

A review of Australia's preparedness
for the threat of foot-and-mouth
disease

Ken Matthews AO

October 2011

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Foot-and-mouth Disease: A Review of Australia's Preparedness

Ken Matthews AO

Dr Conall O'Connell
Secretary, Department of Agriculture, Fisheries and Forestry
CANBERRA ACT 2600

Dear Secretary,

On 24 February 2011 you asked me to provide an independent assessment of Australia's biosecurity continuum to assess the department's and Australia's current level of preparedness and capacity to prevent and respond to an outbreak of foot-and-mouth disease (FMD). You considered that this most infectious and trade-sensitive animal disease would serve as a good indicator of Australia's general level of preparedness to cope with a range of other emergency animal disease threats.

In making my assessment I have been fortunate to be supported by a small team of your staff: Dr Andy Carroll, Australian Chief Veterinary Officer (since retired); Ms Sharon Turner, Director, Biosecurity Strategy; and Mr Hillary Cuerden-Clifford, of the Office of the Chief Veterinary Officer. At the outset, I want to draw your attention to the high quality of your officers' work as members of the Review Team. I acknowledge also the contributions of Dr Graeme Garner and Dr Rhyll Vallis of the Office of the Chief Veterinary Officer.

While I appreciate the support of your staff, I want to emphasise that I take final independent responsibility for the views, findings and recommendations expressed in the report.

Against that background, I am pleased now to submit the Review Team's assessment report. The team has found that there are many strengths of the Australian biosecurity continuum. However the costs and disruption of an outbreak of FMD in Australia would likely be enormous and despite the strengths of the Australian biosecurity system there is much that could and should be done to mitigate the risks and reduce the costs of an FMD outbreak. In its report the Review Team recommends a considerable number of practical actions to do so.

In the course of its many consultations the Review Team encountered a number of doubtful assumptions surrounding FMD management in Australia. Many of the Team's recommendations derive from our scepticism about these (sometimes implicit) assumptions:

- That an outbreak of FMD will be detected in the first few days so that stamping out could be commenced before significant spread of the disease. (The Team fears that it may be weeks before an outbreak is detected and reported by which time the disease could have spread extensively.)
- That the most likely pathway of FMD virus into Australia is through conventional, legal import processes subject to AQIS supervision and intervention. (The Team's view is that a more likely pathway is through non-transparent, illegal import channels not subject to routine AQIS intervention.)
- That state and territory government legislation is effectively managing critical control points on FMD pathways. (The Team's view is that, while legislation is in place, compliance and enforcement capacity and effort is sometimes wanting in areas such as swill feeding bans and sheep mob identification regulations.)
- That disease management response capacity will be sufficient to deal with an outbreak. (The Team's assessment is that because an FMD outbreak could be of at least an order of magnitude more demanding than any previous animal disease outbreak, state, national and industry resources could quickly be overwhelmed.)
- That 'stamping out' would proceed routinely as planned in AUSVETPLAN. (The Team's view is that human and physical capacity to stamp out by means of large scale slaughter and burial would quickly be exhausted. Further, there may well be unanticipated community opposition on animal welfare and perhaps food security/food wastage grounds.)
- That international market access would be speedily restored following eradication. (The Team's view is that key importing countries would set their own timetables to satisfy themselves that eradication had indeed been achieved. This may take months after Australian authorities had declared Australia disease free.)
- That domestic market access for meat and animal products would provide a partial buffer for industries affected by the loss of international markets. (Based on overseas experiences and advice from the Australian retail industry, the Team's view is that there could be significant domestic consumer resistance to consuming meat and animal products, including milk. Moreover, zoning restrictions may well pose extended barriers to movement of such products within the domestic market.)

In the light of the above, and to respond to your request for specific advice on the major issues, or systemic weaknesses, in Australia's FMD prevention, preparedness, response and recovery arrangements, the Review Team has worked through the biosecurity continuum and identified eleven issues deserving attention. The areas for attention are:

1. Australia's national capability to anticipate an FMD outbreak and translate warning intelligence into action
2. The standard of assurances that exporting countries' Competent Authorities are operating to Australian biosecurity requirements
3. The possibility of illegal importation of animal products
4. The effectiveness of swill feeding prohibitions
5. Australia's capacity to sustain a large-scale FMD response
6. Traceability arrangements in the sheep industry
7. Policy on FMD vaccination and associated difficulties in preparing for a short-notice vaccination campaign
8. Preparation for the known challenges of carcass disposal
9. The possibility that FMD may not be detected readily and speedily
10. A lack of clarity about responsibility and accountability for national FMD planning processes
11. Planning for community recovery.

At a higher level, the team also recommends four new policy directions for the Australian Government to pursue in its work on FMD. If adopted, these new directions would also improve preparedness and response capacity for other animal and plant diseases. The four new policy directions are:

1. **Assertive and sustained Australian Government leadership, including taking responsibility for settling issues that—largely as a consequence of consensus national decision-making processes—have remained unresolved for too long, and driving the completion of preparedness arrangements.** The Review Team notes with concern that, despite efforts and goodwill from many stakeholders, a number of critical issues remain unresolved or ambiguous years after the first development of the AUSVETPLAN for FMD. These issues include policy on the use of vaccination and the continuing absence of effective arrangements for identification and traceability of

sheep. As a consequence, 20 years after it was first prepared, parts of AUSVETPLAN for the management of FMD remain a draft. The report also draws attention to a lack of clarity about ultimate responsibility and accountability for FMD preparedness planning. Any such lack of clarity may be an unintended by-product of Australia's commendably inclusive and consultative approach to animal disease management. Active Australian Government leadership should enable faster progress in planning—although it will be important that the longstanding consultative ethos in emergency animal disease planning not be lost.

2. **Focusing more resources and effort towards the 'earlier' elements of the emergency management continuum: anticipation; prevention; and preparedness.** Until now, Australia has focused most on the post-incursion response elements of the continuum. Indeed, Australia is respected internationally for its work in these areas, such as the development of the world-leading AUSVETPLAN. Without losing these strengths, the Review Team suggests that it is now time to attend relatively more to the prevention and preparedness issues. The Review Team's report therefore includes practical suggestions for improved prioritisation in border operations, together with a range of initiatives to shorten decision making times, build disease response and management capacity, and facilitate early detection of any disease outbreak.
3. **Institutionalising processes to ensure continuing refinement and strengthening of FMD preparedness and response arrangements into the future.** It is good public administration practice for policies and plans in any sector to be kept under review and continuously adapted and improved. The Review Team is concerned that aspects of Australia's FMD arrangements currently lack triggers to ensure regular review and updating in light of, for example, advances in scientific understanding, and overseas governments' disease management experiences. In its report the Review Team has designed various processes to encourage regular updating, refinement and strengthening of plans and policies.
4. **More rigorous application of the risk-return principle, not only in border operations, but throughout the entire biosecurity continuum.** The Beale Review (2008) recommended a risk-return approach to managing biosecurity risk. Progress is being made by DAFF in this direction, but with the right guidance about risks, more can be done. For example, more can be done to prepare import risk profiles based on import interception data and/or the quarantine performance of overseas Competent Authorities, customs brokers and Quarantine Approved Premises.

Despite identifying eleven issues, the Review Team is positive overall about the state of Australia's planning for FMD. There are certainly opportunities for further improvement and these have been identified in the Team's report. However the general standard of prevention and preparedness in Australia is sound and reflects well on the many stakeholders who play their part, including your own department.

It will be necessary now that a process be established for considering the recommendations of the report and charting an implementation plan. Consistent with one of the themes of the report, it will be important that clear accountability, including timelines, be assigned to those to be made responsible for that process.

I commend the report to you and thank you for the opportunity to be able to review Australia's defences against, and contingency planning for, this high-consequence risk to Australian national interests.

Yours sincerely,

Ken Matthews

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Acronyms used

AAHL	Australian Animal Health Laboratory
AHA	Animal Health Australia
AHC	Animal Health Committee
AUSVETPLAN	Australian Veterinary Emergency Plan
AVR	Australian Veterinary Reserve
BioSIRT	Biosecurity Surveillance Incident Response and Tracing
FAO	Food and Agriculture Organisation
FMD	Foot and mouth disease
ICE	Import Clearance Effectiveness
LEADRR	Laboratories for Emergency Animal Disease Diagnosis and Response
MAFF	Ministry for Agriculture, Fisheries and Forestry
NLIS	National Livestock Identification System
OCVO	Office of the Chief Veterinary Officer (DAFF)
OIE	World Organisation for Animal Health
QAP	Quarantine Approved Premises
WTO	World Trade Organisation

Executive Summary

Foot-and-mouth disease (FMD) has been described as the single greatest threat of any disease to Australia's livestock industries. Much of Australia's large export market and the competitive advantage Australia gains from its FMD free status could be lost, possibly forever, if an FMD outbreak occurred here.

The Review Team commissioned the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) to revisit the Productivity Commission's 2002 report on the economic impact of hypothetical FMD outbreaks on Australia.

In their updated analysis, ABARES estimated that over a ten year period there would be severe direct economic losses to the livestock and meat processing sector from an outbreak of FMD. These losses ranged from \$7.1 billion for a small three month outbreak, to \$16.0 billion for a large 12 month outbreak (expressed in current dollar terms). Control and compensation costs were estimated to range between \$25 million for the small outbreak, and \$600 million for the large outbreak. Reflecting international experience, the economic impact of trade restrictions (export market closures) would be far greater than the cost of controlling the disease.

The message is clear, investment in prevention and preparedness is a prudent insurance policy against such sizable potential losses.

Australia has not had an outbreak of FMD since 1872. However, the global prevalence of FMD is increasing and FMD's recent appearance in Japan and the United Kingdom is disturbing, as these countries have sophisticated biosecurity systems similar to our own.

Recognising the increasing animal biosecurity risks confronting Australia, the Secretary of the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) commissioned this independent review of the biosecurity continuum to assess Australia's current level of preparedness and capacity to prevent and respond to an outbreak of FMD.

Objectives and approach

The objective of the review is to examine the key elements of the biosecurity continuum (pre-border, border and post-border biosecurity) to ascertain whether the systems and measures currently in place to manage the risk of FMD are robust and sufficient to mitigate the risks to an acceptable level.

The assessment draws on previous reviews of Australia's biosecurity system, the outcomes of Australian outbreak simulation exercises, current research and projects aimed at further strengthening Australia's biosecurity systems (such as the DAFF risk-return project), and biosecurity lessons learnt from overseas and Australian disasters.

Interviews by the Review Team of technical experts, front-line managers, industry representatives and international peers also informed the assessment.

Executive Summary

The adequacy of current biosecurity systems and measures were qualitatively assessed in light of the potential pathways of FMD virus. A 'strengths and weaknesses' approach was taken to identify Australia's vulnerabilities to FMD incursion, establishment and spread.

Recommendations to address these issues are provided throughout the review. The aim was to suggest pragmatic, achievable solutions that can be implemented largely through re-prioritisation of existing resources in the short to medium term.

The Review Team's assessment

The Review Team acknowledges that the Australian biosecurity system is generally considered to be strong. It enjoys a number of strengths, such as: comprehensive government-industry cost-sharing agreements and emergency response planning, good laboratory facilities and international engagement, committed staff, and is progressively implementing a risk-return approach.

However, the Review Team identified eleven issues with the potential to substantially reduce the effectiveness of Australia's efforts against the threat of FMD. The issues cover the breadth of the biosecurity continuum (pre-border, border and post-border) and the emergency management continuum (anticipation, prevention, preparedness, detection, response and recovery).

The eleven issues were in the areas of:

1. Australia's national capability to anticipate an FMD outbreak and translate warning intelligence into action
2. The standard of assurances that exporting countries' Competent Authorities are operating to Australian biosecurity requirements
3. The possibility of illegal importation of animal products
4. The effectiveness of swill feeding prohibitions
5. Australia's national capacity to sustain a large-scale FMD response
6. Traceability arrangements in the sheep industry
7. Policy on FMD vaccination and associated difficulties in preparing for a short-notice vaccination campaign
8. Preparation for the known challenges of carcass disposal
9. The possibility that FMD may not be detected readily and speedily
10. A lack of clarity about responsibility and accountability for national FMD planning processes
11. Planning for community recovery.

While the Review Team made numerous individual recommendations to address each issue, they fall broadly into the following policy directions which have been developed as guidance for the Australian Government in particular:

1. **The Australian Government should have a clear and decisive leadership role** in driving collective animal health stakeholders toward the delivery of national commitments and continuous improvements under the shared-responsibility approach. Leadership should include work towards the decisive resolution of long unresolved but important preparedness issues (such as vaccination). Such leadership needs to be exercised in a way that maintains the commendable consultative ethos that has characterised emergency animal disease planning in Australia for many years.
2. **Greater resources and effort should be directed towards the anticipation, prevention and preparedness elements of the emergency management continuum.** The Australian Government should drive the improvements in emergency management policy by focusing relatively more on anticipation and threat mitigation. Leadership should be taken in establishing a dedicated foresighting and early warning intelligence function, improving and dedicating more resources to pre-border presence and effectiveness, and improving preparedness post-border in a systematic manner.
3. **Institutionalising processes and functions to ensure continuing refinement and strengthening** of FMD preparedness. The Australian Government should be empowered to take responsibility to ensure the regular review and continuous improvement of preparedness arrangements by embedding within normal business practice: (a) more regular, systematic and sufficiently rigorous testing of capacities and capabilities; (b) anticipation via foresighting, early warning intelligence and horizon scanning; and (c) initiating FMD issues onto and through the agendas of the Primary Industries Ministerial Council and Standing Committee.
4. The Australian Government should drive **more rigorous application of the risk-return principle** not only in border operations, but throughout the biosecurity continuum. Such a re-prioritisation would see resources directed towards areas of higher risk along the entire biosecurity continuum, and free up much needed resources to contribute to strengthening critical pre- and post-border components of Australia's prevention, preparedness and response capabilities.

