ Another escalating cost is that of vaccines. Kolanye and Mullins (2000) calculate that between 1998 and 2000 Botswana spent over 5 million Pula per vaccination campaign, totalling over 10 million Pula a year, with costs increasing 31% over this period. They suggest that a cost-benefit analysis be carried out to justify the continuation of this entirely publicly funded programme.

barriers. Particularly contentious is the stipulation that meat exported to the EU must be deboned even when it comes from areas with OIE FMD-free status (see Moerane, 2008 - this series; Mapitse, 2008 - this series). There is also justifiable confusion as to why – on top of quarantining and routine inspections of vaccinated animals prior to slaughter – a timed process of beef maturation with controlled pH and temperature, alongside deboning and removal of lymph nodes, should not be recognised as adequate for FMD deactivation (Mapitse, 2008 – this series).

This is symptomatic of the weak collective negotiating position of southern African exporters vis-a-vis the EU. For example, there has been a failure to negotiate the export of vaccinated meat (even if deboned) – something that Latin America has successfully negotiated using OIE ‘freedom with vaccination’ status. Indeed, interviews in the region revealed an ignorance of this option amongst many exporters,²¹ although the establishment of a zone on this basis is now being proposed for southern Mozambique (see Thomson, 2008, this series). Also, during the UK FMD outbreak of 2007, the Namibian CVO commented pointedly on the fact that the UK was able to resume exports much faster than the EU would have allowed for Namibia²².

In such highly regulated export markets there is often a distinction in practice between formal policy (which has an opportunity for flexibility and discretion) and the actual practices of inspection and approval, which tend to be much more restrictive. In the EU context these two functions are separated, with the policy division in Brussels and the inspection body based in Dublin. The latitude that some Latin American exporting countries have been allowed until recently has been put down to the good relationships developed with inspectors, and the ability to make use of interpretative flexibility in the policy due to effective lobbying²³. This has proved harder for southern African countries, without the resources and collective negotiating power.

Yet, despite the ever more stringent SPS requirements and the extra hurdles put in the way, the legacy of the settler livestock economies and latterly the ACP agreements is that Botswana, Namibia and until recently Zimbabwe still gear their livestock trade towards the EU export market. The result is that these countries remain wedded to an approach to FMD control directed by the EU. However, contexts are changing. These are having major impacts on markets and their functioning globally. As the next section shows, the long-standing tie-in to the European market – and associated disease control measures – may prove increasingly risky in the (near) future for the southern African beef industry.

New dynamic contexts

A number of developments in recent years have major implications for this existing, rather fragile, status quo. This section traces a range of these political, economic, epidemiological, ecological, technological and policy contexts – exploring how each

²¹ Gaborone interviews, February 2007.

²² Namibia: Top vet upset with EU, *The Namibian* (Windhoek), 25 September 2007. <http://allafrica.com/stories/200709250415.html>.

²³ Until recently when pressure from UK and Irish farmers has forced a switch in stance to Brazilian beef imports in particular, restricting them to a selected number of farms based on traceability criteria (EU restricts Brazilian beef imports, 20 December, FMD News, <http://fmd.ucdavis.edu>).

presents some major challenges for the beef industry in southern Africa, and why, together, they add up to a strong argument for a rethink.

Political contexts: challenges to colonial land use

As outlined above, most FMD control measures such as movement restrictions and – in particular – fence lines date from the colonial era, when they were often implemented with extreme force with cattle shot if they crossed lines illegally. This has left a legacy of resentment to this day. Events in Zimbabwe since 2000 have illustrated the political fragility of strictly enforced dualistic livestock sectors – particularly where overlaid over racial differences (Mavedzenge *et al.*, 2006; Scoones and Wolmer 2007). The recent Zimbabwe story has shown how rapidly things, once assumed to be fixed forever, can unravel. Zimbabwe's FMD control measures have been premised on the ability to separate a 'disease free' commercial sector from endemic areas through strictly enforced buffer and surveillance zones, and movement control. Yet in the context of widespread land occupations then land reform and resettlement the ability to enforce such a dualistic division became increasingly problematic, both in practical and political terms. Zimbabwe's beef sector has changed dramatically in just a few years (see Mavedzenge *et al.*, 2006). Before 2000 an annual average of US\$43 million had been generated from fresh beef and beef related by-products. However, there was a sharp decline of 93% between 2001 and 2002 due to a major outbreak of FMD and subsequent suspension of exports to the EU market (Sibanda 2008 - this series). The disruption to movement control and breaching of veterinary fencing accompanying the land reform programme, lack of funds for vaccines and weakening of veterinary capacity due to economic collapse meant that FMD ran rampant from 2001, cutting off EU markets at a stroke. The financial and political costs of re-establishing the earlier status quo may prove too high (Scoones and Wolmer 2005; Sibanda 2005).

Indeed, in 2007 Zimbabwe's chief veterinary officer stated that the government has shelved plans to resume beef exports to the European Union after Brussels introduced stringent pre-export requirements demanding that all cattle in the country be identified to the farm and dip tank of origin. He stated that ear-tagging was too costly in the current economic crises (Sibanda, 2008 – this series)²⁴. There is also a recognition among what remains of the commercial Cattle Producers Association that the land reform and accompanying changes to the industry are a 'done deal' and the former situation cannot be recaptured, requiring a major rethink of policy and strategy (Sibanda, 2008 – this series).

Zimbabwe's dramatic changes have major implications for its neighbours leading to cross border tensions – particularly with Botswana²⁵. In the first instance SADC is investing a great deal in 'boundary cleaning' FMD control efforts within Zimbabwe

²⁴ Plans to resume EU exports are shelved. FMD News, 7 March 2007
http://news.yahoo.com/s/afp/20070305/wl_africa_afp/zimbabwueufarm_070305105518.

²⁵ From (very) different perspectives, the Botswana and Zimbabwe press have had numerous reports of cross-border antagonisms in the last few years. For example: 'Zim cattle rustlers terrorise Bobirwa residents.' Mmegi Online, 22 November 2006
<http://www.mmegi.bw/2006/November/Wednesday22/2479209671554.html>. The Botswana government confirmed that all cattle from Botswana that crossed the border to Zimbabwe would be shot due to the risk of FMD – 23 July 2007 - www.gov.bw/cgi-bin/news.cgi?d=20070723&i=Look_after_your_cattle_Mfa. And the sources of FMD outbreaks are always hotly disputed, see: Zimbabwe refutes claims of foot and mouth outbreak Herald, 5 September 2007. Dispute with Botswana over origins of FMD outbreak, www.herald.co.zw/inside.aspx?sectid=2852&cat=1&livedate=5/5/2006.

and along the borders (SADC/FANR 2003). But more broadly the political tenability of their own dualistic livestock economies is coming under the microscope.

In Namibia, for example, the political fragility of the FMD control solution is also all too evident, despite the fact that there has been no FMD outbreak since the 1960s, as Bishi (2008 - this series) describes. The country's Veterinary Cordon Fence very visibly separates the Northern Communal Areas from the predominantly white-owned commercial farms to the south. Although 70% of the population live north of the line only the latter group enjoy the benefits of a well-funded veterinary service and access to lucrative export markets. The so-called 'red line' was subsequently used by South African occupation forces to restrict the movement of people and animals, facilitating their Apartheid policy in pre-independence Namibia. With independence in 1990, the fence's apartheid legacy led to immediate pressure for its removal. However, the relocation of the fence to Namibia's border with Angola was made difficult during the years of civil war in that country. Today peace and stability in Angola, the ongoing constraints on livestock marketing in the NCA (high costs, limited market options, low prices, and loss of condition due to quarantine requirements) make it increasingly politically difficult for the government to justify the continued presence of the controversial fence, when the technical mechanisms to deal with the issue are available. This is exacerbated by the fact that the fence constrains land reform opportunities, with limited opportunities for redistribution north of the fence in the communal areas due to land pressure, and restrictions on the movement of stock south of the fence where land is available.

However, shifting the VCF to the Angolan border to achieve OIE-recognised FMD freedom for the whole of Namibia would, of course, come with its own political controversies and trade-offs (Bishi 2008 – this series). Accessing the EU export market would mean considerable changes in traditional livestock husbandry practices at a cost to many producers. Access to water, grazing and stock from Angola would be constrained with farmers having to give up a centuries-old system of transhumance across the border.