A REVIEW OF AUSTRALIA'S PREPAREDNESS FOR THE THREAT OF FOOT-AND-MOUTH DISEASE

Background to the assessment

About this review

Recognising the increasing animal biosecurity risks confronting Australia, the Australian Government has been focusing on the threat of FMD, and the nation's ability and capacity to prevent an incursion, or to respond effectively should the disease reach our shores.

The Secretary of the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF) therefore commissioned this independent review of the biosecurity continuum to assess Australia's current level of preparedness and capacity to prevent and respond to an outbreak of FMD, recognising that this most infectious and trade-sensitive animal disease will serve as an excellent indicator of Australia's preparedness to cope with a range of other animal disease threats.

The objective of the review is to examine the key elements of the biosecurity continuum—that is pre-border, border and post-border—to ascertain whether the systems and measures currently in place to manage the risk of FMD are sufficient to mitigate the risks to an acceptable level. Where issues and response gaps are found, the Review Team is to make recommendations on improvements.

The assessment draws on previous reviews of Australia's biosecurity system and its components (such as the Nairn and Beale reviews), the outcomes of simulation exercises (such as Exercise Minotaur and Exercise DIVA), as well as current research and projects aimed at further strengthening Australia's biosecurity systems (such as the DAFF risk-return project).

Lessons learnt in other countries have been examined; most notably, the FMD outbreak of the United Kingdom in 2001, as well as outbreaks in Japan, South Korea and the Netherlands. The lessons learnt from recent Australian experience in managing a national animal disease emergency—the equine influenza outbreak in 2007—were also taken into account.

The Review Team conducted interviews with technical experts, front-line managers, industry representatives and international peers

The report seeks to identify the potential pathways into Australia of the FMD virus. The Review Team took a 'strengths and weaknesses' approach to the assessment of current systems, arrangements and policies in place to block the pathways or to manage the consequences of a failure. The Review Team has identified 11 issues for Australia.

Recommendations to address these issues are provided throughout the review. The recommendations are intended to take the form of pragmatic, achievable solutions which can be implemented largely within existing resources in the short to medium term.

Although ongoing biosecurity reform of the scale and scope that Beale suggested remains necessary, this review takes a more limited FMD-specific lens to the system and focuses on pragmatic remedies that will help reduce the risk of FMD entering and establishing in Australia, noting that many suggestions will also improve the management of other animal and plant diseases.

Key findings: Part 1

Current strengths of the Australian biosecurity system

Over the years there have been a number of reviews of Australia's biosecurity system—the most recent is *One Biosecurity: a working partnership*, also known as the Beale review.¹ That review concluded that while improvements could be made, Australia operated a good biosecurity system, one that was 'often the envy of other countries given its comprehensiveness, transparency, and scientific rigour'.

The Review Team considers the most notable strengths of the Australian biosecurity system to be:

The Emergency Animal Disease Response Agreement

This agreement is a world-first between national and state-level governments and livestock industry sectors that sets out the arrangements for decision-making and terms of cost-sharing for emergency animal disease responses. The pre-agreed arrangements set out in the agreement provide commendable clarity (in advance) for all stakeholders about their roles, responsibilities and contingent liabilities in the event of an outbreak.²

AUSVETPLAN

With its comprehensive range of up-to-date, disease-specific response manuals, Australia is a global leader in animal disease response planning.³ AUSVETPLAN has been validated by a number of exercises held over recent years. In addition, the training and awareness activities undertaken by Animal Health Australia (AHA), industry and governments to support AUSVETPLAN have proved valuable during real and simulated outbreaks.⁴

Laboratory facilities

Australia has world-class laboratory facilities and specialists to research FMD and perform high-volume testing during emergencies. The Australian Animal Health Laboratory in Geelong was purpose-built for FMD. The state and territory laboratory services will also provide important diagnostic services in an outbreak of FMD;

¹ http://daff.gov.au/__data/assets/pdf_file/0010/931609/report-single.pdf

² <http://www.animalhealthaustralia.com.au/signing-ceremony/eadra-questions-and-answers/>

³ <http://www.animalhealthaustralia.com.au/programs/emergency-animal-disease-preparedness/ausvetplan/>

⁴ Animal Health Australia. Report of the National Review of Australia's Response to the 2007 outbreak of equine influenza. Animal Health Australia, Canberra, March 2009, p17.

however, more needs to be done in peace time to ensure they are fully equipped for this scenario (see Issue 6: Surge capacity).

Livestock traceability

Through the National Livestock Identification System, Australia has an excellent traceability system for cattle, a system which other countries such as New Zealand are adopting with Australian assistance. The tracing system is of great value in identifying the location, contacts and movements of animals for disease control purposes.

Australia's global contribution and influence

Australia is an active contributor to the delivery of global animal health programs that assist other countries to manage disease threats.⁵ In forums such as the World Organization for Animal Health (OIE), United Nations Food and Agriculture Organisation (FAO) and the World Trade Organization (WTO), Australia is influential in the setting of international standards and global policy that support Australia's valuable trade in animals and animal products.

Through its engagement in bilateral and multilateral capacity building activities, Australia is able to keep a finger on the pulse of global developments and contribute to the mitigation of risks across the region.

Current controls

Australian scientific, technical and administrative measures for managing the trade, movement and handling of agricultural products have been generally effective in preventing the entry, establishment and spread of pests and diseases in Australia. Existing border controls have a generally good record, and the progressive implementation of risk-return strategies should bring further improvements. Most systems are well-tried, and are administered by experienced and committed staff.

Current programs of biosecurity reform

The Australian Government has committed to a range of constructive reforms to Australia's biosecurity system in keeping with the risk-return approach recommended in the Beale Review.⁶ The reforms aim to move away from intervention targets towards a more risk-based approach that enables scarce resources to be applied to the areas of most risk. The reform program also includes the development of new biosecurity legislation for: enhancing co-regulatory

⁵ <http://www.animalhealthaustralia.com.au/wp-content/uploads/2011/01/Regional-animal-health-initiatives.pdf>

⁶ <http://www.daff.gov.au/bsg/biosecurity-reform>

arrangements with industry partners, updating import conditions and facilitating more efficient importation of goods.

New policy directions

The Review Team identified eleven issues (see Part 2) in Australia's ability to prevent or respond effectively to an incursion of FMD. The review findings fall into **four recommended policy directions for the future**:

- Assertive and sustained Australian Government leadership, including taking responsibility for driving preparedness arrangements and settling long-unresolved issues that—as a consequence of consensus national decision-making processes—have remained unresolved for too long, and driving the completion of preparedness arrangements.
- Focussing more resources and effort towards the earlier elements of the emergency management continuum: anticipation, prevention and preparedness.
- Institutionalising processes to ensure continuing refinement and strengthening of FMD preparedness and response arrangements into the future.
- More rigorous application of the risk-return principle not only in border operations, but throughout the entire biosecurity continuum. In particular, relatively more resources are required for anticipation and preparedness efforts pre and post border.

1. Active and sustained Australian Government leadership

An outbreak of an animal disease such as FMD would clearly be an event of national significance. A large outbreak of FMD has the potential to reduce Australian Gross Domestic Product (GDP) by \$10.3 to \$16.7 billion over ten years—equivalent to a one to two per cent reduction in GDP for one year (See Appendix 2).

The Australian Government—through DAFF—therefore has a responsibility provide leadership. Overseas experience is that the community has a clear expectation that the national government will play a central role in dealing with such national-scale events. However it is important that national leadership does not discourage 'shared responsibility' as emphasised by the Beale review. Shared responsibility is integral to the effectiveness of Australian biosecurity. All stakeholders need to continue to do their part, and in doing so contribute to the national good.

A challenge with the concept of shared responsibility to date in Australia has been the dilution of leadership among the many stakeholders in FMD. The Review Team considers there is a need to re-establish clear and decisive leadership to drive stakeholders toward the delivery of their respective commitments and improvements under the shared-responsibility approach. The Review Team considers this leadership role rests with the Australian Government.

Among the many stakeholders in FMD, the Australian Government bears the largest contingent liability for emergency animal disease outbreaks. This liability extends to meeting both the majority of response costs and underwriting affected industries

while they arrange to ‘repay’ their share of response costs over a number of years (as set out in the Emergency Animal Disease Response Agreement). In addition, there may be an expectation that the Australian Government will make compensation or adjustment payments to offset the economic and social costs imposed on the broader Australian community by an FMD outbreak.

Experience has shown that the Australian Government will often be held politically accountable by the community for the effectiveness of biosecurity controls and disease responses, regardless of the action (or inaction) of jurisdictions and industry stakeholders.⁷

For these reasons, at least, Australian Government leadership will be important and the Review Team has identified three specific areas where it recommends action:

Driving preparedness arrangements and settling long-unresolved issues

National–state and government–industry consultative mechanisms that slow the resolution of important preparedness issues need to be addressed. There are a number of key issues where responsibility and accountability have been diffused among the range of players involved, and therefore decisions have been slow and/or lowest common denominator.

In particular, Australia’s policy on the early use of vaccination urgently needs updating, and questions surrounding the fate of vaccinated animals need to be resolved. Similarly the problems of sheep traceability and animal carcass disposal continue to be conspicuous gaps in emergency disease preparedness. Each of these issues is discussed in more detail later in this report.

The Australian Government also needs to have the role of driving planning processes. Diffuse lines of responsibility have meant that development and updating of Australia’s animal disease management arrangements have tended to drift. There is an opportunity to improve arrangements if it is made clear that the Australian Government has the responsibility for regular initiation of processes of review and improvement to national FMD plans.

Continuously improve preparedness through the use of foresighting and horizon-scanning, and strategic intelligence

It is important that disease preparedness arrangements in Australia keep pace with global developments, new scientific knowledge, technology and innovation, and progress in policy. International and local changes in agricultural practices and social

⁷ <http://www.abc.net.au/news/2008-06-12/racing-industry-accepts-joint-blame-for-horse-flu/2469502>

values (such as attitudes to animal welfare), and technology (such as vaccines and diagnostics) can all have an impact on the adequacy of Australian preparedness. Given its international linkages, the Australian Government is best placed to service the national need to gather strategic intelligence about overseas trends and developments to inform biosecurity policy and preparedness activities.

2. Focussing more resources and effort towards the earlier elements of the emergency management continuum: anticipation, prevention and preparedness

The Council of Australian Governments is seeking to shift the focus of emergency management in Australia beyond response and recovery, to anticipation and mitigation.⁸ The shift is consistent with one of the major findings of this review: the need for an increased focus on anticipation, prevention and preparedness measures for FMD.

Economic analysis of the potential impacts of FMD carried out by the Productivity Commission in 2002 and updated for the purposes of this review in June 2011 (see Appendix 2), indicates that investment in anticipation, prevention and preparedness is prudent insurance against sizable potential losses.

It is arguable that anticipation, prevention and preparedness for FMD have received less attention in the past due to the historical approach to emergency animal disease management in Australia which focused on response and recovery, together with the historical focus on border controls as the chief practical means of protecting Australia from FMD and its impacts.

The shift now recommended toward strengthened anticipative and preventative measures to better mitigate the threat of FMD, will require a greater focus on **pre-border** biosecurity efforts, including the establishment of a dedicated foresighting and early warning intelligence gathering function to ensure resources and effort are well matched to current needs and priorities.

It will also include greater efforts **post-border** to strengthen preparedness capabilities. These efforts include, for example, building stronger national capacity for early disease detection, taking certain response decisions in advance, identifying and training critical human resources, and pre-deploying equipment and consumables to allow for rapid and decisive action to occur when it is needed.

⁸ http://www.coag.gov.au/coag_meeting_outcomes/2011-02-13/docs/national_strategy_disaster_resilience.pdf

3. Institutionalise processes to ensure continuing refinement and strengthening into the future

Preparedness for FMD should not remain static. It is good public administration practice to build-in process milestones to ensure regular review of policies and plans by senior decision-makers, and continuous improvement of preparedness arrangements. For example, FMD policies and plans endorsed by the Primary Industries Ministerial Council or the Primary industries Standing Committee should routinely include a schedule of regular review cycles and report-back dates. The review team suggests that DAFF should report at least annually to the Minister on FMD preparedness and improvements planned, and DAFF senior executives should be accountable for progress in FMD preparedness work in their performance agreements.

In the Review Team's view, institutionalising continuous improvement should also include:

Arrangements for testing of system capacities and capabilities

Australia's preparedness and capacity to prevent and respond effectively to a significant emergency animal disease outbreak, such as FMD, has not been fully tested. While a valuable source of information about Australia's preparedness for FMD, Exercise Minotaur⁹ conducted in 2002 tested only one aspect of preparedness—our emergency response to an FMD outbreak. Exercise DIVA recently tested some elements of Victoria's response capabilities.¹⁰

While past simulation exercises have been valuable, it is important that more regular and systematic system testing of both capability and capacity is established, sponsored by the Australian Government in its leadership role, to ensure that the true state of the nation's readiness is understood. As well as reviewing necessary capabilities, it is important also to test capacity against established contingency plans. This includes an assessment of the resources required to deliver actions covered in contingency and response plans in a severe-case scenario. Lessons could be adopted from the United Kingdom, where the Emergency Readiness Management Assurance Scheme regularly (almost yearly) provides an assessment of such preparedness.¹¹

⁹ <http://www.daff.gov.au/animal-plant-health/emergency/exercises/minotaur>

¹⁰ <http://www.oie.int/animal-health-in-the-world/the-world-animal-health-information-system/simulation-exercises/detail/article/simulation-exercise-foot-and-mouth-disease-in-australia-1/>

¹¹ <http://www.defra.gov.uk/consult/files/110318-animal-disease-plan-condoc.pdf>

Additionally, previous FMD simulation exercises in Australia have tended to focus on management of the first few days of an outbreak and associated decision-making. However, testing the adequacy of prescribed practical arrangements—such as those for carcass disposal—is equally important. Testing needs to be sufficiently extended and extensive if it is to identify problems all along the response chain. Otherwise, Australia risks duplicating the United Kingdom’s 2001 experience whereby simulation exercises before the event failed to identify what emerged as critical pressure points (such as culling and disposal) after the crisis started.¹²

Foresighting, strategic intelligence and horizon scanning

Australia currently lacks a systematic approach to foresighting, gathering information for early warning intelligence, and horizon scanning for animal diseases. In the Review Team’s view it will be important to build in (‘institutionalise’) these capabilities within the Australian Government. Horizon scanning involves gathering information from various sources to produce intelligence about the animal pest and disease status of regional countries and trading partners, and identifying emerging issues and threats.

Good foresighting arrangements can assist in identifying potential biosecurity risks which can then be registered in a systematic system of ratings or alert levels linked to prescribed courses of threat mitigation action. The rating system should provide recognition of the changing nature of risks, and the need for continual identification and reassessment based on new intelligence.

Institutionalisation of horizon scanning and foresighting would provide a home for the latest information (at national and international levels) about FMD outbreaks, trends and developments in relevant science, risk-based priorities in border control, and international practices on border control and disease management. Strategic information and early warning of this type would enable Australia to apply a stronger risk-return approach to biosecurity activities.

4. More rigorously applying the risk-return principle throughout the biosecurity continuum

The Beale review (2008) recommended a risk-return approach to managing biosecurity risk. A risk-return approach involves better targeting of strategies and resources towards the areas of highest risk.¹³

¹² Foot and Mouth Disease 2001: Lessons to be Learned Inquiry Report, 2002. Available at: <http://webarchive.nationalarchives.gov.uk>

¹³ http://daff.gov.au/_data/assets/pdf_file/0010/931609/report-single.pdf

Key findings: Part 1

Despite progress made by DAFF in this direction, there remain a number of biosecurity risk management activities that could benefit from stricter application of the risk-return approach.

For example, Australia would benefit from clearer prioritisation, or categorisation, of exotic pests and diseases, to enable monitoring and surveillance activities to be aligned with the level of risk associated with each pest or disease. Similarly, more can be done to prepare import risk profiles based on import interception data and to use these profiles to guide border work priorities.

Similarly, Australia's means of assessing the integrity and performance of overseas and local entities, systems and processes involved in the movement of goods into Australia are under currently underdeveloped. Evidence of this is presented in the sections of this report dealing with the issues associated with overseas competent authorities and illegal importation of animal products.

The Review Team acknowledges that fundamental shifts in biosecurity operations are difficult when day to day work pressures continue to bear on operational staff. However, these challenges provide a clear opportunity for the Australian Government to achieve a strong and immediate reduction in Australia's vulnerability to FMD by ensuring that the risk-return principle is more rigorously applied across the entire biosecurity continuum.

Key findings: Part 2—the eleven issues

The Review Team identified eleven key areas where efforts should be strengthened to prevent the entry of FMD into Australia or, should prevention fail, to prevent establishment or deal effectively with an incursion. These issues cover the breadth of the biosecurity continuum, as well as the emergency management continuum (i.e. from anticipation through to response and recovery).

Each of these issues is discussed in further detail in the following pages, and where possible the Review Team has identified potential actions that could be taken to reduce the extent of the issue.

In this section of the report the Review Team summarises each of the issues it has identified.

ANTICIPATION

Issue 1: Australia's national capability to anticipate an FMD outbreak and to translate warning intelligence into action

The world is a rapidly changing place, and events that have the potential to impact on Australia's biosecurity are constantly emerging. However there are weaknesses in Australia's capacity to gather the information relevant to Australia's biosecurity interests, and to transform it where necessary into organisational behaviour and action. The low level of this anticipation, strategic foresight, intelligence and analysis capacity, and the absence of institutional mechanisms to turn such early warnings into necessary action, mean that Australia's planning for FMD will be reactive, leaving it vulnerable to newly emerging biosecurity threats.

PREVENTION

Issue 2: The standard of assurances that exporting countries' Competent Authorities are operating to Australian biosecurity requirements

Much of the quarantine risk product imported into Australia is cleared through quarantine on the basis of accompanying documentation—such as exporting-country official health certificates, various forms of 'statutory declarations' by manufacturers or exporters, and manufacturer letterhead declarations. Yet even with well-established trade, there can be significant risks in these processes. Inadequate or out of date knowledge relating to competent overseas authorities, and the systems in place to validate exporter assurances, can undermine the veracity of import documentation and increase the risk of an FMD incursion.

Issue 3: The possibility of illegal importation of animal products

While Australian biosecurity systems deal with the risks associated with legally imported and declared quarantine products, illegally imported products are by definition not subject to the same safeguards. Australia has in place regulatory and inspection systems to intercept quarantine risk products at the border and the Review Team found that these were substantially effective. However, in the particular case of sea cargo, the system maintains a strong reliance on importers and their agents accurately declaring such products. While certain systems are in place to verify that products have been accurately declared, the scale of this verification is

limited, and its scope is largely restricted to products known to be of some quarantine concern. Current arrangements also have deficiencies in their ability to identify and target higher quarantine risk importers, exporters to Australia, agents, transporters and certain product types (for example, refrigerated cargo).

Issue 4: The effectiveness of swill feeding prohibitions

The feeding of swill (food waste, garbage or other products likely to contain unsterilized meat) to pigs provides the most viable and likely opportunity for the FMD virus to establish in Australia. This is because in order to establish in Australia, the FMD virus must not only bypass Australia's quarantine border controls but must also be exposed to a susceptible host. Most of the FMD risk materials that might enter Australia are likely to be in the form of illegally imported meat products, and overseas experience shows that pigs are the most likely animals to become exposed and infected due to their omnivorous (eating both meat and plant products) habits. This is why swill feeding is illegal in all states and territories of Australia. However there are problems with the effectiveness and enforcement of the ban among peri-urban and smallholder farmers. This is concerning, given the experiences of other countries where swill feeding of pigs has led to FMD incursions.

PREPAREDNESS

Issue 5: Australia's national capacity to sustain a large-scale FMD response

The Review Team found that Australia does not currently have the capacity that would be required to mount and sustain an effective response to a medium-to-large outbreak of FMD. Experience gained from real emergency disease responses such as the 2007 outbreak of equine influenza, and from simulation exercises such as Exercise Minotaur and DIVA, provides strong evidence that Australia does not have sufficient suitable human resources to manage anything other than a small FMD incursion. Overseas experience has clearly demonstrated that mounting a successful response to a significant FMD incursion requires considerable resources sustained over a considerable period of time. Australia has done little to address the known capacity shortfalls in its emergency animal disease response capacity. Failure to address these deficiencies in Australia's ability to resource a sustained response will result in systems and people quickly becoming overwhelmed, the crisis escalating, and a failure to control or contain the disease.

Issue 6: Traceability arrangements in the sheep industry

Livestock traceability is an essential prerequisite for an effective response to an FMD incursion. Once the disease is discovered it is essential that animal movements can be traced both forward and backwards to identify properties that may have been exposed. The speed with which Australia identifies, tracks and assesses dangerous traces will be key determinants of the size, duration and cost of the outbreak. Partly for this reason, Australia has developed national livestock traceability performance standards. However, while the cattle industry is achieving the targets set by the standards and the pig industry has measures in place, recent simulation exercises have demonstrated that the sheep industry falls short of meeting these targets. The Review Team found that the sheep industry's current mob-based and largely non-electronic systems are not capable of meeting the nationally agreed

standards for livestock traceability. This is particularly concerning given the role sub-clinically infected sheep may play in moving the disease around the country.

Issue 7: Policy on FMD vaccination and associated difficulties in preparing for a short-notice vaccination campaign

An important weapon is missing from Australia's arsenal against FMD. Australia lacks a clear and current policy on the use of vaccination as a control strategy for an outbreak of FMD. As things stand, decisions to vaccinate or not would need to be made in the heat of crisis, and probably against the background of vigorous public debate. Delays in making decisions about the use of vaccination could pose a significant threat to the nation's ability to respond rapidly and effectively to an FMD incursion. Both experience overseas and disease modelling studies carried out in Australia show that, in some circumstances, early vaccination is essential to effective disease control. Importantly, the absence of a clear and agreed national policy on the use of vaccination means that essential planning—including logistical arrangements for the deployment and use of vaccine—cannot be finalised.

Issue 8: Preparation for the known challenges of carcass disposal

There is a real possibility that an FMD incursion could have spread widely before it is detected and/or that the initial outbreak will affect an intensive livestock raising area. In this situation an emergency response to an FMD outbreak will require the humane slaughter and disposal of large numbers of animals. However the Review Team found that—despite warnings—plans and preparations at the necessary scale are not in place for this eventuality. In particular, Australia is likely to immediately face logistical challenges associated with the slaughter and disposal of animal carcasses. Current deficiencies in plans and preparations for carcass disposal will slow disease control efforts and pose an additional challenge for decision makers in the midst of a crisis. The Review Team also observes that public attitudes to animal slaughter may be changing. Long-standing plans for aggressive 'stamping out' may incorrectly assume public acceptance of large-scale slaughter of diseased and /or apparently healthy but at-risk animals.

DETECTION

Issue 9: The possibility that FMD may not be detected readily and speedily

Despite a positive track record of recognising exotic and emerging diseases in recent years (such as Newcastle disease and avian influenza in poultry, and Hendra virus and equine influenza in horses) the Review Team found that in Australia, there is still a strong possibility that an incursion of FMD may not be readily detected. This is due to a range of factors including: the often subtle clinical signs displayed by infected animals—or the absence of clinical signs in species such as sheep; the similarity of symptoms between FMD and other less serious but more common diseases such as footrot; and varying degrees of FMD-awareness amongst producers, coupled with an apparent reluctance to contact veterinarians to tend to livestock.

FMD can spread rapidly if detection is delayed. Any delay in detecting FMD could seriously amplify the scale and duration of the outbreak, the losses that are experienced, and the nation's ability to recover. Early detection is crucial in limiting the spread of an outbreak and enabling a swift and effective response to contain and eradicate the disease. Overseas experiences, and modelling in Australia, indicate that

even a few days delay in detecting an outbreak can make a big difference to the scale and duration of the incursion.

RESPONSE

Issue 10: A lack of clarity about responsibility and accountability for national FMD planning processes

Australia's current planning processes for FMD have developed against a background of consensus decision-making arrangements involving Australian and state/territory governments and affected industry bodies. However, such commendable consultative arrangements have tended to obscure authority, responsibility and accountability for progress in national FMD planning and preparations, and increased the potential for delays, confusion and compromise. Legal and political authority for decisions is not always clear and accountability for making progress (for example, to finalise draft plans and to tackle topics in dispute) is often 'collectivised'. As a result, no single body or individual is sufficiently clearly responsible.

RECOVERY

Issue 11: Planning for community recovery

Emergency animal disease events of the scale of an FMD outbreak can adversely impact communities in a number of ways. Negative impacts can be due either to the disease itself or control and response efforts. In the absence of preplanning, governments may well be forced to implement community compensation and recovery arrangements on an ad hoc and possibly inconsistent basis. Affected individuals and communities will have diverse needs, wants and expectations that are both immediate and evolve rapidly. In the Review Team's view, arrangements need to be put in place now to set predictable and consistent parameters for community recovery programs to ensure that individuals, families, businesses and communities affected by an FMD outbreak have access to services and assistance that enable rapid national recovery.

The following section of the report provides more details about each of the 11 issues.

Issue 1: Australia's national capacity to anticipate an FMD outbreak and translate warning intelligence into action

The world is a rapidly changing place, and events that have the potential to impact on Australia's biosecurity are constantly emerging. However there are weaknesses in Australia's capacity to gather the information relevant to Australia's biosecurity interests, and to transform it where necessary into organisational behaviour and action. The low level of this anticipation, strategic foresight, intelligence and analysis capacity, and the absence of institutional mechanisms to turn such early warnings into necessary action, mean that Australia's planning for FMD will be reactive, leaving it vulnerable to newly emerging biosecurity threats.

DISCUSSION

In keeping with the Council of Australian Governments new whole-of-nation, resilience-based approach¹⁴ to emergency management, the Review Team considers that the focus of Australian biosecurity services needs to shift more towards threat mitigation. Mitigation is achieved through an increased focus on anticipation, prevention and preparedness measures.

In the Review Team's view, Australia's anticipation, threat assessment and early warning capabilities could and should be strengthened through the use of foresighting, horizon scanning and strategic intelligence techniques. This would help to ensure global, regional and scientific developments are properly assessed for their potential impact on Australian biosecurity and are better taken into account in biosecurity planning and operations.

The Review Team encourages a strengthening of Australia's anticipatory capability, which will involve embedding the following capabilities within Australia's biosecurity services:

1. Foresighting: looking ahead, futures thinking
2. Strategic intelligence: environmental scanning
3. Translation capacity: making it functional.