The highly visible contrasts in South Africa between the largely white-owned commercial sector and the livestock production systems of the former homelands are similarly politically sensitive (see Moerane 2008 – this series).

Changing markets and trade agreements

With new developments in global markets, Europe (and the old colonial powers) may no longer be the obvious choice of export market. The ACP preferential trade agreements outlined above elapsed at the end of 2007, and negotiations for the terms of their replacement – Economic Partnership Agreements (EPAs) - with regional groupings are belatedly ongoing with the EU pushing hard to get agreements in place for 2008 (Stevens 2007; Meyn 2007a, 2007b)²⁶. The final terms of these agreements are far from agreed, but it seems very likely that any new liberalised regime will be on less favourable terms for the former ACP exporters. Namibia, for example, stands to pay tariffs equivalent to 142% if it loses the current preference, which would potentially endanger the whole industry with meat exporters as the principle victim, facing paying additional duties of €30.76 million per year (ODI 2007; Meyn 2007b). Botswana beef exports to the EU are similarly threatened with the country facing not only the loss of preferences but a discriminatory 'Most Favoured Nation' tariff compared to its competitors in the EU market, with the likely result being the complete cessation of EU-bound exports (ODI 2007; Meyn 2007a).

²⁶ See http://www.odi.org.uk/publications/briefing/bp_june07_EPAs2008.pdf.

However, in late 2007 this threat by the EU to beef exports was the driving factor in pressuring Botswana, and subsequently – with a view to renegotiating certain provisions – Namibia, to sign hurriedly negotiated Interim Economic Partnership Agreements allowing them to continue their preferential access to the EU market until a full EPA is agreed, with completely duty-free and quota-free access, thereby safeguarding EU beef exports for the time being, and a reciprocal – and controversial – commitment to committing themselves to liberalising European imports.²⁷

The other significant development in global beef markets is the intense global competition caused by the massive growth in production and continued growth in South American exports²⁸. Volumes exported far outweigh anything southern Africa can offer²⁹. For example in 2003 Botswana's world market share in beef was just 0.315% (Mapitse, 2008 - this series).³⁰ South American countries are competing with southern Africa for Asian and European markets, but are also exporting to southern African countries such as Angola and DRC, where the region ought to have a competitive advantage.

This growth in supply is complemented by a change in patterns of global demand. The traditional sources of demand in Europe and North America remain, but demands for red meat have expanded in the growing economies of the east (as well as the Middle East), notably China, where annual consumption of meat has risen from an average of 20kg/person to 50kg/person since 1985. This is the motor of the global livestock revolution, which has seen a growth in demand for meat strongly correlated with economic growth. With global GDP growing at around 4% per annum,

²⁷ See 'Botswana: EU to Scrap Levy On Botswana Beef' <http://allafrica.com/stories/200712031942.html>; 'Namibia: Country Happy With EPA Deal -- for Now' <http://allafrica.com/stories/200801230962.html>.

²⁸ For example the Los Angeles Times reported (23 July 2007) – “Brazil's fertile pastures have helped boost output to 9 million tons, making it the biggest exporter. Brazil is now the second-biggest beef producer in the world after the United States, producing more than 9 million tons, up from 6 million a decade ago, compared with about 12 million in the U.S. While the U.S. is a net importer, Brazil's new productivity has been directed mostly at export markets. From a lowly sixth place among beef exporters 10 years ago, with a little more than 300,000 tons, Brazil has shot to world leadership, exporting more than 2.4 million tons last year”. The major exporting companies (Bertin and the Friboi group) in Brazil are investing heavily, see for example: “Brazil Beef Company Bertin To Double Output In Para State”. Cattle Network, 18 January 2007, adding capacity to a number of units allowing a throughput of 5,000 – 7,000 bovines per day. Similarly the government is investing in animal health capacity, such as the US\$15m government investment in a new vaccine manufacturing factory, with a capacity of 60 million doses per annum. FMD News, 23 May 2007 - www.agrolink.com.br/aftosa/not_detalhe_noticia.asp?cod=55275. The state also vaccinated 137 million cattle vaccinated across 15 states in 2007. FMD News, 14 June 2007: www.agrolink.com.br/aftosa/not_detalhe_noticia.asp?cod=56080.

²⁹ For example the Brazilians predicted that exports would rise to 1.67m tonnes in 2008, despite on-going restrictions to Europe. The Russian market being particularly important as a two-year ban was removed in 2007. Markets in Malaysia and China were also being targeted, as well as exports to Chile, Egypt and the EU. A massive total of US\$4.6 billion was earned through beef exports in 2007 (11 December, 2007, see www.mercopress.com/vernorticia.do?id=12124&formato=HTML). Argentina and Uruguay are also major exporters of frozen beef (see www.ers.usda.gov/Publications/LDP/2007/09Sep/LDPM15901/LDPM15901.pdf), with around 500,000 and 300,000 tonnes exported annually, representing around 20% and 60% of domestic production.

³⁰ Also in Botswana the economic fragility of the beef enterprise has been increasingly evident. The Botswana Meat Commission has operated at a loss in consecutive years since 1998/9 (except in 2001) (Stevens *et al.*, 2005).

and with some strong hotspots, particularly in Asia, but also increasingly parts of Africa, many commentators believe the demand for meat is likely to continue to grow significantly³¹. With rising prices (particularly for feedstuffs, given strong demand for grains for biofuels), it is unclear whether such demand will continue to grow at such a pace, and whether this will focus on red meat or other sources of animal-based protein, particularly in Asia. It is also unclear whether the growing demand will result in greater supply in Asia or whether this will be satisfied through imports from outside, including Africa. However, global concern about climate change and the impacts of different agricultural practices may make meat derived from rangeland, rather than intensive feeding systems, a more acceptable product in certain markets and southern African producers may be able to capitalise on this.

Numerous uncertainties of course remain. But what is clear is that the international geography of the global meat industry has changed and, whatever happens, any opportunity for southern Africa will have to, in the long term, be highly competitive, both in terms of quality (and standards) and price if these growing markets are to be capitalised upon.

Changing public and private standards

Public and political concerns about food safety, zoonotic disease transmission and trade in animal products have risen up the agenda in Europe and North America in recent years. For example, outbreaks of BSE have highlighted the dangers to human health of poorly managed production and processing systems, while the continued anxieties about a human form of avian influenza have emphasised the potential dangers of zoonotic diseases (Millstone and van Zwanenberg 2006). Similarly, the impacts of the 2001 FMD outbreak in the UK on farmers' livelihoods and rural economies have been enormous, reinforcing the commitment to preventing the spread of FMD.

While all these issues are of course distinct - with very different consequences and implications - the overall impact has been to increase awareness of animal disease and veterinary issues in policy circles (if not their technical details), and, with this, to emphasise the importance of implementing ever more stringent standards in the name of improving food safety and disease control.³² Major policy foresight exercises have been undertaken on future challenges of disease outbreaks, emphasising the potentials of bioterrorism and public health threats from zoonoses.

Increasingly, it is private standards imposed by retailers which set the trend, as multiple retailers use independent certification systems to demonstrate regulatory compliance and communicate food integrity to their customers and gain an edge on their retail competitors. The global supply chains for the beef industry are complex, involving different chains of suppliers, wholesalers and retailers. But most imported meat ends up on supermarket shelves, and large supermarkets must ensure that this is safe for customers. They therefore will ensure that all steps in the chain are checked, with often highly complex HACCP (Hazard Analysis and Critical Control Points) procedures deployed. Increasingly this involves both harmonised base-line

³¹ See Food prices: cheap no more. *The Economist*, 6 December 2007.

³² The current EU standards for the importation of fresh meat derived from domestic and wild ungulates can be found at http://ec.europa.eu/food/animal/animalproducts/freshmeat/index_en.htm. These exceed even the requirements of the OIE as specified by the OIE Terrestrial Code.

standards such as the GLOBALGAP farm assurance scheme³³ and private label retailer standards built around a defined or discrete supply chain such as Marks and Spencer's Field to Fork or Tesco Nature's Choice in the UK. Most supermarket buyers are not concerned with the disease freedom status of the country of origin, but of the safety of the meat they put on the market, and so most expertise and focus in private standard setting is focused on the product, rather than disease control systems overall. That said, traceability is often a key criterion allowing those retailers at the top of the supply chain ensure that food safety – and increasingly other criteria – are assured. Indeed, particularly in the United Kingdom, labels that tout traceability, organic/natural, socially responsible production, animal welfare and environment credentials are increasingly critical to beef marketing and regaining consumer confidence in the wake of BSE and other food scares and growing public and media interest in food provenance.³⁴

Thus in the global red meat trade private and public (international and importing country/region specific) standards mix to give an often confusing – and sometimes contradictory – set of signals to producers, and their national authorities. Keeping abreast of this fast-moving scene is not easy. New directives are regularly issued, and interpretations of complex requirements may not be straightforward, especially when contradictory and conflicting signals are given. Thus for example formally it should be perfectly feasible to import vaccinated meat into Europe with the appropriate treatment (according to the OIE and EU – see above), although in practice inspectors sent by the EU may require full disease freedom (or strict zonation) and other demanding veterinary standards. At the same time, a European supermarket chain may demand other risk assessment and certification standards, which may not be the same as those required by the European or national veterinary authorities.

Presented with this bewildering, confusing and fast-changing scene, it is no surprise that exporters in southern Africa find it both challenging and frustrating. South American beef-exporting countries have been seemingly better able to negotiate with the OIE and the EU with respect to the flexibility of SPS requirements – successfully arguing for exports with 'freedom with vaccination' status, for example,³⁵ combined with aggressive marketing strategies.³⁶ As many acknowledge, this is less to do with formal compliance arrangements, but more to do with relationships and trust. As several importing authorities in Europe (both public and private) commented: what is

³³ The supermarket led GLOBALGAP (formerly EUREPGAP) is a pre-farm gate benchmarking standard covering agricultural production comprising environmental and labour standards protocols as well as food safety measures. The National Meat Institute of Uruguay has recently raised the bar for southern African producers by launching its GLOBALGAP certified Natural Meat Program for beef and lamb. See <http://www.globalgap.org/>. Increasingly, compliance with welfare and environmental standards are being added as control points.

³⁴ UK based retailers such as Tesco are also starting to explore some form of carbon labelling for its suppliers which will throw up new challenges and opportunities for exporters.

³⁵ See reports from Brazil and Argentina on the expansion of export markets – 'Brazil Beef Exporters To Zero In On Emerging Markets', Cattle Network, 11 December 2006 - <http://www.cattlenetwork.com/content.asp?contentid=90100>; 'Argentina busca reforzar las exportaciones agrícolas a China'. Telam.com, 1 December 2006 <http://www.telam.com.ar/vernota.php?tipo=N&idPub=44960&id=116637&dis=1&sec=1>.

Although overall exports are rising significantly, those to the EU from Brazil in particular – in part because of FMD outbreaks – are declining, see 'EU imports of Brazil beef fall 40%'. The Scotsman, 30 October 2007.

<http://business.scotsman.com/ViewArticle.aspx?articleid=3475290>.

³⁶ See, for example, the marketing campaign for 'Pampas Plains' Argentinian beef. <http://pampasplains.co.uk/>.

key is that we have faith in the systems in place and with the people who are in charge. Clearly, as market options expand – to Asia or the Middle East for example – such challenges expand and become more complex. Thus, for example, in addition to the conventional food safety and risk assessment requirements required by European importers, some alternative markets in Asia or the Middle East require compliance with *halal* systems to satisfy muslim consumers. Building such relationships with diverse marketing destinations, and complying with their differing and often rapidly changing standards, requires establishing long-term relationships, much patience and skilful negotiation.

The changing structure of the southern African beef industry

The beef industries across southern Africa have evolved, as discussed above, through a highly subsidised, state-supported set of interventions. This has occurred across the value chain – from subsidisation of production costs (notably veterinary support) to marketing. Market support traditionally focused on state-run (or later parastatal) meat marketing boards or commissions. In Zimbabwe, for example, the Cold Storage Commission was established in 1936 when the government took over the then failing Imperial Cold Storage Company. Since that time the CSC (later Cold Storage Company) has seen substantial support from the government, but has consistently made substantial losses (Sibanda 2008 - this series). Despite attempts to prop up the now privatised, but partly state-owned, company in the face of wider economic collapse through price control during the past year, the company, nearly everyone admits, is in need of a major overhaul. Many agree the same applies to the Botswana Meat Commission. Despite earlier successes, in recent years, the economic fragility of the beef enterprise has been increasingly evident. For example, the Botswana Meat Commission has operated at a loss for many years (Stevens *et al.*, 2005), although recent years have seen more positive results³⁷.

In Botswana, Namibia and Zimbabwe, particularly following reductions in government support and liberalisation of markets, there has been a growth in privately run supply chains, with a massive growth in private abattoirs and market outlets. In South Africa such a diversified, private sector industry has long existed, reflecting a larger and more sophisticated domestic market supporting a more complex value chain. This is clearly closely linked in with the Botswana and Namibia supplies in particular, and involves multiple processing wholesaling and retailing players.

While some of these new players are geared to the export trade, most concentrate on domestic and (local) regional markets, with state-supported companies facilitating the preferential trade to the EU. However, the basic economics of such a set-up are increasingly being questioned, and with the major shifts in global competition and standards, as well as shifts in preferential access agreements, new options must be sought. Some of the options available for southern Africa are explored below in some more detail.

Disease contexts: changing epidemiology and ecology

Fast-changing disease contexts add to this complexity and uncertainty. As Thomson (2008 - this series) shows, the southern African setting for FMD control is particularly challenging because of the presence of wildlife, and especially buffalo but also antelope (e.g. Bastos *et al.*, 2000; Vosloo and Thomson 2004), which act as

³⁷ Botswana Meat Commission reported profits for the second year running, according to government reports. FMD News, 25 May 2007 - www.gov.bw/cgi-bin/news.cgi?d=20070525&i=BMC_makes_profit_second_time_running.

reservoirs of infection. With the huge expansion of game farming, conservancies in the ranching areas of southern Africa, risks of disease transmission have inevitably increased (Osofsky 2005). Movements of buffalo and antelope into farming areas and resultant mixing with cattle have increased in some areas, particularly where movement controls and fence lines have broken down. The massive restructuring of land ownership that has occurred in Zimbabwe, for example, over the past eight years has resulted in some major shifts in land use and increased possibilities of cattle-wildlife contact in some areas.

Ongoing uncertainties exist about transmission mechanisms of FMD, and the status and role of different reservoirs of the virus in different animal populations. Equally, there is much dispute about the impact of vaccinated cattle in the dynamics of FMD transmission, making the design and implementation of vaccination campaigns contentious (Sutmoller and Olascoaga 2003).

Major shifts in land use and the population dynamics of disease hosts will potentially have impacts on viral populations and their genetic make-up, as evolutionary processes respond. Molecular genomic assessments of SAT (southern African type) viruses have shown huge phylogenetic variation, with a range of different lineages and topotypes existing (Bastos *et al.*, 2003a, b). Across Africa, Sahle *et al.*, (2007) for example identified at least six lineages and 11 genotypes in SAT 1 isolates in the period from 1971 to 2000.

Technological responses: antibody testing, vaccines and drugs

The southern African disease context is clearly very different from that in Europe or North America. Endemic conditions, wildlife carriers, rapid viral circulation and evolution, among other factors, make the development of technological responses – whether testing kits, vaccines or drugs – particularly challenging. Unfortunately most scientific effort has been invested in developing technologies for non-African, non-endemic contexts. While testing of non-structural proteins is possible to differentiate vaccinated and non-vaccinated infected animals (Clavijo *et al.*, 2004; Kitching 2002; Brocchi *et al.*, 2006), and mobile field-testing PCR kits have been developed³⁸, these options are often too expensive or too lab-intensive and laborious for standard application. There is also a question-mark over whether commercially available kits are sensitive enough for application in SAT-type virus contexts.

Vaccination presents a particular challenge. As Perry and Sones (2007) point out, developing countries where FMD is endemic require vaccines that promote long-lasting immunity, even when coverage is patchy. Such vaccines need to be thermostable and less reliant on a cold chain, given the likely available infrastructure. And, of course, they need to be affordable for cash-strapped veterinary services, if mass vaccination is to occur regularly. A prophylactic strategy in an endemic setting requires a very different set of technological responses to dealing with an outbreak in a FMD-free area, where the imperative is to block the spread of infection, requiring high potency and short-lived immunity.