1. Foresighting

Foresighting (also known as futures thinking) is a process of anticipating and managing change. It is a systematic and participatory approach that aids development of effective strategies and policies for the medium to longer-term

¹⁴ http://www.coag.gov.au/coag_meeting_outcomes/2011-02-13/docs/national_strategy_disaster_resilience.pdf

future.¹⁵ Foresighting is a dynamic process that continues to look ahead to anticipate the next change. While foresighting does not focus on day-to-day operational concerns, it can provide important insights into how operations can be reformed to better manage emerging threats and opportunities in a rapidly changing world. Importantly, foresighting looks beyond existing patterns. Foresighting explicitly recognises that the future is uncertain and that seriously disruptive events can and will happen. The goal of foresighting is not just to prepare well for the future, but also to take opportunities to shape and create the future.

2. Strategic intelligence

In the context of this review, strategic intelligence refers to an institutionalised capacity (that is, capacity embedded as a core function of Australian Government biosecurity services) to maintain a watching brief on emerging animal disease issues and continually analyse their implications for Australia's animal health systems and broader trade interests.

The serious nature of FMD means that basic information on affected countries and regions and disease prevalence is usually readily available. The implications of an FMD outbreak are such that many countries around the world, including Australia, take a conservative approach. This means that they do not allow the importation of animals or animal products from countries known to be infected with FMD.

However, less obvious events and developments in other countries and Australia can quickly change the extent of Australia's vulnerability to FMD. These include changes in trading patterns, manufacturing practices, government veterinary service standards, market demands and food shortages. Any one of these changes can alter the risk profile of FMD for Australia. Yet this information is not readily available in the course of daily biosecurity business. Nor are there institutionalised arrangements for analysing these trends and developments and using them to inform policies and operations.

The Australian Government would therefore benefit from developing a better-resourced strategic intelligence unit within its biosecurity services that enables the organisation to: review global developments beyond the traditional scope of animal health interests, gather and consolidate this information, analyse it for its relevance to Australia's biosecurity interests and, importantly, ensure the analysis is translated into organisational action. Such a unit could be supported by a multidisciplinary analysis team that includes jurisdictions and industry stakeholders.

¹⁵ <http://www.eugrasp.eu/Foresight-and-scenario-building.321.0.html>

3. Translation to action

Foresighting and strategic intelligence activities will require complementary institutional mechanisms to allow insights to be translated into timely organisational action. Mechanisms will need to be developed to disseminate insights and guidance to key decision makers and to ensure they are taken into account.

Critical enablers of an effective intelligence and foresighting capability

Organisational culture

An increased focus on foresighting and intelligence is likely to challenge accepted approaches and views about biosecurity in Australia. It will therefore be important to establish a culture that values and enables the use of foresighting and intelligence. Australian Government biosecurity services could benefit from:

- better recognition of the value of intelligence among senior, central and line managers
- an organisational development program that embeds a culture of foresighting and intelligence skills within the organisation (including accommodating foresighting and intelligence in business planning and performance agreements).
- External stakeholders—including states and territories, industry representatives and experts from a range of disciplines—engaged to contribute perspective and expertise to intelligence activities. This could be done through the establishment of an Australian Government-led National FMD Intelligence Network.

Maintaining networks

It will be important also to nurture Australia's international animal and plant disease intelligence networks. These networks contribute to our knowledge about the animal, pest and disease status of neighbouring and regional countries and trading partners. They can also provide early warning of emerging issues and threats which can shape the development of risk-based biosecurity strategies at home.

Similarly, through its engagement in multilateral and regional capacity building activities, Australia is able to keep a finger on the pulse of global developments and contribute to the mitigation of risks across the region. Collaboration with Asia Pacific Economic Cooperation processes and the Association of South East Asian Nations are examples of existing capacity building activities.

It will be important that adequate resources continue to be made available to maintain Australia's global presence, influence and access to intelligence sources.

CONCLUSION

Australia needs greater capacity to anticipate possible future threats. This can be achieved by the development of a capability and culture within the Australian Government that uses foresight and intelligence proactively to monitor trends and developments relevant to the nation's biosecurity and uses these to inform and guide activities to reduce Australia's vulnerability to FMD. Consistent with the Review Team's new policy direction number (3)—that processes need to be built in

Issue 1: Intelligence and anticipation

to force regular attention to refinements of Australia's approach to FMD management—the recommended Foresighting Unit will need to be empowered to make recommendations directly to senior decision-makers.

RECOMMENDATIONS

The Review Team recommends that:

1. An enhanced capacity for intelligence gathering, analysis and policy translation be established and nurtured as new core capabilities within the animal health services of DAFF. As well as seeking to embed such capabilities throughout the organisation, this will require the establishment of:
 - A foresighting, scanning and intelligence gathering unit, with the purpose of gathering intelligence relevant to FMD, in the first instance. Over time, the unit's role could be broadened to other animal disease and biosecurity threats and emergencies.
 - A decision-making group whose role would be to consider recommendations from the multi-disciplinary analysis unit and the National FMD Intelligence network (see below). Alternately, this function could be worked into the terms of reference of the current Biosecurity Management Group. Where possible, decision-makers should be the managers responsible for the policy or operational areas in question.
2. DAFF establish and lead a National FMD Intelligence Network involving external stakeholders—including states and territories, industry representatives and experts from a range of disciplines—that meets regularly to conduct foresighting activities and share intelligence.

The network should develop regular reports for the Australian Chief Veterinary Officer.

3. Foresighting and intelligence skills should be fostered within biosecurity organisations by including these skills within organisational development programs, business planning and performance agreements.
4. The Australian Government should maintain and strengthen its existing international animal disease intelligence networks and pre border activities that will contribute to Australia's intelligence capability.

Issue 2: The standard of assurances that exporting country competent authorities are operating to Australian biosecurity requirements

Much of the quarantine risk product imported into Australia is cleared through quarantine on the basis of accompanying documentation—such as exporting-country official health certificates, various forms of ‘statutory declarations’ by manufacturers or exporters, and manufacturer letterhead declarations. Yet even with well-established trade, there can be significant risks in these processes. Inadequate or out of date knowledge relating to overseas competent authorities, and the systems in place to validate exporter assurances, can undermine the veracity of import documentation and increase the risk of an FMD incursion.

DISCUSSION

Under international co-regulatory trade agreements, quarantine risk product imported into Australia is often cleared on the basis of accompanying documentation.¹⁶ This documentation—mostly official health certificates and declarations—is provided by the exporting country’s ‘Competent Authorities’.

Competent Authorities (often government bodies) are those entities legally empowered to provide documentation confirming that products comply with the hygiene standards and sanitary regulations of the importing country.¹⁷ For example, documentation may need to confirm that a product has been heat treated to destroy particular organisms, has originated from an FMD-free country or zone, or was produced under certain conditions. This type of documentation provides a certain level of assurance that specific preventive disease measures have been undertaken prior to the arrival of the product in the importing country: these measures are a form of pre-border biosecurity. Official advice provided by competent authorities in other countries, such as reporting of a country’s disease status, is also used to inform Australian import requirements for products.

However, the reliability of documentation and advice is dependent on the standards of the exporting country’s competent authority and exporters. Deteriorating administrative standards in the exporting country can reduce the quality of assurance and create a risk pathway for FMD. The Review Team’s interviewees

¹⁶ <http://www.apo.org.au/research/one-biosecurity-working-partnership>

¹⁷ http://www.daff.gov.au/aqis/import/biological/faq#Where_and_how_do_I_get_these_government_veterinary_certifications

Issue 2: Exporter assurances

discussed examples of evidence of deteriorating standards detected in the past, including:

- the provision of false certification by the competent authority
- the provision of false manufacturer declarations by exporters to Australia,
- Australian inspections revealing failure by exporters to comply with import conditions (such as processing or packaging), or
- failure or delay by national governments in reporting a disease event in their country.

Even routine trade can present FMD risk if inadequate or out of date assurance is provided by the authorities in exporting countries. Excessive reliance on the FMD recognition system of the World Organisation for Animal Health (OIE) for determining a country or zone's FMD status should be avoided, as the system does not include any in-country verification of the FMD status claims submitted to the OIE, or allow third party access to country submissions and their evaluation.

A detailed evaluation by Australia of a country's FMD animal health controls and certification systems will often be warranted before acceptance of any claim concerning FMD status, and robust evaluation will usually require an in-country verification visit.

CONCLUSION

The pre-border risk of FMD entering Australia is increased by unreliable documentation, and advice provided by overseas competent authorities and exporters not operating to Australian standards.

The Review Team considers there is a need for Australia to be more proactive in monitoring conditions in exporting countries. This will identify trends towards deteriorating administrative standards that reduce the quality of assurances given for exports. A watch-list of less reliable exporter assurances should be assembled and maintained. This would be consistent with the Review Team's new policy direction number (4)—more rigorous application of the risk-return principle.

There would be benefits also from a program to systematically examine exporting countries—both their competent authorities and exporting firms—on a regular basis, outside any indications of problems. There may be scope for efficiencies if arrangements are made with (suitable) other importing countries to share information about a third country's performance.

RECOMMENDATIONS

The Review Team recommends that:

1. A program of regular and periodic reviews of overseas competent authorities and exporters should be developed. Where warranted, in-country verification should be undertaken.

Issue 2: Exporter assurances

2. Targeted statistical collection of data and the use of intelligence (as discussed at Issue 1) should be adopted into import business processes to inform decisions on priority targets for review.

Issue 3: The possibility of illegal importation of animal products

While Australian biosecurity systems deal with the risks associated with legally imported and declared quarantine products, illegally imported products are by definition not subject to the same safeguards. Australia has in place regulatory and inspection systems to intercept quarantine risk products at the border and the Review Team found that these were substantially effective. However, in the particular case of sea cargo, the system maintains a strong reliance on importers and their agents accurately declaring such products. While certain systems are in place to verify that products have been accurately declared, the scale of this verification is limited, and its scope is largely restricted to products known to be of some quarantine concern. Current arrangements also have deficiencies in their ability to identify and target higher quarantine risk importers, exporters to Australia, agents, transporters and product types (for example, refrigerated cargo).

DISCUSSION

The keystone of Australia's quarantine management of the risk of FMD is that certain animal products may legally be imported only from countries free of FMD. For this approach to be effective however, it requires the provision of truthful and accurate documentation from importers, suppliers and manufacturers.

Currently, importers and their agents are responsible for providing customs import declarations and any additional documentation (such as exporting country certificates and exporter declarations) required by Australian quarantine law for the imported product. Decisions to conduct a quarantine inspection at the Australian border are, in the first instance, based on whether import declarations and documentation identify a product of being of quarantine interest.

As physical inspection of all refrigerated containerised cargo (the type of cargo most likely to carry FMD-infected animal product such as pig meat) is impracticable, a compliance-based regulatory system is used to provide an acceptable level of assurance. This system uses random and targeted compliance sampling regimes which are based (in part) on risk management principles.

While there are systems in place to verify imported cargo's quarantine compliance, the scale of verification by inspection is limited (by resources, daily work pressures and available intelligence), and its scope is largely restricted to products already voluntarily declared as being of potential quarantine risk. This creates the opportunity for dishonest importers to falsely declare, or simply not declare, prohibited animal products to avoid their products being directed to AQIS for inspection.

In 2010 an AQIS investigation revealed illegal importation of a substantial amount of animal product (including pig meat products) from South Korea, during which time South Korea was experiencing an extensive outbreak of FMD. The operation uncovered a long-term, established supply chain dedicated to the illegal importation of pig meat into Australia, which involved importers, brokers and the operators of Quarantine Approved Premises. The case has been treated as a top priority considering that illegal smuggling of animal products is thought to have caused a

number of FMD outbreaks around the world, including the devastating outbreak in the United Kingdom in 2001.

The Review Team identified eight issues for management of this risk.

Brokers and accreditation

With over 1.9 million shipping containers arriving in Australia each year, DAFF is heavily reliant on the service of customs brokers in processing import documentation. This makes broker performance management a critical component of quarantine control. One of DAFF's co-regulatory schemes—the Broker Accreditation Scheme —allows accredited persons to assess import documents (such as permits and required certification) on AQIS' behalf.¹⁸

While brokers are licensed by Australian Customs, under the Broker Accreditation Scheme brokers benefit from accreditation by being able to direct incoming goods themselves (i.e. authorise the movement of goods) without the need to send documents to AQIS and wait for one of its officers to process the clearance. Instead, accredited brokers assess import documents for quarantine concerns, and can select the type of processing for any treatments or inspections required, along with their choice of administering Quarantine Approved Premises.

In the Review Team's view, tighter controls on broker accreditation and performance would help to improve the level of assurance, as would a system of physical checks sufficient to monitor the performance and integrity of individual brokers. Essentially, an enhanced control system—including an enhanced compliance program and effective sanctions for non-compliance—is required to overcome deliberate wrongdoing by brokers.

Quarantine approved premises

The Review Team considers that arrangements similar to those recommended to apply in future to brokers should also apply to Quarantine Approved Premises (QAPs). QAPs are places where cargo and containers undergo post-entry quarantine checks—including inspection—that prevent the introduction of exotic pests and diseases.¹⁹ While DAFF audits QAPs for compliance, auditing is constrained by resources, daily work pressures and the large number of QAPs (over 3000 nationally). Presently, no qualifications or professional probity standards are required to operate a QAP. There is little doubt that a small number of QAPs have been actively involved in the illegal activity uncovered through the 2010 AQIS operation. Thus, for tighter control, the same sort of auditing, controls and sanctions

¹⁸ <http://www.daff.gov.au/aqis/import/general-info/co-reg/ccc>

¹⁹ <http://www.daff.gov.au/aqis/import/general-info/qap>

proposed for brokers should also be applied to the owners/operators of QAPs. Again, targeting should be informed by intelligence and risk profiles based on performance checks.

Import documentation

Compliance investigations conducted by AQIS have detected fraudulent, false or misleading manufacturer declarations, along with blank invoices or manufacturer declarations being used to create two sets of documents—one false or misleading set for presentation to AQIS and a second, accurate set for commercial use. Many of these false declarations are not issued by the manufacturer but by a freight forwarder or trading company, and the documents prepared for AQIS typically reflect what is permitted for import into Australia rather than what is genuinely contained. Other documents describe or classify import products in terms less likely to invite quarantine inspection.

Forgery of required import documents (such as inspection and sanitary certificates) is also increasing, both in incidence and sophistication.

Some electronic Integrated Cargo System processes are also vulnerable to misuse.²⁰ For example, it is known that a number of importers register multiple supplier codes for the same supplier in the Integrated Cargo System, or multiple business names for the same entity, in an effort to minimise exposure to compliance systems. Such practices make it more difficult to profile and regulate specific importers.

Greater use of physical checks to validate documentary-based controls would enable more systematic risk-based assessment, or profiling, for quarantine compliance based on country of origin, importer and exporter, broker and past quarantine performance.

While the Australian Customs and Border Protection Service (Customs) undertakes a number of checks to verify import compliance and the validity of formal import declarations lodged with its electronic Integrated Cargo System, quarantine issues are not its primary focus. DAFF is seeking to work more closely with Customs on border integrity issues, including how to use the Customs systems to more effectively target imports of potential quarantine concern.

The Review Team is aware that ad hoc efforts have along these lines have been pursued on and off for many years. The team recommends that DAFF consider approaching Customs proposing the establishment of a formal joint agency reform team working to results-oriented terms of reference with timelines. The reform team should be accountable to senior management of both agencies for real progress. This

²⁰ <http://www.cargosupport.gov.au/site/page5950.asp>

would be consistent with the Review Team's new policy direction number (3)—the need to institutionalise processes to drive continuing refinement of FMD countermeasures.

Refrigerated containers

Refrigerated containers are the type of cargo most likely to contain animal products, and thus FMD risk. However, refrigerated containers are not subject to the same frequency of physical inspection as other imports, so there is less prospect of validating their contents. As a consequence, the system provides the opportunity for unscrupulous importers to smuggle prohibited animal products into Australia by falsely declaring the contents of refrigerated containers to avoid inspection.

Risk-based inspection

The Nairn Report and other reviews have argued that quarantine inspection is more efficient and effective if targeted towards higher risk importers, exporters, products and pathways.²¹

However, in 2001—in response to the United Kingdom FMD outbreak—mandated border inspection targets were implemented in Australia under what is referred to as the Increased Quarantine Intervention scheme. These targets remained unchanged for over seven years and were not based on a formal risk analysis for FMD, but only a broad assessment. Targets for sea cargo containers were restricted to external inspection (for potentially infected soil and organic matter). A number of targets have now been identified as both ineffective and inefficient in terms of risk-return, such as the requirement for inspection of all arriving passengers, regardless of their country of origin or its disease status.²²

DAFF is now beginning to move toward risk-based inspection, with effort progressively reallocated. A growing number of profiles and targets are being created based on better data and analysis. The Review Team supports these efforts and encourages DAFF to move quicker, including setting out a firm timeframe to complete the process of operational transformation to a fully risk-based system.

The import clearance effectiveness program

During a random inspection in 2010, AQIS found illegally imported animal product from South Korea—a country subject to FMD.

A subsequent national investigation uncovered a network of importers and QAPs involved in deliberate unlawful importation and distribution (for retail sale) of

²¹ http://daff.gov.au/_data/assets/pdf_file/0010/931609/report-single.pdf

²² http://daff.gov.au/_data/assets/pdf_file/0010/931609/report-single.pdf

Issue 3: Possibility of Illegal importation of animal products

significant amounts of prohibited food items from Korea. The investigation also suggested that the large demand and profit margins for these goods make future attempts at illegal importation likely.

The import clearance effectiveness (ICE) program undertakes targeted inspections—such as supervised unpacking of containers—to verify the effectiveness of import risk profiling mechanisms and documentary assessment procedures.

The unearthing of large scale illegal importation of animal products provides a strong argument for an intensification of ICE activities and further developing the ICE function along the lines of an audit-based system. The Review Team understands that a proposal is being developed to substantially strengthen the operation of ICE.

The Review Team supports the proposal, including initiatives encompassing:

- resourcing
- extrapolation to other imports in the same class as well as other import classes
- early action to determine risk elsewhere
- ensuring that ICE adds maximum value as an audit, investigation and information gathering tool that can assist risk-based targeting of products, pathways, and exporters and importers.

Container bypass of quarantine checks

A rural tailgate inspection is performed by AQIS officers on containers headed for rural destinations, and involves an external inspection of the container and a visual verification of the container and goods through opened container doors.

A proportion of carriers directed to submit containers to a rural tailgate inspection bypass this check and instead deliver the goods direct to a retail outlet. Under current legislation, the responsibility for such a bypass can be avoided. In addition, rural tailgate inspection presents an opportunity for illegally imported goods to be removed from containers before quarantine officers can be present to supervise unpacking.

Statistical records show that tailgate inspections currently have a very low effectiveness in detecting noncompliance, and the lack of control over containerised cargo proceeding to tailgate is likely to substantially reduce the effectiveness of this control.

In addition to the bypass of rural tailgate inspections, incidents revealing fraudulent duplication or manipulation of container seals also suggest that some importers are removing consignment goods between inspection points.

The Review Team considers that these weaknesses in the inspection system require attention.

CONCLUSION

From the issues identified above the Review Team concludes that illegal importation in its various forms is a continuing threat to Australia's biosecurity against FMD.

Issue 3: Possibility of Illegal importation of animal products

Because importers, brokers and others involved in the import process are well aware of how cargo import systems function, they can plan to avoid or minimise exposure to quarantine controls accordingly. The result can be serious non-compliance as detected by the 2010 AQIS Operation, and the creation of high-risk pathways for FMD entry to Australia.

RECOMMENDATIONS

The following recommendations aim to address the main systemic issues to FMD entry through illegal importation, and support the department's efforts in focusing resources on the areas of highest risk.

The Review Team recommends that:

1. DAFF set out a firm timeframe to complete as soon as possible the current process of operational transformation to a fully risk-based system of quarantine inspection priorities at the border. Priorities need to be continually updated to better target higher quarantine risk importers, exporters, source countries, agents, transporters and product types (for example, refrigerated cargo).
2. The integrity of the Broker Accreditation Scheme should be enhanced through a program of more frequent audits—including physical inspections of cargo to ensure compliance. The frequency of such audits should be both performance-based and risk-based. Thus, the broker's history of compliance and the inherent risk posed by the types of products being imported will determine audit frequency. A system of effective sanctions for non-compliance should be developed and publicised including summary withdrawal of accreditation.
3. The integrity of arrangements for Quarantine Approved Premises (QAP) should be tightened by requiring QAP operators to meet fit and proper person standards, and by increasing the frequency of audits according to quarantine risk and past QAP operator performance. Again, a system of effective sanctions for non-compliance should be developed and publicised including summary withdrawal of accreditation.
4. The veracity of import documentation presented to quarantine officers should be more systematically verified where such documentation provides crucial assurances for high quarantine risk imports. Because resources are limited, such systematic checks should be risk based: on both the history of compliant performance by document providers, and the level of risk tied to the country of origin, product, exporter, broker and importer.
5. The ICE system should be applied more regularly to refrigerated containers, with more frequent risk-based inspections, and inspections that confirm seals are intact (that the container has not been opened prior to inspection). The current DAFF-proposed improvements to the ICE system should be progressed as a matter of priority, with the system becoming a more

Issue 3: Possibility of Illegal importation of animal products

independent, evaluative and audit-based system, less dependent on inspection operations staff.

6. The incidence of rural tailgate inspection bypasses should be reduced by clearly establishing—if necessary through legislative change—the party responsible for complying with the quarantine inspection direction, and by establishing effective sanctions for non-compliance.
7. Closer collaboration with Customs should be encouraged, including collaboration on how to use Customs systems to more effectively target imports of potential quarantine concern. The team recommends that DAFF consider approaching Customs proposing the establishment of a joint agency reform team working to results-oriented terms of reference with timelines. The reform team should be accountable to senior management of both agencies for real progress.

Issue 4: The effectiveness of swill feeding prohibitions

The feeding of swill (food waste, garbage or other products likely to contain unsterilised meat) to pigs provides the most viable and likely opportunity for the FMD virus to establish in Australia. This is because in order to establish in Australia, the FMD virus must not only bypass Australia's quarantine border controls but must also be exposed to a susceptible host. Most of the FMD risk materials that might enter Australia are likely to be in the form of illegally imported meat products, and overseas experience shows that pigs are the most likely animals to become exposed and infected due to their omnivorous (eating both meat and plant products) habits. This is why swill feeding is illegal in all states and territories of Australia. However there are problems with the effectiveness and enforcement of the ban among peri-urban and smallholder farmers. This is concerning, given the experiences of other countries where swill feeding of pigs has led to FMD incursions.

DISCUSSION

Swill feeding is illegal in all jurisdictions in Australia. However there are problems with awareness and enforcement of the ban among peri-urban and small-scale farmers (non-commercial smallholders).²³ Evidence suggests (see below) that swill-feeding of pigs still occurs in a number of smallholder pig farms in Australia. Furthermore, swill-feeders are less likely to report sick animals to authorities.

Swill feeding provides a critical opportunity for the establishment of the FMD virus. Pigs are relatively susceptible to FMD infection by the oral route. Unlike other susceptible but herbivorous animals, pigs are more likely to be exposed to and ingest products containing the virus. Since infected imported meat/dairy products are more likely to avoid quarantine detection than live animals, and most likely to be subsequently fed to pigs, swill feeding poses the most significant risk for establishment of the disease in Australia following its entry.

As pigs excrete about a thousand times more virus in expired air (aerosols) than do ruminants, it is likely that FMD, once established as a result of pig swill-feeding practices, could spread to nearby livestock and become well-established before being detected and reported.²⁴ This is consistent with the experiences of other

²³ N Schembri, M Hernández-Jover, JA Toribio and PK Holyoake. Feeding of prohibited substances (swill) to pigs in Australia. Australian Veterinary Journal. Vol 88, No. 8, August 2010.

²⁴ http://www.animalhealthaustralia.com.au/wp-content/uploads/2011/04/FMD3_2-12-FINAL6May10.pdf

Issue 4: Effectiveness of swill feeding prohibitions

countries where swill feeding of pigs has been the cause of major FMD outbreaks, including the devastating outbreak of 2001 in the United Kingdom. In that case, illegally imported FMD infected meat was fed to pigs as swill. Sufficient amounts of aerosols were then produced by the infected piggery herd to infect nearby flocks of sheep that were then moved to markets with infected animals subsequently being dispersed around the country.²⁵ Additionally, the producer involved in the United Kingdom outbreak was licensed under a national scheme to feed ‘treated swill’ to pigs, but clearly the swill had not been treated or had been inadequately treated to inactivate the virus. Some states in Australia also have legislated provisions allowing licensed producers limited feeding of some categories of food waste or by-products. The Review Team considers this a dangerous provision—particularly in the absence of related enforcement and compliance programs—which should be removed.

While the current controls in Australia have the right intent, more needs to be done both at the state and national levels to ensure that the policing and enforcement of such controls, particularly among smallholders, are carried out to a level proportionate to the risk posed by the feeding of swill.

State and territory laws banning swill feeding are not consistent and are also difficult to enforce. Thus, a study of swill feeding in Australia found:

‘...inconsistencies in state legislation and policy for registering livestock holdings and identifying weaner pigs. This situation is confusing for producers and leads to a higher biosecurity risk.

The definition of feedstuffs classified as ‘swill’ varied among states, and the approaches toward undertaking swill feeding investigations are also inconsistent.

Producers with fewer than 150 sows have less: (1) on-farm biosecurity practices, (2) disease knowledge, (3) understanding of swill feeding and (4) veterinary contact—than producers with 150 sows or more.

The majority of smallholder producers are not members of a representative body, making locating and communicating with them a greater challenge than for larger scale producers.’²⁶

²⁵ E Barclay (2005) Local community preparedness for an Emergency Animal Disease outbreak. RIRDC, Canberra. <https://rirdc.infoservices.com.au/downloads/05-131>

²⁶ N Schembri, M Hernández-Jover, JA Toribio and PK Holyoake. Feeding of prohibited substances (swill) to pigs in Australia. Australian Veterinary Journal. Vol 88, No. 8, August 2010.

Issue 4: Effectiveness of swill feeding prohibitions

For these reasons among others, a generic import risk assessment conducted by DAFF concluded that the feeding practices of smallholder and backyard pig producers would lead to a 'high' annual likelihood of FMD exposure for Australia.²⁷

Further supporting this view is a 2006 New South Wales report which found that government authorities had a low level of awareness of illegal feeding practices by backyard and small-scale producers.²⁸

Additional recent research also supports the view that enforcement of the swill feeding ban is poor in Australia. A 2010 University of Sydney study identified small-holder confusion surrounding the definition of swill, despite extension activities being undertaken in all states. The study concluded that extension activities were not changing the swill feeding behaviour of small-holder producers.²⁹

Against this background the Review Team is concerned that the number of compliance visits in 2010 reported to Animal Health Committee is low in some states.³⁰ Despite some low inspection rates, four swill feeding prosecutions occurred in Australia in 2006, three in 2008 and two in 2010. These prosecutions indicate that swill feeding activity is continuing risk that needs to be addressed.