³⁸ Currently there are three mobile PCR machines now available commercially: the RAPID and RAZOR from Idaho Technology Inc. and the Smartcycler from Cepheid Inc. These each cost between \$50-80000. Others are in development – see for example the discussion of a US\$1000 device under development which is reputedly ‘the size of a portable television’ <http://www.un.org/apps/news/story.asp?NewsID=21907&Cr=bird&Cr1=flu>, but unlikely to be available in any endemic FMD area in Africa any time soon.

In southern Africa vaccines are available commercially through the Botswana Vaccine Institute (BVI). These are currently conventional (non fully-purified) vaccines, with variable efficacy (although the new BVI plant under construction will produce purified antigens). But keeping up with the fast-changing antigenic characteristics in the region is a major challenge, and some researchers have looked towards recombinant vaccines as an alternative (van Rensburg and Mason 2002). However, these remain under development, with questions raised about their thermostability. While there are some initiatives which are beginning to respond to these challenges (e.g. Grubman 2005), these remain limited.

Competing policy goals: beef or wildlife, both or neither?

Alongside these changing political and economic contexts a new policy agenda is further complicating the traditional EU-export based livestock focus in southern Africa and its attendant veterinary regimens. This is the move towards wildlife management which has increasingly been positioned as an alternative sector to cattle in southern Africa. In particular, recent years have seen the roll out of a network of high profile Transfrontier Conservation Areas with a range of economic and political rationales alongside their conservation goals (Duffy 2000; Wolmer 2003; van Ameron and Buscher 2005). The idea – although this has not yet always translated into practice – is that contiguous protected areas in neighbouring countries will be joined with internal fences removed to allow the free movement of large migratory animals (and tourists) and establish ecosystem connectivity in the landscape.³⁹

However, re-establishing ecosystem connectivity and animal migration clearly has implications for veterinary control policy. As some advocates for TFCAs recognise: 'corridors themselves, designed to (re)connect protected areas, can serve not only as biological bridges for wildlife, but also for vectors and their pathogens – so thorough assessments of disease risks should be made *before* areas with potentially different pathogen or parasite loads are joined.' (Osofsky *et al.*, 2005: 74).⁴⁰

Yet TFCAs have built up a political head of steam and policy momentum in southern Africa and have begun to be rolled out in the absence of veterinary policy frameworks (see SADC biodiversity strategy).⁴¹ This development hugely complicates southern African countries' attempts to protect disease freedom status which is potentially jeopardised by the cross-border movement of buffalo in particular, and adds a further layer of political contentiousness to efforts to fence borders and establish zonal controls. Practically speaking, disease freedom status is not possible under this

³⁹ In Botswana, in particular, habitat fragmentation, caused by 'indiscriminate' use of veterinary fencing without considering connectivity and vital linkages between ecosystems has long been a cause of concern amongst conservationists (Osofsky *et al.*, 2005). However, wider political issues may, in the end, dominate. See, for example, Botswana president, Festus Mogae, indicated peace parks between Botswana and Zimbabwe 'on ice' because of FMD situation. 21 September 2007 - www.swradioafrica.com/pages/peacepark210907.htm.

⁴⁰ Vosloo and Thomson (2006)

http://www.wcsahead.org/gltfca_march2006/minutes_6thmtg_gltfca.pdf

'What is new is that novel topotypes of SAT viruses were introduced into south-eastern Zimbabwe in the 1980s -1990s by translocation of buffalo from the north of the country. Depending on how efficiently these new topotypes propagate within the buffalo population of the GLTFCA, the control of FMD through vaccination could become more complicated. Thus research is urgently needed to understand to what extent these topotypes are still present in the Gonarezhou and possibly more widely.'

⁴¹ When veterinary issues have been considered (e.g. the AHEAD 'One Health' approach) they have tended to focus more on the danger to wildlife from alien pathogens than the livestock disease risk.

scenario, although some form of demarcated export livestock compartments and wildlife zones with minimal veterinary restrictions might be (see below).

Constrained capacity of veterinary departments

Disease control systems, particularly of transboundary diseases such as FMD, require well-functioning, well-funded veterinary services that can respond effectively and efficiently to disease outbreaks and maintain systematic, cross-border mechanisms of surveillance and reporting. These capacities are under increasing threat in southern Africa, as veterinary services have been down-sized and restructured, and as other priorities beyond the traditional support for the established commercial sector are pushed up the policy agenda (Gauthier *et al.*, 1999; Perry *et al.*, 2002). Some have argued that recent experience in the UK has shown that even the relatively hugely well funded Department for Environment, Food and Rural Affairs has inadequate FMD diagnostic and laboratory facilities for FMD⁴².

Thus due to these changing political, economic, market, disease and technological contexts, the southern African beef industry faces some major challenges. This suggests, in turn, the need for some serious, hard-nosed thinking about both market access options and disease control strategies. The following two sections present a series of scenarios or options for each, with an assessment of how these might be combined in the future for different contexts. These in turn have some major implications for regional policy issues, a subject which we turn to at the end.

Scenarios for market access

How should the beef industry respond to these fast-changing contexts? These changes in contexts suggest a diversity of market access options, looking beyond the standard responses. In the following section, six potential scenarios are presented. These are of course not mutually exclusive, and indeed for most settings must be approached in parallel. But the questions we posed at the beginning of this paper must be asked of each: which options give the best returns? Who wins and who loses from each option? And, given changing contexts, what is likely to be the most resilient option (or combination)?

A) Export to the EU

This is the threatened status quo that we have discussed extensively above. It is, however, important to note that if the interim EPA translates into a more permanent deal for Botswana and Namibia the favourable terms for their European exports will be extended and even partially improved upon. Indeed, during 2007 imports of beef into the UK from Botswana and Namibia increased by 84% and 34% respectively as they were able to take advantage in a downturn in Brazilian, Argentinean and Australian imports (down 12%, 32% and 39% respectively (NFU 2008)). This loss of market share from the major beef suppliers can be attributed to a variety of factors that include national herd contraction due to low profitability within the Brazilian beef sector; Australian droughts which have hit productivity; and government intervention in Argentina that has limited export opportunities in order to fulfil domestic demand and curb rising prices. Following lobbying from domestic producers, the EU has also recently restricted imports of Brazilian beef, citing FMD risk in the light of failures in

⁴² See <http://www.warmwell.com>.

the country's traceability systems⁴³. Clearly circumstances underpinning world beef supply can change fast, providing short-term opportunities for some.

B) Direct export to large retailers

With the ongoing growth of multinational retailers a range of new and critical policy actors and processes have entered the stage. As discussed above, increasingly it may not be formal, public policy (made by governments and international bodies) that matters in the future. The commercial strategies of the private sector, especially large global retailers (Tesco, Walmart, Carrefour etc.) will be of increasing relevance to the southern African beef sector.

There are several implications of this trend. One is that supply chains are becoming increasingly concentrated and vertically integrated. These supply chains may offer security of supply for producers, although producer prices may be squeezed with profits being reaped mostly at the retail end in intensely competitive retail markets. Also these supply chains might further reduce market access to smallholder livestock producers. In southern Africa access to these international markets has to date been constrained due to poor marketing links, lack of volume, and quality issues, as well as competition from alternative large-volume suppliers in Latin America. Relationships between suppliers (farms/abattoirs) and international retailers (e.g. European supermarkets) are relatively under-developed.

Within the region private sector retailers are, however, becoming more important players. There have been exports to South African retailers through connections between regional abattoirs and supermarkets, but these can be upset by changes in national policies (e.g. export levies from Namibia). Cross-border regional coordination of supply chains within southern Africa remains weak, with high transaction costs (border controls, customs/excise, export levies/duties etc.). The capacity (and incentives) of large suppliers (including parastatal abattoirs) means that negotiations with suppliers – regionally and internationally – to advantage producers is limited.

A second implication of the growth in power of large retailers is the proliferation of private and proprietary standards and assurance schemes for particular retailers (see above) or established by producers seeking to cultivate niche markets for high value-added products. Emerging southern African meat assurance and branding exercises include Farm Assured Namibian Meat (FANMEAT) which is a means of marketing free-range, hormone-free beef with guaranteed gold-plated veterinary and animal welfare standards⁴⁴. There are also starting to be attempts to build on the region's wildlife-rich reputation to develop green certification value-added schemes such as the recently shelved attempt to by Namibia's MEATCO to market 'cheetah-friendly beef'⁴⁵.

National and international regulatory frameworks have been slow to respond to the growing importance of private standards. In a recent submission to the World Trade Organisation, the OIE highlighted "serious concerns about the potential for private

⁴³ <http://news.bbc.co.uk/1/hi/world/americas/7218965.stm>.