Compounding the lack of information about swill feeding activity is the absence of information on small pig holdings held on jurisdictional livestock-holding databases. This information gap means that authorities have a poor understanding of how many small-holders exist and where they are located; this gap is important not only for swill feeding regulation, but of critical importance in the event of an FMD emergency. The Review Team considers that a national registration system that records the location of all small-holdings is necessary, and could be used to effectively target inspection and enforcement programs on small-holdings identified as higher-risk (for example, small-holdings in areas near high-density commercial livestock holdings).

Nationally, the Animal Health Committee is progressing changes to swill feeding legislation to improve consistency across jurisdictions. However, these processes have been slow and speedier action is required. Given the serious and national level risks posed by the practice of swill feeding, the Australian Government should

²⁷ DAFF. Generic Import Risk Analysis (IRA) for Pig Meat: Final Import Risk Analysis Report: Biosecurity Australia, 2004. http://www.daff.gov.au/__data/assets/pdf_file/0014/11930/2004-01a.pdf

²⁸ N Schembri, K Hart, R Petersen, R Whittington. Assessment of the management practices facilitating the establishment and spread of exotic diseases of pigs in the Sydney region. *Australian Veterinary Journal*. Vol 84, No.10, October 2006.

²⁹ Schembri et al., 2010

³⁰ AHC out of session papers, Meeting 19, 22-24 March 2011.

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further support this important work by collaborating with the states and territories to implement a national campaign and ongoing program aimed at increasing awareness, compliance and enforcement of swill-feeding prohibitions.

CONCLUSION

Swill feeding provides the most viable opportunity for the FMD virus—once imported—to establish in Australia. In the Review Team’s view, the current level of government intervention is not commensurate with the risk posed by a practice which evidence suggests is still occurring. It is important that national action to raise awareness and enforce the ban on swill feeding, particularly among small-holders, be more resolute and rapid.

RECOMMENDATIONS

The Review Team recommends that:

1. The Australian Government, in collaboration with the states and territories, implement a national campaign aimed at:
 - increasing awareness of swill feeding prohibitions amongst small-holder producers (including non-English speaking communities) and high-risk areas within each state
 - increasing investigations targeted at high-risk areas
 - harmonising legislation across all jurisdictions.
2. A national registration system is established that records the location of all small-holdings and is used to target inspection and enforcement programs (by identifying higher-risk small-holdings with proximity to high-density commercial livestock holdings).
3. The legislated provisions in some jurisdictions allowing licensed producers to feed ‘treated’ swill should be removed.
4. A national swill feeding investigation and reporting system be adopted that includes uniform inspection procedures, and communicates swill feeding investigation outcomes to central organisation such as AHA and the DAFF Foresighting Unit recommended in Issue 1.
5. AHC urgently finalise its work on swill feeding as a national priority with the support of the Australian Government.

Issue 5: Australia's national capacity to mount and sustain an effective response to a large-scale FMD outbreak

The Review Team found that Australia does not currently have the capacity that would be required to mount and sustain an effective response to a medium-to-large outbreak of FMD. Experience gained from real emergency disease responses such as the 2007 outbreak of equine influenza, and from simulation exercises such as Exercise Minotaur and DIVA, provides strong evidence that Australia does not have sufficient suitable human resources to manage anything other than a small FMD incursion.

Overseas experience has clearly demonstrated that mounting a successful response to a significant FMD incursion requires considerable resources sustained over a considerable period of time. Australia has done little to address the known capacity shortfalls in its emergency animal disease response capacity.

Failure to address these deficiencies in Australia's ability to resource a sustained response will result in systems and people quickly becoming overwhelmed, the crisis escalating, and a failure to control or contain the disease.

DISCUSSION

There is considerable evidence of Australia's current resource shortfall for emergency animal disease responses.

The review published by Animal Health Australia of the 2007 response to equine influenza demonstrated numerous strengths of Australia's disease preparedness arrangements.³¹ However, it also identified many aspects that require attention to improve Australia's likelihood of successfully managing a future large scale outbreak of disease.

Importantly, the review reported that:

'...under current preparedness arrangements and with existing resources, Australia would experience a significant challenge in mounting an effective response to an outbreak any larger or more complex than that experienced with equine influenza.'³²

³¹ Animal Health Australia. Report of the National Review of Australia's Response to the 2007 outbreak of equine influenza. Animal Health Australia, Canberra, March 2009

³² Animal Health Australia. Report of the National Review of Australia's Response to the 2007 outbreak of equine influenza. Animal Health Australia, Canberra, March 2009, p41.

Issue 5: Australia's national capacity to mount a sustained large-scale response

This statement is particularly concerning when considering the differences between equine influenza and FMD. Equine influenza is a relatively mild disease affecting only one host species, and the 2007 outbreak directly affected only two states. Additionally the equine influenza response did not require the destruction and disposal of animals as a control measure, which is likely to be a prominent feature of an FMD response. FMD would also affect multiple species and industry sectors, and thus require substantially more resources to mount an effective response. While infection with equine influenza is resolved after several weeks, FMD has substantial ongoing requirements for valuation, destruction, disposal and compensation, and for surveillance and property management requirements. Unlike equine influenza, FMD also has major implications for continuing trade in livestock and their products, and could severely impact the Australian economy.³³ These differences indicate a need for planning, resources and investment substantially beyond current levels.

This review also noted that:

*'...The experience provided by the Australian equine influenza response and comparison with other experiences of FMD indicate **Australia may be under-resourced to respond to even a moderate outbreak of FMD.** This comparison highlights the importance of comprehensively and effectively addressing the challenges associated with the availability of resources and the way personnel are trained to participate in a response.'*³⁴

The Australian Government Department of Agriculture, Fisheries and Forestry reported in its internal review of the department's response to equine influenza (EI), that:

*'...from the outset, the sheer scale and duration of the EI response demanded the need for increasing human resource capacity and use of all available national resources.'*³⁵

And that:

'Despite the effectiveness of the national coordination process, the department identified early in the response serious shortages in available human resources nationally to undertake specialist and technical roles including epidemiology,

³³ ibid

³⁴ ibid

³⁵ ibid

*veterinary investigations, tracing and surveillance, vaccination, laboratory and field roles.*³⁶

The Exercise Minotaur report—following a week-long, nation-wide disease simulation exercise conducted between 8–13 September 2002—recommended that resources issues be addressed by jurisdictions as a matter of urgency, as it was clearly established during the exercise, that the duration of an outbreak will be directly related to the ability to rapidly deploy large numbers of appropriate personnel at the initial stage of the response.³⁷ The exercise also concluded that the spread and duration of an FMD outbreak will be substantially extended and the consequences intensified if large numbers of resources are not deployed immediately.³⁸

Despite the above extensive evidence that Australia currently lacks the surge capacity of human resources that will be required for an outbreak of the possible scale of FMD, the Review Team found that little has been done to address these known shortfalls in Australia's response capacity. (This lack of response may be related to the Review Team's earlier finding that accountability for driving action is sometimes diluted by collective national planning processes.)

In fact since the outbreak of equine influenza in 2007 there are indications that overall resources committed to national animal health and biosecurity in Australia have declined in real terms, as evidenced by closure of a number of state laboratories, and reduced employment of government veterinarians and industry liaison officers in the states and territories.

The review published by Animal Health Australia of the 2007 response to equine influenza concluded that declining government expenditure and commitment to emergency animal disease preparedness has resulted in training and development programs (for both core personnel and those who receive 'just in time' training) lacking the level of continuity required to enable all key sectors of the community to respond in an optimal manner.³⁹

Planning assumptions

Despite fairly detailed and comprehensive consideration of the potential resources required during an FMD response, the United Kingdom was almost immediately

³⁶ *ibid*

³⁷ http://www.daff.gov.au/_data/assets/pdf_file/0005/146831/minotaurreport.pdf (p47)

³⁸ http://www.daff.gov.au/_data/assets/pdf_file/0005/146831/minotaurreport.pdf

³⁹ Animal Health Australia. Report of the National Review of Australia's Response to the 2007 outbreak of equine influenza. Animal Health Australia, Canberra, March 2009, p41.

overwhelmed, and lacked the scale of resources (both veterinary and other skilled professionals) to deal effectively with the outbreak that confronted them.

Contingency plans in the United Kingdom were based on European Union guidelines suggesting that Member States should have the resources to deal with up to 10 simultaneously infected premises.⁴⁰ They also included the assumption that each single infected premise requires, as a minimum, a vet supported by a two-person team. After working at the infected farm, the team is classed as 'dirty' and has to be stood down for a period of time. Additionally, it was considered that the original infected premises would generate a further set of farms to be traced and checked, each requiring yet another veterinary team. There were also extra provisions planned for early in the outbreak when two or three other infected premises might be added each day.

Based on this guidance, officials estimated that a severe-case scenario in the United Kingdom would need 235 veterinary officers, and in a more extensive outbreak, the number of staff needed might rise to 300. In the event, when FMD broke out in 2001, at least 57 premises were infected before the initial diagnosis was made. All State Veterinary Service resources were fully utilised almost immediately. During the course of the outbreak, over 2500 Temporary Veterinary Inspectors were appointed, with nearly 70 from abroad. A further 700 foreign government vets and other secondees assisted on a temporary basis.⁴¹

The United Kingdom was left unprepared, then, by its planning prior to the 2001 incursion which failed to anticipate the demands of a large-scale outbreak, or of how plans might be escalated. Better scenario planning would have left the State Veterinary Service more able to cope with the severity of the outbreak that it eventually faced. The lesson learnt by the United Kingdom was that planning must deal explicitly with the challenges of scaling-up.⁴²

Australian contingency plans are not currently underpinned by guidance such as that issued to member states by the European Union. Instead jurisdictions base their resource estimates on what will be required to staff local and state disease control

⁴⁰ *Foot and Mouth Disease 2001: Lessons to be Learned Inquiry Report*, http://webarchive.nationalarchives.gov.uk/20100807034701/http://archive.cabinetoffice.gov.uk/fmd/fmd_report/report/index.htm

⁴¹ *ibid*

⁴² *Foot and Mouth Disease 2001: Lessons to be Learned Inquiry Report*, http://webarchive.nationalarchives.gov.uk/20100807034701/http://archive.cabinetoffice.gov.uk/fmd/fmd_report/report/index.htm

centres. However, given what is known about the current shortfalls in Australian capacity for emergency animal disease responses, it is likely that Australia is under-prepared in this regard and could suffer an experience similar to the United Kingdom should an FMD outbreak occur.

The Review Team considers that better national guidance on resource requirements should be developed for Australia. In the meantime each jurisdiction should calculate the potential resources required to respond to a severe outbreak scenario of disease taking into account livestock populations of species likely to be affected in each state. A national stocktake of current resource capacity should then be undertaken, benchmarking the number of trained personnel (veterinary and other professionals) in each state that would be available immediately, after one month, and after two months, to contribute to a FMD response effort. The stocktake should assess the potential time lags between request for resources and their actual deployment, and should take account of the full suite of skills likely to be required. Strategies to address specific gaps should then be developed on both a state and national basis. Consistent with the Review Team's recommended new policy direction number (1), the Australian Government should take a leadership role in coordinating this work.

Veterinary services

A nation's veterinary service provides the backbone for effective animal health and disease control, and is one of the most telling indicators of a country's preparedness and ability to manage an emergency animal disease. Maintaining a strong veterinary service should therefore be a high priority.

The OIE states that:

*'Veterinary services are at the very core of prevention, control and eradication of animal diseases. As such, their ability to effectively safeguard the livestock sector from such diseases will be crucial for the protection both of public health and of rural livelihoods.'*⁴³

Substandard veterinary services pose a very real threat to the prevention and control of diseases such as FMD. In the OIE's economic analysis of prevention versus outbreak costs of animal disease worldwide, it was found that the weaknesses in

⁴³ OIE. Prevention, detection, and control of animal diseases, including zoonoses: Veterinary Services, the core of the global system. December 2005.

http://web.oie.int/downld/Prep_conf_Avian_inf/Divers_meeting/10-%20Editorial%20Vet%20services_15%20Mar%2006.pdf

veterinary services essentially arise from continued underinvestment and prioritisation of veterinary services against other priorities for public funding.

The Review Team considers that an assessment of Australian capacity should be undertaken, using the internationally recognised OIE Performance of Veterinary Services tool, to benchmark Australia's veterinary services against international standards, and identify key gaps and critical areas requiring attention. Consistent with the Review Team's new policy direction number (3)—the need to institutionalise processes to focus policy makers' attention to continuing refinement and strengthening into the future)—the outcome of this assessment should be brought back to the Primary Industries Ministerial Council to consider the future development of state and national veterinary services, and measures for maintenance of Australia's veterinary services should be incorporated in the business plans and performance indicators of the Office of the Australian Chief Veterinary Officer and state equivalents.

In addition to vets

One of the biggest challenges in emergency management is to ensure that the right people with the right skills are in the right places at the right time. Effective surge capacity planning must cover all aspects of emergency resourcing, including for example: recruitment and training of staff; human resource management, deployment of systems for administration and information management; procurement and sourcing of goods and services; financial administration, and communications.

During the 2001 FMD outbreak, the United Kingdom found very early on that the shortage of human resources was not only confined to a lack of vets. Rather, there were also important gaps in laboratory technician, managerial, communications, administrative and logistical skills.⁴⁴

Efforts were made in the United Kingdom outbreak to allocate non-veterinary tasks to other staff to enable vets to concentrate on core veterinary tasks. However, many non-veterinary tasks still had to be carried out by the scarcest resource of all—the veterinarians themselves. By the beginning of March 2001, there was considerable pressure to ensure the availability of non-veterinary staff with a wide range of skills—a development for which it appeared the United Kingdom was not prepared. The responsible agency was heavily criticised for the clear lack of systematic planning and effort to acquire additional non-veterinary resources.⁴⁵ This highlights the importance of defining—in peace time—the requirements of an emergency animal

⁴⁴ Foot and Mouth Disease 2001: Lessons to be Learned Inquiry Report, 2002.