⁴⁴ The FANMEAT scheme's ability to persuade importers of the 'superior' nature of Namibian beef might account for the fact that Namibian market share in the EU has grown faster than Botswana's (Stevens and Kennan 2005). Although most Namibian meat imported by the UK is used in the UK the high welfare FANMEAT brand is of interest to supermarket chains too (Bowles *et al.*, 2005).

⁴⁵ <http://www.economist.com/na/content/view/full/859/33/>.

standards to have trade limiting and trade distorting effects”. By contrast, other government bodies appear to accept their importance and, in the case of the UK’s Department for International Development and Department of Environment and Rural Affairs, they have “agreed work together with private-sector standard-setters, as we do with the public regulators, to increase opportunities for small-scale and poor farmers to meet their standards”⁴⁶. What is clear – whatever the pros and cons – large-scale retailers will remain an important influence in market chains and in standard setting, and positive and constructive engagement, on behalf of producers in Africa, will be critical, including the development of new aid instruments to encourage supply chains to do more for development⁴⁷.

C) Export to emerging markets, especially in Asia

As discussed above, demand for meat products from rapidly expanding economies in Asia, (particularly China) is growing at a rapid rate as populations become more affluent and diets change. This clearly offers opportunities for meat exporting countries. These are increasingly competitive markets, where bilateral deals based on political connections may be fairly transient in the face of global competition. While SPS requirements currently appear less than the EU, for example, trends are continuously upwards, and EU and private retailer standards are seen as the benchmark. For Middle Eastern and some Asian markets additional requirements for *halal* compliance are also required, meaning additional costs in abattoirs, as well as inspections. Some interpretations of *halal* standards mean that farm level production systems must be compliant, with no pigs being part of the system, for example.

With the high costs of entry into EU markets, and the decrease in preferential trade options, such markets may be the main high value export market of the future. Winners, however, may be few and temporary given the volatility of such markets. While ‘solidarity’ trade with China or Malaysia, for example, may offer temporary outlets, these may not last (e.g. Zimbabwe’s ‘look east’ policy)⁴⁸. Re-gearing industries to such markets may be costly in the long run, and flexible lower-cost options compatible with lower value markets (possibly based on commodity-based trade or compartments – see below) may offer a good strategy.

As with the multinational retailers, currently there is only limited capacity in southern Africa to negotiate trade agreements with diverse markets in Asia and the Middle East. Parastatal marketing authorities such as the CSC and BMC are simply not geared up for this. Existing export arrangements with Asia are often very ad hoc national efforts, and not backed up by systematic support at a regional level. Competition between regional states exists across these markets, with poor coordination, lack of information, and high costs involved.

⁴⁶ See Considerations relevant to private standards in the field of animal health, food safety and animal welfare, Submission by the World Organization for Animal Health (OIE). G/SPS/GEN/822, 25 February 2008, Para 14 and DFID/DEFRA submission on agricultural product standards, September 2006.

⁴⁷ For example, the establishment of ‘challenge funds’ (www.challenge.funds.org): for example the Business Linkages Challenge Fund (BLCF) supported by DFID.

⁴⁸ See: Zimbabwe clinches Hong Kong export deal. FMD News 3 July 2007 - 6500 tonnes shipped to Hong Kong, <http://www.africa-interactive.net/index.php?PageID=5078>; Lucrative deal struck with Hong Kong FMD News, 14 December 2006 - <http://allafrica.com/stories/200612130455.html>; CSC set to strike a deal with Malaysia. 5 January 2007 – <http://allafrica.com/stories/200701040449.html>; although there remains skepticism in some quarters about the strategy; see - Look east policy yet to bear fruit. 27 April 2007 - www.ipsnews.net/news.asp?idnews=37523.

D) Regional trade, within SADC – and beyond

Considerable opportunities exist for improving trade with the SADC region, matching supply with demand and reducing transaction costs of such trade. Potential exists for considerable gains for a diversity of producers across different markets and products (from high end cuts to low end meat). Importing countries include South Africa and Angola; and outside SADC but nearby, the DRC.

The growth in demand for meat in the region (and beyond in Africa more generally) suggests some positive market opportunities, and, potentially, a shift to higher value products as incomes increase. The demand for meat from Angola, for example, is a good case. Bolstered by rising oil revenues and a growing and increasingly wealthy urban elite in Luanda, demand (and prices) is high. Imports from Brazil as well as the southern African region have increased. Namibia in particular has benefited, but so too have other countries in the region, including Zimbabwe. However, the recent outbreak of FMD in Namibia has resulted in a cessation of formal trade to Angola, as the country imposed a blanket ban on imports.⁴⁹

Regional trade, however, remains fragmented and uncoordinated, and many of the scale and integration potentials of SADC or COMESA, for example, have yet to be realised. Regional integration of production and marketing systems (e.g. from weaner production to feedlots to supermarkets) could be enhanced, lowering transaction costs, and so improving producer prices and offsetting low cost competition. Currently many barriers exist, reinforced by bilateral agreements with other exporters and divergent approaches to export/SPS issues. For example as Moerane (2008 – this series) comments:

‘The SADC member countries have different approaches and compete against each other for the overseas markets. The different systems used leads to outbreaks in other countries posing a threat to their neighbours. There is no common approach towards movement of livestock commodities and this restricts trade within the region.’

Investment in regional trade coordination remains weak, but can be enhanced by a focus on customs deals, removal of trade/tariff barriers (e.g. levies and duties), regional SPS agreements based on agreed certification processes, and investment in infrastructure including cross-border transport networks.

E) Domestic urban markets

Local markets are important, vibrant and growing (with urbanisation, more middle class) – local livestock revolutions. As urbanisation continues, and in most countries outside Zimbabwe currently, the spending power of a growing middle class increases, the demand for red meat (of increasingly higher quality) expands. An increasing sophistication of domestic retailing through supermarket chains requires higher quality and improved food safety conditions. This growing market exists parallel to the still dominant market for beef which is low quality and cheap, with as yet limited requirements for high level food safety certification and risk assessment.

⁴⁹ See: ‘Angola: Government Bans Meat From Namibia’, Angola Press Agency (Luanda), 28 November 2007, <http://allafrica.com/stories/200711281111.html>.

In the cases of Botswana and Zimbabwe the declining capacity and inefficiencies of the controlled parastatal markets (via the BMC and CSC) is also contributing to this shifting in the pattern of marketing – with a move towards private sales and local abattoirs/butcheries (see Mavedzenge *et al.*, 2006). Small-scale farmers producing relatively low quality beef can benefit from this market, providing low cost supplies for a growing demand. Increasing food safety/SPS requirements at the margins to assure consumers and to allow supply to more integrated, and longer, supermarket-dominated supply chains may reap significant benefits for a large number of producers. The emphasis on export – particularly to high value markets – in national and regional policy discussions detracts from a focus on improving domestic markets and responding to shifts in market organisation and consumer demand. This may be an important low-cost option, focused on maintaining basic food safety and public health.

Here, different policy issues arise. What are the basic requirements for assuring food safety and public health in domestic markets in the region, given changing market structures and consumer requirements? Does the capacity exist to respond? And who are the likely responsible authorities? These issues have been barely addressed, either at national or regional levels, and the opportunities of tapping into growing domestic markets have yet to be fully exploited.

F) Local markets in rural areas

Significant sales from small-scale producers are of course very local, either through local slaughter or through networks of local butcheries based in rural service centres and small towns. Despite often elaborate national legislation governing such trade, it is rarely implemented, and if so in a rather ad hoc manner.

In Botswana, for example, local butcheries have in recent years gained market share over the BMC, taking an estimated 60% of cattle sold in early 2007.⁵⁰ In Zimbabwe the shift has been an extreme one, with CSC having 90% market share in 1990 and only 4% in 2006 (Mavedzenge *et al.*, 2006)

Local marketing, processing and sales provide a good route to generating local economic growth, with less likelihood of price fixing through monopoly control of supply chains and significant multipliers at a local level. Intense competition in the sector encourages price stability, which is good for both producers and consumers (see Mavedzenge *et al.*, 2006).

National policies barely touch this area, except for the (sometimes rather arbitrary) imposition of health and safety regulations which are often based on very out-dated colonial legislation. Food safety regulations need instead to be appropriate to this context and not undermine the market. Policy support to such local marketing systems might focus on information systems, credit support, infrastructure upgrading and suchlike.

Scenarios for disease control

Given these different market access scenarios, what disease control approaches make most sense? The status quo of aiming for area-based disease freedom has long been assumed to be the only option. It certainly has many merits, but, as

⁵⁰ With the remaining 40% going to the BMC (estimated 15% to South Africa and 25% to the EU). Interview, BIDPA, 9/2/07.

discussed, many costs and substantial risks. The key question today is whether the changing contexts outlined above, combined with limited available resources and capacities of national and regional veterinary authorities, require a shift from the long-assumed standard response.

Across southern Africa, a key question for policymakers arises: does it make sense to persist with the status quo, buttressing often failing commercial systems in the face of growing costs to meet export standards, and ensure disease freedom? Or are there other alternatives that benefit a wider group of producers, are easier to implement, yet maintain access to important export markets and so foreign exchange revenues? These questions are not easy to answer: there are clearly complex trade-offs involved. Different options may have different returns, costs and risks associated with them, and what makes sense will depend on wider questions of policy and politics.

In southern Africa, as the country case study papers show, arguments for persisting with the status quo have strong and influential supporters. The policy argument for safe trade based on area-based disease freedom and a strict separation of commercial, export-oriented herds from others is rooted in a strong science and policy international network, supported by well-funded and well-connected international institutions and commercial interests (see Scoones and Wolmer 2006), and, as discussed above, has deep-rooted historical connections, with associated personal and institutional commitments within the region. As such it reflects a particular set of interests and assumptions. These sway national debates about appropriate measures for disease control, sometimes blocking out alternative views and perspectives. But there are alternative views, with different implications for policy directions. Here we explore four of these, in addition to the standard approach.

Again, as with the market access scenarios, these disease control options are not mutually exclusive. Different options could easily run in parallel, in the same or different parts of a country. But, again, there are trade-offs between them – in terms of costs of implementing them, in terms of the risks they present, and in their likely efficacy in assuring safe trade in the longer term.

A) Export zones with vaccination

The recent OIE acceptance of a 'with vaccination' scenario offers more flexibility, and changes the balance of costs/benefits, as exports can continue after an outbreak if vaccinations are carried out. On-going vaccination in buffer areas still allows the opportunity for export. As Thomson (2008 - this series) describes, however, it is also technically involved and expensive. It requires two vaccinations for all cattle per annum which is expensive (over \$1 per dose, plus substantial costs of delivery) and the moratorium on exports post outbreak is longer than if a stamping out policy is used.

In areas where FMD outbreaks are inevitable and livestock production for sale is the only sensible land use option, this may offer a good alternative if accepted by importers⁵¹. It requires intensive and sustained vaccination coverage combined with surveillance and between-zone movement controls. The winners are the range of commercial livestock producers and the losers are poorer livestock owners who are obliged to vaccinate and comply with strict movement controls, but do not sell frequently. The regional coordination of vaccination supplies and monitoring of field

⁵¹ See Scudamore (2007) for a commentary on consumer acceptance of vaccinated animals.

level topotypes is critical to ensure effective vaccination and regional regulatory mechanisms for vaccination would be required to ensure continued efficacy.

Vaccination has long been a controversial subject with a number of scientific uncertainties and controversies in the Southern African context (Thomson 2008 - this series) which are exacerbated by the lack of purified vaccine and of capacity (as in the UK) to differentiate between infected and vaccinated animals through simple NSP diagnostic tests, and some importers are still sceptical of the 'with vaccination' option.⁵² Thomson (2006) also warns that:

'Vaccines against FMD in use presently in the SADC Region are not as effective as they have been in the past and may not be adequate to control FMD adequately in future. The precise technical reasons for this situation are not clear but two are most likely: (1) the quality of vaccines produced has declined in the last few years or (2) the antigenic relationship between vaccine viral strains and viruses circulating in the field may no longer be adequate.'⁵³

In this context the ongoing roll-out of transfrontier conservation areas and attendant wider distribution of buffalo populations will heighten the vaccination challenge. As Sibanda (2008 - this series) also points out there have been concerns about the efficacy of the SAT2 vaccines manufactured at the Botswana Vaccine Institute in 2006-7. Indeed, the BVI has effective monopoly control of the SAT vaccine market and lacks price competition and regulation (Thomson 2008 – this series).

B) Compartmentalisation

Compartmentalisation entails the creation of mini-zones at farm level, requiring intensive compliance with fencing (multiple fencing for game), quarantine (camps outside the farm for movement in), traceability (from origins to farm and to destination) and biosecurity (of compartment unit) and hence high levels of investment. These measures allow for compartments (farms or groups of farms) to be created to comply with stringent export requirements to high value markets (e.g. EU, US). Southern African countries have some experience in establishing relatively bio-secure compartments with the history of double-fenced wildlife conservancies. In the African swine fever control zone double-fenced compartments have been used successfully for pig farming in the region. However, such a high cost system is reliant on gaining high value for the final product and so effectively requires premium export markets to warrant the investment (Sibanda 2008 – this series).

Compartmentalisation allows flexible opportunities, even in the face of wider challenges of disease control. Regional coordination should be less of an issue, as it allows individual enterprises to invest in achieving high value market access in the absence of wider regional/national efforts. Theoretically it is compatible with wildlife-based land use options, although costs of biosecurity would inevitably increase. It is an option for high value producers who can invest in the full set of measures at a farm (or group of farms) through outgrower arrangements. It requires private investment, with state veterinary oversight and approval/certification. It requires

⁵² These uncertainties centre on the roles of wildlife (and especially buffalo) as carriers, and their role in FMD transmission, particularly given the huge expansion of game farming in the ranching areas of southern Africa (e.g. Condy *et al.*, 1985; Bastos *et al.*, 2000). Second, questions remain about control measures and their efficacy. The impact of vaccinated cattle in the dynamics of FMD transmission is not completely understood, making the design and implementation of vaccination campaigns contentious (Sutmoller and Olascoaga 2002).

⁵³ Thomson (2006).

negotiations between individual enterprises (compartments) and importers. Owing to the substantial private investment required it is likely to exclude of poorer producers.

OIE discussions on compartmentalisation are ongoing, but questions have been raised about its applicability to FMD due aerosol transmission risks, which may differ in Europe and southern Africa. As Thomson (2008 - this series) points out: 'It seems that recognition or accreditation of 'compartments' will not be a service provided by the OIE but will result from bilateral negotiation between trading partners following guidelines provided by the OIE.'

Questions remain about the extent to which importers (countries or retailers/wholesalers) are geared up for a compartment approach for southern African beef markets; and whether a model developed principally for the pig and poultry sectors can be adapted for beef. Equally, there exist challenges of certification, in contexts where veterinary authorities have limited capacity or are not fully trusted by importers to guarantee high standards.

C) Commodity-based trade

An alternative scenario for disease control discussed in detail by Thomson *et al.* (2004; see also Thomson 2008, this series) is on achieving access to markets via a commodity-based approach, whereby specific animal products are tested for food safety, rather than aiming for area-based disease eradication. The logic runs that in practice FMD outbreaks are to be expected periodically in southern Africa so it makes sense to focus in a more nuanced way on food safety in parallel to veterinary issues. Basic meat treatment (such as pH drop with de-boning) at an HACCP certified abattoir should be sufficient to guarantee destruction of FMD virus should this be accidentally present. This requires building this capacity for food safety certification in selected abattoirs.

Potentially this is a win-win scenario – commercial producers can continue to produce for high value markets, while the costs of veterinary provision are not as extreme as when trying to achieve complete disease freedom. Also it means that there is scope for more added value in the processing of finished products – including de-boning, tinning or marketing of farm- assured produce, which should also provide further employment. The commodity-based trade option may be particularly important for poorer producers who may not be able to comply with other trading standards, but still may be able to benefit from the marketing of particular commodities at premium prices through the application of commodity-based quality and safety standards.

Such a system, however, has certain market entry requirements – in terms of assurance schemes, food safety, processing, branding and so forth. It also requires a certain level of negotiation capacity vis-a-vis importers as well as a degree of regional coordination to facilitate this negotiation and coordinate certification. Independent bodies at national and regional levels (rather than national veterinary authorities) would be probably be required by importers to guarantee food safety.