⁴⁵ *ibid*

disease response that must be undertaken by veterinary professionals, as distinct from those activities that could or should be undertaken by others.

During the equine influenza outbreak in Australia, response managers reported consistent difficulty in locating and engaging suitable staff trained in emergency animal disease response for both specialist and management roles.⁴⁶ This shortage adversely affected the quality of the response and the speed with which response actions could be implemented.

In some instances during the equine influenza outbreak, managers were unfamiliar with response strategies and lacked an understanding of emergency animal diseases and emergency procedures.⁴⁷ As a result, lines of command and control were exposed on a number of occasions and response activities impeded. Frequently, given the shortage of trained staff and the urgency to fill some roles, people were assigned to roles for which they were untrained or lacked sufficient knowledge or experience.⁴⁸

The Review Team has found that more substantive contingency planning needs to be done for resourcing the complete suite of all functions that will be required during an emergency. A national register of competent and skilled professionals should be established and maintained by the Australian Government or Animal Health Australia. The register should record the details of individuals willing to be called upon in a response, matching their skills to the functions that will be required. The register should maintain a distinct list of the roles and tasks that will need to be done by veterinary professionals.

Communications resources

Exercise DIVA reiterated a key learning from Australia's equine influenza experience; that significant human resources will be needed to maintain effective communication with a large and diverse audience during an FMD response. The review of the exercise suggested that more planning is required to determine how a 24 hour news cycle would be managed with currently available resources.

Any future FMD outbreak will also almost certainly have to deal with challenges posed by contemporary social media. However the very same social media also provides opportunities to better manage communication and public involvement in

⁴⁶ WR Webster (2011) The August 2007 equine influenza response management framework. Australian Veterinary Journal Supplement: Equine Influenza in Australia in 2007: 92-7.

⁴⁷ Animal Health Australia. Report of the National Review of Australia's Response to the 2007 outbreak of equine influenza. Animal Health Australia, Canberra, March 2009, p42.

⁴⁸ WR Webster (2011) The August 2007 equine influenza response management framework. Australian Veterinary Journal Supplement: Equine Influenza in Australia in 2007: 92-7.

the response. The Victorian Department of Health has a social media policy which recognises that staff and business units will increasingly be using social media to interact with each other and the community.⁴⁹ The policy provides a safe framework for online participation by representatives of the government.

The Review Team suggests that DAFF, in conjunction with the states and territories, investigate how contemporary social media can be used to contribute to the communication objectives of an FMD response effort. Current communications plans, which pay little attention to the new media, should then be revisited and updated, along with contingency plans to ensure that skilled communications professionals will be available when required.

Social media

As the Queensland flood crisis worsened, the Queensland Police Service used social media tools Facebook, Twitter and YouTube to get its message to the public directly. Road closure information and evacuation alerts were tweeted, which those without electricity could access via their mobile phones, along with the Queensland Police's Facebook page and streamed press conferences. Both tweets and Facebook were also used to dispel misinformation.

Queensland Police described the benefits of communicating directly with those in the crisis, rather than relying on traditional media, as greater control and timeliness. In contrast, calling media conferences and creating media releases, and preparing television or radio news bulletins, saw the police reliant on journalists and media management decisions about newsworthiness and timing.

⁴⁹ <http://www.egov.vic.gov.au/pdfs/dh-social-media-action-plan-part1-policy-updated-25-08-2010.pdf>

New technologies provide new crisis tools

The emergence of new electronic technologies and their associated methods of communication have been progressively adopted by government and the community.

The equine influenza response identified many situations where access to groups of individuals was difficult and, wherever possible, opportunities to use electronic methods were explored. A good example of this was monitoring and responding to blogs, which allowed the correction of misinformation circulating in the horse industry and provided updates to horse owners on the conduct of the response. It was an extremely useful mechanism for contacting people familiar with using the internet and computers for information sharing.

Other technologies applied included: the use of SMS messaging to contact and inform veterinary practitioners, a specialist e-publication AVR Intelligence that was provided daily to members of the AVR (and others), and the electronic distribution of situation reports to veterinarians and horse industry representatives.

Industry liaison officers

During the 2007 outbreak of equine influenza in Australia, industry liaison officers played an important role in communication.⁵⁰ They:

- contributed considerable credibility and knowledge to the response operation
- significantly contributed to awareness and mediation of the cultural differences between different sectors
- acted as a intermediary between horse owners and the response operation
- changed the perception of many that the response was a government (rather than shared) responsibility.

Industry liaison is vital to the emergency animal disease response plan and is covered in detail in AUSVETPLAN. However, the lessons learnt from the equine influenza response were that more individuals need industry liaison officer training in 'peacetime', and that just-in-time training packages require preparation and trial prior to outbreaks to be effective. The Review Team considers that the Australian Government in collaboration with the states and territories and Animal Health

⁵⁰ R Hoare & D Paxton (2011) Industry liaison officers in the infected states of Australia during the 2007 equine influenza outbreak. Australian Veterinary Journal Supplement: Equine Influenza in Australia in 2007:101-3.

Australia should support extended delivery of this important training as an ongoing priority.

Laboratory capacity

The Exercise Minotaur report found that the roles of state/territory laboratories and the Australian Animal Health Laboratory (AAHL) in an animal disease emergency need to be clarified. The Review Team, through discussions with laboratory staff around the country, found—nine years on from Exercise Minotaur—that this lack of clarity still remains.

The Review Team reiterates the necessity of establishing a clear and agreed policy on the respective roles of AAHL and state/territory laboratories during an FMD emergency. This should be progressed without delay. Consistent with new policy direction number (3)—the need to institutionalise processes to prompt continuous improvement—advice on these roles should be brought back to the Ministerial Council by a set date.

The human resource challenges (among others) faced by state laboratory staff in both New South Wales and Queensland during the equine influenza response indicate that if state laboratories are to be involved in FMD diagnosis during an emergency response, advance training and business continuity arrangements will be needed for effective functioning of the arrangement.⁵¹ There is also an on-going need to ensure AAHL and the state veterinary laboratories are equipped and resourced to be able to rapidly diagnose an emergency animal disease and achieve high specimen throughputs during an emergency animal disease response and for proof of freedom.⁵²

The Animal Health Committee's sub-committee on Animal Health Laboratory Standards established the Laboratories for Emergency Animal Disease Diagnosis and Response (LEADDR) to coordinate a national laboratory network operating on a partnership approach to provide quality assured and harmonised testing for selected emergency animal diseases. The objective of the network is to coordinate diagnostic and surge capacity for laboratory diagnostic testing during emergency animal disease outbreaks. To this end it aims to standardise or otherwise harmonise testing services and coordinate large-scale testing capacity to provide effective diagnosis and management of emergency disease outbreaks, and provide a network-supported national surge capacity for emergency animal disease diagnostics.

⁵¹ L Brown et al. (2011) Responding to the equine influenza outbreak: challenges from a laboratory perspective. Australian Veterinary Journal, Vol 89 Supplement: 32-5.

⁵² Animal Health Australia. Report of the National Review of Australia's Response to the 2007 outbreak of equine influenza. Animal Health Australia, Canberra, March 2009, p41

The Review Team recommends that LEADDR be tasked to:

- develop a nationally harmonised test for FMD (to be maintained and updated as necessary as technologies advance)
- establish a clear and agreed policy on the respective roles of AAHL and state/territory laboratories during an FMD emergency
- advise on training that needs to be provided
- advise of necessary equipment and associated business continuity arrangements that may be needed to ensure full scale-up of laboratory capacity is possible in the event of an FMD outbreak.

The latter would be consistent with the Review Team's new policy direction number (2)—more emphasis on preparedness. Consistent with the Review Team's new policy direction number (3)—the need to institutionalise processes to drive continuous improvements—the above report from LEADDR should be brought back to the Primary Industries Ministerial Council for decision.

Looking after people

During the United Kingdom 2001 FMD outbreak, people worked long and hard under very difficult circumstances to try to contain the disease and limit the consequences. Eventually, military forces were deployed to provide support and made an impressive contribution, providing leadership, management and logistical skills.

The outbreak was traumatic for many and some people sustained extreme working patterns, often 12 or more hours a day for seven days a week, for long periods. They absorbed a great deal of emotion from farmers and others who were in considerable distress. Many staff, often at quite junior levels, endured abuse and intimidation. There were cases of nervous breakdown, from which some people still suffer.⁵³

Training on how to cope with stress was patchy. As the outbreak progressed, counselling and welfare provision was made increasingly available. However, it was not until April—two months after the outbreak response began—that some managers acknowledged the need for staff to take a break from their duties.

Similarly, during the 2007 equine influenza outbreak in Australia, interviews conducted by the Review Team revealed that response staff in many areas quickly became fatigued as insufficient skilled personnel were available for shift rotations. This required essential expert staff to work excessively long hours for several weeks.

⁵³ Foot and Mouth Disease 2001: Lessons to be Learned Inquiry Report, 2002.

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Other departments with emergency management responsibilities (such as Emergency Management Australia) have addressed this issue. The Review Team recommends that Australian Government and state and territory agriculture department explore the Emergency Management Australia arrangements with a view to prescribing adequate provisions in existing departmental enterprise agreements, business continuity plans and emergency management plans. This will ensure staff are recognised and supported for their efforts made during a response to FMD.

Reliance on resources that proved to be unavailable

Australia has established pools of resources in an effort to deal with the surge requirements in an emergency animal disease response, and enable rapid deployment of personnel and ongoing support during an outbreak. However, in practice during the equine influenza outbreak of 2007, these arrangements proved to be problematic, and failed to provide the full extent of support that was originally intended.

Rapid Response Team

A program aimed at training personnel who can then be deployed during an emergency animal disease response was established by Animal Health Australia and its members in 2004. Known as the Rapid Response Team, the team was designed to provide specially trained personnel to assist with the establishment of Local Control Centres in the early stages of a response to an emergency animal disease.

However during the equine influenza response, the Rapid Response Team did not operate as expected, although it still provided many highly trained people who were valued in their assigned roles. Originally it had been assumed that Rapid Response Team members from non-infected jurisdictions would be readily available to be deployed. However requests made by the two infected jurisdictions were difficult to fulfil because the non-infected jurisdictions wished to retain experienced staff, including their rapid response team members, to assist with their own response activities.

Private practitioners / Australian veterinary reserve

During the equine influenza response, several issues were identified relating to the employment of staff in an emergency animal disease response.⁵⁴ These included

⁵⁴ Animal Health Australia. Report of the National Review of Australia's Response to the 2007 outbreak of equine influenza. Animal Health Australia, Canberra, March 2009, P43

conditions of employment, contracts and the constraints imposed by state legislative requirements.

Inconsistencies in the engagement, contracting, and remuneration of private veterinarians identified during the equine influenza response had the potential to alienate some members of the profession and reduce their willingness to engage in future emergency animal disease response activities. Mechanisms for engaging private veterinarians were inconsistent—and varied from the use of a recruitment firm, direct contract with individuals, engagement of veterinary practices to provide services, and other arrangements. The processes for procuring and delivering the necessary services from external sources during a crisis were also unclear to many government responders. Nor had these processes been tested prior to the equine influenza outbreak to ensure they could cope with unexpected increased demands.

Difficulties with the employment of private veterinarians during the response resulted from the level of remuneration offered, and differing scales of remuneration in neighbouring jurisdictions, leading to inequities.⁵⁵ Many veterinarians had concerns about employment conditions, especially insurance arrangements and reimbursement of essential travel costs. Obtaining suitable professional indemnity insurance cover at short notice for retired non-government veterinarians was a serious and often intractable problem. Professional indemnity insurance carried by private veterinary practitioners may not have provided adequate cover while they were engaged in duties associated with the emergency animal disease response.⁵⁶

There was also an issue with reluctance by some veterinarians to visit infected or potentially infected premises due to the recommendation that after a visit to a property with suspected cases of equine influenza, individuals should not visit another horse property for 24 hours.⁵⁷

The establishment of the Australian Veterinary Reserve (AVR) was one of the major recommendations of the *Review of Rural Veterinary Services Report*.⁵⁸ Launched in May 2004, the AVR involves 100 non-government veterinarians in government programs, initially by providing paid training in national emergency animal disease

⁵⁵ WR Webster (2011) The August 2007 equine influenza response management framework. Australian Veterinary Journal Supplement: Equine Influenza in Australia in 2007: 92-7.

⁵⁶ Animal Health Australia. Report of the National Review of Australia's Response to the 2007 outbreak of equine influenza. Animal Health Australia, Canberra, March 2009, p38.

⁵⁷ http://www.dpi.qld.gov.au/documents/Biosecurity_GeneralAnimalHealthPestsAndDiseases/DPIF-SurveillancePackage-QueenslandVets.pdf

⁵⁸ <http://www.ava.com.au/sites/default/files/documents/Other/Frawley%20report.pdf>

preparedness. The aim of the program was to provide a mechanism for private practitioners to be readily engaged to assist with an emergency disease response.

In practice however, there were significant issues associated with the availability of members of the AVR during the equine influenza outbreak in 2007. Though some individuals made significant contributions, many members of the AVR were not readily available as it was difficult to leave their practice at short notice. Additionally, the AVR members were also affected by the issues discussed above. Despite there being 98 AVR members at the time of the equine influenza outbreak, only 48 are known to have worked in the equine influenza response.⁵⁹

The use of volunteers

The use of volunteers in emergency events has grown in recent times as the value of tapping into this enthusiastic and willing sector has been better recognised. Policy frameworks, management protocols and guidelines have been developed in other government portfolios to support the engagement of community volunteers, and a significant amount of work has gone into programs for other emergencies that ensure that volunteers are sufficiently prepared and can be utilised at relatively short notice.