D) Managing endemic FMD for local trade

The final scenario is in some respects the simplest and is de facto what happens in much of Africa – that of managing FMD outbreaks as and when they occur and focusing on local trade rather than exports. Given that buffalo are prevalent in southern Africa, FMD can be expected to be endemic – the focus for livestock

managers should therefore be on resilient indigenous stock. This is a low cost option benefiting mixed crop-livestock farmers (largely poorer farmers). It would be compatible with a move to more wildlife production, including transfrontier conservation areas. The losers are more commercial livestock producers who would no longer be able to access premium export markets, unless compartmentalisation for FMD is accepted by importers and producers who wish to export are prepared to make the necessary financial commitment to that system.

This scenario is appropriate to countries and regions where mixed farming dominates (Zimbabwe, northern Namibia, the former homelands of South Africa), but does of course present veterinary risks to other areas – raising issues of containment, transboundary movement and surveillance. The question this poses is whether such a scenario can exist alongside others at a reasonable cost?

Challenges for policy in southern Africa: time for a rethink

In the past there has been limited 'policy space' for Botswana, Namibia, South Africa and Zimbabwe, as well as across the region at SADC level, for a thorough-going discussion of beef marketing and trade options and the attendant veterinary regimes. As discussed, the framework for debate has to date been dominated by European concerns, reflected in turn in the 'international' positions of the OIE, Codex, WTO and other standard setting bodies and development agencies. These positions are informed by the narrative that FMD is a 'biological time bomb' and its control is vital, almost at all costs. At the national level, particularly currently in Botswana and Namibia, there has been a focus on exporting at all costs, with EU beef exports being essential for national economies. At the regional level there has been a lack of regional integration and capacity – from broader SADC-wide trade integration to African political and policy influence on the OIE and other bodies. The African Union – and the NEPAD/CAADP framework for agricultural development – offer some important potentials for leadership, but questions of capacity and coordination, particularly around livestock institutional and policy issues, remain an issue, despite the important on-going work of AU-IBAR.

But standing still is not an option. As this paper has shown political, economic, technical and policy contexts for livestock policy in Africa are changing very fast - and new opportunities are opening up. These suggest, in turn, some fundamental new challenges to the status quo assumptions that have dominated policy thinking and practice for decades. These require thinking outside the box – beyond the traditional divides between production, animal health and trade, for example, to a more integrated view. Responses to transboundary diseases are a choice, not a given – trade-offs have to be weighed up, costs and benefits need to be assessed, and the poverty and equity impacts of each have to be evaluated. As the paper has shown, these choices are not straightforward and are highly context-dependent, reliant on particular national circumstances and local political choices about development trajectory.

It is essential, therefore, to go back to basics and ask: what veterinary control measures make sense for what types of development objectives. As Perry and Rich (2007: 238) note in a recent paper:

'FMD control can be an important component of poverty reduction strategies for livestock enterprises of many – but not all – developing countries, depending on the competitive advantage held by the country in livestock resources, on the potential for engagement in export markets for livestock

products, on the role of livestock in livelihoods, and on the importance of FMD relative to other diseases.’

In other words, FMD control makes sense in some settings, but not in others. The sometimes convoluted justifications for FMD control efforts – without questioning what these might entail and examining different options – are, in this light, less than convincing. A detailed examination of the Zimbabwe situation a few years ago is a good case in point (Perry *et al.*, 2003), but, as we have observed before (Scoones and Wolmer 2006: 28), there are problems with this type of argument which:

‘.. proceeds through a series of benefit-cost analyses based on scenarios of income returns...., and assuming that an export-led scenario (requiring very expensive start-up and recurrent cost FMD control) is both sustainable (despite standards requirements from export markets) and viable (given international competition and price/exchange shifts).... the take-home policy message on priorities was clear. In the words of the report: “Effective FMD control appears to bring very limited direct benefits to the poor. However, poverty reduction measures function best in an environment of national economic growth, a situation that FMD control appears to promote” therefore “there is considerable merit in continued strong and sustained FMD control in Zimbabwe FMD control” and this potentially “can form the base for a more pro-poor service in animal health”’ (Perry *et al.*, 2003: 136, 14, 132).

But, as Perry and colleagues have pointed out elsewhere (e.g. Perry *et al.*, 2002; Perry and Rich 2007), there are always multiple pathways to poverty reduction. A number are highlighted, including: trickle down from high value export trade; local multipliers from domestic/regional markets and direct benefits to poorer small-scale producers through the reduction of vulnerability to the impacts of transboundary diseases, including FMD. While all such pathways are theoretically possible, there is rather less discussion in much of this literature on growth-poverty linkages as to which pathways have the greatest impact. In the dualistic economies, with high levels of historical inequality and very concentrated, often racially entrenched structure to the industry, the trickle down and multiplier effects to the wider economy, and so the poverty reduction impacts, are often extremely limited. For poorer livestock owners – and the many rural poor who own few or no cattle and so are not participants in the beef industry at all – the investment in FMD control, of any sort, may be prioritised somewhat lower than the expert rankings that have emerged of late (cf. Perry *et al.*, 2002).

As Perry and Rich (2007) note, much of the impact of FMD on poorer livestock keepers is through the controls imposed (notably movement restrictions and the closing of markets), not in fact the disease itself:

‘Even if no outbreaks occur, the risk of FMD has an impact on livestock keepers and the wider society, through the requirement for preventive measures and the way that confidence in the success of these measures determines access to markets. From a current global perspective, the risk of FMD has a much greater impact than the disease itself’ (Perry and Rich 2007: 239).

The question of what type of control measure – and how this is applied and where – is therefore critical in the endemic FMD settings of much of the developing world, as there are major trade-offs with significant distributional consequences at play. The good news is that, as this paper has highlighted, a greater variety of responses to FMD (and indeed other former List A transboundary diseases) exist than is often

thought. This is particularly critical for Africa where incidence of such diseases is far more significant than in competitor countries, such as in Latin America. Debates within the OIE and elsewhere around freedom with vaccination, compartmentalisation and commodity-based approaches have extended the range of scientifically-accepted options considerably, away from the standard (expensive and often unattainable) assumption that the only option is the ‘disease freedom’ pathway towards eradication. A central argument of this paper is that southern African countries need to capitalise on these changing contexts to undertake some fundamental rethinking of policy.

What are the choices ahead? Drawing from the country papers produced for this series, figure 1 below provides a schematic summary of the different scenarios identified. Six market access scenarios intersect with five disease control scenarios giving a wide array of different permutations.

Figure 1. Market access and disease control scenarios: future options?

		Market access scenarios					
		High value (forex)/ High risk/ Narrow group benefits			Low value/ Low risk Wider group benefits		
		EU export	Direct export to large retailers	Export to emerging markets (Asia)	Regional trade in SADC	Domestic urban markets	Local marketing
Disease control scenarios	High cost	Area based disease freedom	The (high risk, high cost) status quo				
	Export zones with vaccination	An existing option, comparable to South American competition					
	Compartmentalisation	An option to explore, for high value exports, although technical questions and distributional consequences					
	Commodity based trade		A key option for a broad set of high-medium value markets – as yet not fully exploited, but requiring investment in product safety testing and certification. Overall lower cost and risk spread.				
	Low cost	Managing endemic FMD					The default – high volumes, but lower unit values. An important element of the overall picture.

From this matrix, a series of overlapping policy options can be identified. These range from the high value/high risk and high cost option of EU exports under an area-based disease freedom veterinary control strategy (top left corner – the assumed ideal) to a focus on relatively low value (but high volume), but also low cost, domestic

marketing options which accepts the management – but not eradication - of endemic diseases (bottom right corner – the assumed worst case scenario). The former currently remains the favoured option of most veterinary authorities, regional policy makers and international institutions, while the latter is the default option if systems break down, as has occurred to a large extent in recent years in Zimbabwe. But, as the discussion so far has shown, the assumptions that the high value/high cost option is necessarily the best – and the one that should be striven for, and the low value/low cost is automatically bad news are not upheld. Indeed, as Perry and Rich (2007) observe, it all depends.

Perhaps more interesting for southern Africa than these two extremes are the other three options, ones that are not often discussed, yet ones that offer considerable potential as suggested above. Clearly, with OIE standards opening up options for international trade under conditions of disease freedom with vaccination, and this being central to the strategy of major international competitors from Latin America, and apparently accepted by global private sector importers, this may offer alternatives to very high-cost and risky disease eradication pathways, if vaccination cost and logistical issues can be addressed. However, the challenges of zonation, given shifts in land use, the demands for land reform and changing dynamics of disease ecologies discussed above, may prove, in the long-run too much, and other alternatives will need to be considered.

Compartmentalisation offers perhaps the best option. Here high levels of biosecurity, surveillance and disease management (including ensuring traceability) can be assured with sufficient investment. This option does not come cheap and as discussed may be only suitable for private investors who are really assured of high value returns on their products. These isolated islands of high value production may also be a target of resentment and may be politically untenable, even if the basic technical and economic issues are addressed, although smallholder producers may benefit from the emergence of a stratified production system whereby young weaners are sold on to compartmentalised farms.

Of all the options explored above, perhaps the most attractive centres on (versions of) commodity-based trade. As discussed, this shifts the emphasis away from managing diseases across geographic spaces (areas, zones, countries) to a focus on the product which is to be traded, and ensuring that this is safe. Instead of complex and expensive area-based disease control measures (of movement control, fencing, surveillance etc.), systems of product-based risk assessment and certification are needed. These need to focus on product safety rather than the disease setting from which the product is derived. While these new approaches will require investment in systems, procedures and skills, the challenges and costs of doing so are far lower than achieving (or continuing to achieve) area-based freedom in many circumstances.

In addition, commodity-based trade can be more precisely geared to different targeted markets, working with different importers to assure particular standards. This allows a wider range of market options, across a broader spectrum. At a national or regional level, this allows for the spreading of risk across a greater diversity of markets with a lower cost disease control/safety assurance/risk management system. Given the uncertainties surrounding market, disease and other contexts, this potentially offers greater resilience in the system, as well as an opportunity to spread benefits to a wider array of beneficiaries.

All of these options are scientifically feasible, and all have potential for delivering significant market returns (of different sorts). But which ones make sense for a

particular place? The country papers produced for this series make some suggestions for different countries, but stop short of making definitive recommendations. These must await more thorough deliberation and more in-depth analysis of costs, returns and trade-offs across policy objectives.

Conclusion: future options, urgent choices

To conclude, we suggest that four big challenges lie ahead, indicating a variety of future options and some urgent choices for the southern African beef industry.

First, there is a need to recast the way technical and policy debates are framed. The assumption that what has always been must always be must be set aside in favour of a more forward looking view. For example Mark Rweneyamu (2007) offers a useful contrast between the way transboundary diseases are seen in the OECD and Africa/Asia. This has major implications for their management; yet, as we have seen, the framing of problems and responses in southern Africa remain firmly hooked into a set of prescriptions derived historically from Europe and which became institutionally and professionally embedded during the colonial era.

Table 2. Contrasting framings of transboundary diseases (after Rweneyamu, 2007)

OECD – TADS are exotic	Africa/Asia – TADS are endemic
Prevention of incursion	Limitation of spread
Preparedness	Disease control
Detection of sub-clinical infection	Detection of disease
International disease intelligence	Local surveillance for disease control
Expert knowledge base for exotic diseases	Low capacity for detection, identification and monitoring

The implication of this assessment (and indeed many others – see Scoones and Wolmer, 2006; Perry 2007), is that there is a need for an Africanization of the scientific and technical agenda, along with the policy agenda, one that starts from particular African conditions and contexts not from generalised models from elsewhere.

Second, and following on from this, a reassessment of the objectives of transboundary disease control measures needs to be undertaken, with a firmer linking of these to broader developmental and poverty reduction objectives (see Perry 2007a; Perry *et al.*, 2002; Ashley *et al.*, 1996, 1999; Ashley 2000⁵⁴; ILRI 2000; Perry *et al.*, 2002; Hall *et al.*, 2004; Heffernan *et al.*, 2003; IFAD 2004). What pathways to poverty reduction and ‘pro-poor’ economic growth are being sought at a national – or regional – policy level, and so what market options, and in turn what disease control/product safety strategies, make most sense? How, in other words, can they reduce poverty, increase growth and ensure safe meat is marketed? With a range of scientifically-accepted options for disease control/product safety assurance and an array of different market options available to livestock producers, the choice of what combination is not obvious. As Figure 1 illustrates, different options may exist in parallel, but not all are as effective for delivering poverty reduction and economic growth together. What combination makes sense will, of course, depend, but, as the country studies have shown clearly, it is often not the status quo.

⁵⁴ http://www.livelihoods.org/static/sashley_NN152.htm.

Third, given these dilemmas, some hard thinking about how control measures for transboundary diseases are paid for must be undertaken in the southern African context. The long-running assumption has been that such measures are 'public goods' (sometimes international ones), that are appropriately paid for by the public purse – either nationally or through international aid support. As we have seen, this is insufficient and inadequate for the task. Even if theoretically such a funding formula was appropriate, on-the-ground results are lacking, suggesting that private funds – from the livestock industry – are required to ensure that particular market options remain open. Seen in this light these are then more private goods, and with a number of the disease control/product safety measures (including compartmentalisation and commodity-based trade and the associated certification requirements of each) mechanisms for payment by producers and suppliers could be envisaged.

Fourth, much of this discussion points towards the need for much more effective policy coordination and coherence, combined with a greater rigour in linking development objectives and commitments to poverty reduction, meeting MDG targets and broader CAADP goals, and specific policies and strategies. Simply accepting a standard technical line from a veterinary department or a trade ministry – based on long held policy assumptions or guidelines and standards developed elsewhere – is clearly insufficient. A more rigorous, cross-sectoral impact assessment is required, often needing the bringing together of insights from epidemiology and economics (cf. Perry *et al.*, 2001), but also, crucially, assessments of livelihoods and different people's own perceptions and priorities. In this sense, the choices are not simply technical ones, but political ones requiring participatory deliberation and debate about trade-offs and consequences. An open, engaged policy process is the only way such complex and often intangible factors can be grasped in a holistic way. But given the often closed, technically-driven way policy decisions are currently made around these issues, where particular interests and expertises dominate, a different way of doing business remains a major challenge across the countries and within SADC as a whole.

While agreeing on the broad objectives – of poverty reduction, broad-based growth and safe trade - is easy, a detailed examination of different returns, costs and risks of different options is more difficult. This paper and the companion papers in this series offer a beginning, but by no means an end point. What are the next steps for southern Africa towards building high return, resilient and safe beef production and marketing systems, where returns are widely distributed often in highly unequal societies?

As the paper has shown, the highly dynamic contexts of contemporary settings means that such choices are vital and urgent. But the emerging debate on the intersection of disease control/product safety and marketing/trade suggest that, perhaps unusually in development, there are some win-win options – allowing the management and control of transboundary diseases such as FMD, while ensuring viable and safe trade. What are the key elements of the policy mix required for southern Africa?

- The need for a **diversity of options** in any one country. There is no one-size-fits-all solution. There are multiple future scenarios, combining different disease and market responses (across the figure 1 matrix) in any setting.
- The diversity of options will help **build resilience** (ability to respond to future shocks and stresses) at local, national and regional levels. Exposing a whole sector to one option – particularly one with a high risk of collapse – is to be

avoided, and overall resilience can be built with a flexible policy response that incorporates a commitment to diversity.

- There is a major need for **regional coordination** on a number of fronts. This is currently weak or lacking. For example, coordination on gaining market access to new markets and engaging in negotiation on international standards is a critical challenge, and one that SADC, COMESA and other regional bodies, under the auspices of AU/NEPAD frameworks, need to engage in with a matter of urgency, particularly given the growing global competition and the changes in preferential trade access faced by many countries.
- This, in turn, will require the enhancement of **skills and capacities** in negotiating in international standard-setting fora, building trust in new market settings, as well as basic market information on emerging market opportunities. Competence, skills, capacity requirements also exist in new areas arising from the market access options that have previously not been engaged with, such as HACCP risk assessment and certification for commodity-based trade. Some of this may emerge through private sector initiative, but there is a coordination, capacity building and information support role for the public sector and international development partners.
- Overall, the **trade-offs across development policy priorities** – notably between (export) trade and economic growth and poverty reduction and enhancing equity – will have to be balanced. The rhetoric of ‘pro-poor growth’ may hide trade-offs and multiple pathways of development and poverty reduction, especially when, as has historically been the case, the trickle down from high value, export oriented strategies does not result in broader based poverty reduction. A more integrated strategy will be needed, with public funds being focused on poverty/equity objectives, with support for private sector efforts to go for high value growth (and so different parts of the Figure 1 options matrix – and not in the way funds have to date been allocated).

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