The Review Team considers this to be an area of potential to address some of the shortfalls in Australia's current emergency animal disease response capacity, not just in areas of veterinary science, but for all areas of a response where more hands on deck will be required to meet surge capacity needs.

The Review Team recommends that alliances be formed between governments and rural organisations, the private sector, producer groups and local community groups to explore innovative ways in which a volunteer program making use of local resources could be established to provide emergency reserves to contribute to an FMD response.

Agency personnel planning

The human resources manager at the United Kingdom's Department of Environment, Food and Rural Affairs (DEFRA) stated that the department had a 'silo mentality' during the 2001 FMD outbreak and individual groups and managers not directly involved with the outbreak remained focused on their own targets. There was no incentive for them to release staff to help in the fight against FMD. The Lessons Learned Inquiry considered it a serious shortcoming that there was no inbuilt process

⁵⁹ Animal Health Australia. Report of the National Review of Australia's Response to the 2007 outbreak of equine influenza. Animal Health Australia, Canberra, March 2009, p17.

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for senior management to reprioritise and reassign much-needed staff and other resources to the response effort.

A similar experience was seen in Australia during the equine influenza outbreak, where some managers in both state and federal departments were reluctant to release staff as there was no higher-level endorsement of the need for reprioritisation.

The Review Team considers that, consistent with new policy direction (2)—focussing on the preparedness end of the emergency management spectrum—arrangements should be settled well in advance in peace-time for the rapid prioritisation of the agency's work and the rapid reassignment of resources to assist the response. This agreement should be at the highest level within each state-level agriculture department and within DAFF—and reflected in agency business continuity and critical incident response plans.

Given that there is no certainty that an outbreak in Australia would be detected early (see Issue 9), contingency plans should be revisited to ensure that they include sufficient provision to deploy adequate resources immediately to attend a severe outbreak. Each state and territory should base its plans and resource needs on a severe-outbreak scenario occurring in areas of densely populated livestock.

CONCLUSION

There is longstanding evidence regarding Australia's likely challenges in providing human resources to deal with a sustained emergency animal disease outbreak. Better, but more conservative, national guidance on likely resource requirements in a severe case outbreak should be developed for Australia in a similar way to European guidance to member states. Comprehensive planning and high-level political commitment coupled with pre-prepared agency arrangements are required if necessary national surge capacity is to be available. Australia's capability and capacity to respond effectively to future emergency animal disease incursions depends on a continuum of planning, training and development activities to prepare government staff, veterinary practitioners, industry, and private sector service providers to be ready to respond. Continuing failure to address this issue risks a quickly overwhelmed emergency animal disease response workforce in an FMD outbreak situation, and a less effective response.

RECOMMENDATIONS

The Review Team recommends that:

1. Better national guidance on likely resource requirements in a severe case outbreak should be developed for Australia. In the meantime each jurisdiction should calculate the potential resources required to respond to a severe outbreak scenario of disease taking into account livestock populations of species likely to be affected in each state, and the range of functions that would be required in a response.

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A national stocktake of current resource capacity should then be undertaken, benchmarking the number of trained personnel (veterinary and other professionals) in each state. Consideration should be given to the resources that would be available at different intervals of the response (during and immediately following, after one month, and after two months) to contribute to a FMD response effort.

The stocktake should assess the potential time lags between request for resources and their actual deployment, and should take account of the full suite of skills likely to be required. Strategies to address specific gaps should then be developed on both a state and national basis.

2. Contingency plans in each jurisdiction should then be revisited to ensure the resource requirements can be met to respond to a severe scenario outbreak of FMD in a densely populated area of livestock—based on the assumption that the disease may not be immediately detected.
3. An assessment of Australian veterinary services should be undertaken, using the internationally recognised OIE Performance of Veterinary Services tool, to benchmark Australia's veterinary services against international standards, and identify key gaps and critical areas requiring attention. The assessment should be submitted to the Primary Industries Ministerial Council for consideration.
4. Following on from the OIE Performance of Veterinary Services assessment, measures for maintenance of Australia's veterinary services should be incorporated in the business plans and performance indicators of the Office of the Australian Chief Veterinary Officer and state counterparts.
5. More substantive contingency planning should be undertaken for resourcing the complete suite of all functions that will be required during an emergency. A national register of skilled professionals should be established and maintained by the Australian Government or Animal Health Australia. The register should record the details of individuals willing to be called upon in a response, matching their skills to the functions that will be required. The process should differentiate between the roles and tasks that will need to be performed by veterinary professionals and those that can be performed by others.
6. DAFF, in conjunction with the states and territories, should investigate how contemporary social media could be used to contribute to the communications objectives of an FMD response effort. Current communications plans, which pay little attention to the new media, should then be revisited and updated, along with contingency plans to ensure that skilled communications professionals will be available when required.

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7. The Australian Government and Animal Health Australia should enhance the availability of training for industry liaison officers to maintain a standing reserve capacity.
8. Just-in-time training modules should be completed for each category of tasks that will be required in an FMD response.

State and territory laboratory staff should be trained so they have the capability to undertake testing for FMD. It is recommended that the LEADDR network progress national standardisation and training for FMD diagnostics.

Clear and agreed policy on the respective roles of AAHL and state/territory laboratories during an FMD emergency should be established as a priority.

Each state and territory should ensure advance training and business continuity arrangements are provided to ensure effective support is able to be provided by state laboratories for FMD diagnostics during an emergency response.⁶⁰ The Australian and state governments should also ensure that the state veterinary laboratories are equipped in advance to achieve high specimen throughputs during an emergency animal disease response and for proof of freedom.⁶¹ A report on these laboratory-related initiatives should be brought back to the Primary Industries Ministerial Council within twelve months of acceptance of this recommendation.

9. The Australian Government and state agriculture departments should explore Emergency Management Australia arrangements, with a view to prescribing adequate provisions in existing departmental business continuity plans and emergency management plans, to ensure staff are recognised and supported for the efforts that will be made during a response to FMD.
10. Arrangements should be agreed in advance in peace-time for the rapid prioritisation of agency work and the rapid reassignment of agency people and resources to assist with a response. This agreement should be at the highest level within each state-level agriculture department and within

⁶⁰ L Brown et al. (2011) Responding to the equine influenza outbreak: challenges from a laboratory perspective. Australian Veterinary Journal, Vol 89 Supplement: 32-5.

⁶¹ Animal Health Australia. Report of the National Review of Australia's Response to the 2007 outbreak of equine influenza. Animal Health Australia, Canberra, March 2009, p41

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DAFF—and reflected in agency business continuity and critical incident response plans.

11. The Australian Government should explore the development of volunteer programs to provide much-needed surge capacity in a response.

Alliances should be formed between governments and rural organisations, the private sector, producer groups and local community groups to explore innovative ways in which a volunteer program making use of local resources could be established to provide emergency reserves to contribute to an FMD response.

DAFF, in collaboration with all government jurisdictions and relevant industry groups, should examine the practicality of establishing a national volunteer reserve of people trained to respond immediately to an outbreak of infectious animal disease.

Issue 6: Traceability arrangements in the sheep industry

Livestock traceability is an essential prerequisite for an effective response to an FMD incursion. Once the disease is discovered it is essential that animal movements can be traced both forward and backwards to identify properties that may have been exposed. The speed with which Australia identifies, tracks and assesses dangerous traces will be a key determinant of the size, duration and cost of the outbreak.

Partly for this reason, Australia has developed national livestock traceability performance standards.⁶² However, while the cattle industry is achieving the targets set by the standards and the pig industry has measures in place, recent exercises have demonstrated that the sheep industry falls short of meeting these targets.⁶³ The Review Team found that the sheep industry's current mob-based and largely non-electronic systems are not capable of meeting the nationally agreed standards for livestock traceability. This is particularly concerning given the role sub-clinically infected sheep may play in moving the disease around the country.⁶⁴

DISCUSSION

Traceability refers to the ability to identify the origins of animals (and animal products) through all stages of production, processing and distribution. Tracing—or determining where a diseased animal (or product) has travelled to and from—is essential in controlling disease spread. This is because tracing identifies other potentially infected animals, products and properties for investigation, quarantine or destruction.

The Australian FMD simulation exercise—Exercise Minotaur—in 2002, found that:

*'The development of an identification system that can rapidly and accurately trace animals must be seen in a long term cost benefit perspective. Failure could cost the country billions in the future...This matter must be advanced urgently, particularly by industry.'*⁶⁵

Significant progress has been made in this regard in the cattle and pig industries.

⁶² <http://www.animalhealthaustralia.com.au/programs/biosecurity/national-livestock-identification-system/national-traceability-performance-standards/>

⁶³ http://www.pir.sa.gov.au/data/assets/pdf_file/0008/111050/Agent_newsletter_May_2009_05092.pdf

⁶⁴ GeeringWA, Forman AJ and Nunn MJ (1995). Exotic Diseases of Animals, Australian Government Publishing Service, Canberra.

⁶⁵ http://www.daff.gov.au/_data/assets/pdf_file/0005/146831/minotaurreport.pdf

Of the three major commercially-produced species susceptible to FMD (cattle, sheep and pigs), pigs have the lowest mobility because the intensive nature of production means that pig movements are relatively few. The Australian pig industry currently uses tattooing using carbon based ink to identify pigs for sale or slaughter and the PigPass National Vendor Declaration system for tracking movements.⁶⁶

For cattle, an electronic tagging system allows comprehensive tracking within Australia and provides complete traceability from birth to the abattoir. The system is part of the National Livestock Identification System (NLIS) run by Meat and Livestock Australia with state government legislative support.⁶⁷ Although there is still room for improvement, the Review Team considers these arrangements meet national livestock traceability standards.

While deer, goats, alpacas, buffaloes and camels are also susceptible to and may carry FMD, their numbers (excluding goats) are significantly fewer than commercially produced pigs, cattle and sheep. In addition, there is less commercial and/or intensive farming of deer, goats, alpacas, buffaloes and camels, which further reduces their potential to widely spread FMD. Some of these smaller sectors have also introduced traceability systems.⁶⁸

However, despite many years of discussions, the sheep industry has had great difficulty agreeing and moving forward on a whole of life identification scheme for sheep. As current arrangements stand, the sheep industry falls short of meeting national livestock traceability standards.⁶⁹ The substantial movements of sheep that occur as part of normal production systems, coupled with the fact that sheep can be sub-clinically infected with FMD⁷⁰ means that the lack of traceability in the sheep industry is a significant risk to the effective management of an FMD response in Australia.

During Exercise Minotaur, one of the key issues identified by the international observers was the apparent inability of Australian authorities to identify and trace potentially infected animals. International observers believed the lack of a nationally consistent and compatible livestock identification system would limit Australia's

⁶⁶ <http://www.pigpass.com.au/main.asp>

⁶⁷ <http://www.mla.com.au/Meat-safety-and-traceability/Livestock-identification/NLIS-cattle>

⁶⁸ <http://www.animalhealthaustralia.com.au/wp-content/uploads/2011/05/NLIS-Alpacas-and-Llama-Frequently-Asked-Questions.pdf>

⁶⁹ Animal Health Committee NLIS (Sheep and Goat) Working Group. Report on the assessment of the level of risk associated with current arrangements in meeting traceability requirements for an emergency animal disease or residue incident and proposed mitigating measures.

⁷⁰ Foot and Mouth Disease 2001: Lessons to be Learned Inquiry Report, 2002. Available at: <http://webarchive.nationalarchives.gov.uk>

ability to maintain export market confidence. Such a system is therefore necessary to underwrite the reestablishment of market access for Australian livestock and livestock products.⁷¹

Sheep and traceability

Depending on the production sector and farm location, sheep movements are mostly within a 200km radius from where they were born. For stud animals, this radius of movement might be extended to 500km.⁷² However, distances moved can be much longer than this under some circumstances such as drought, recovery from drought and large regional price differentials. Movement of sheep between property pastures, saleyards, live export centres and abattoirs is part of normal production and this means that sheep have considerable mobility.⁷³

Because sheep movements between flocks are common and because sheep can be sub-clinically infected with FMD—in addition to having low traceability—the risk of FMD spread is greatly increased. When sheep do show clinical signs, FMD detection is less likely as symptoms are easily mistaken for less serious diseases such as footrot.

NLIS (Sheep & Goats) was introduced on 1 January 2006. Unlike the cattle system, it does not use electronic tagging; relying instead on visually readable ear tags printed with a property identification code and is mob-based rather than individual animal-based. Hence, individual sheep are not identifiable through a ‘whole of life identification system’. The system is neither convenient nor accurate and, possibly because of this, uptake of the system is low. Recording of the movement of mobs between properties is also only currently compulsory in two states: New South Wales and South Australia.

In the Review Team’s interviews with stakeholders, interviewees reported that the sheep industry does not support the introduction of an electronic sheep tagging system primarily due to its expense, and a view held by some in the industry that its export markets (particularly for wool) do not face the same risks from FMD as the cattle sector.

However, the Review Team’s assessment is that the sheep industry would almost certainly suffer significant economic impacts due to closure of markets and loss of trade following an FMD outbreak. For the wool sector, while wool is able to be

⁷¹ http://www.daff.gov.au/_data/assets/pdf_file/0005/146831/minotaurreport.pdf

⁷² http://www.daff.gov.au/animal-plant-health/animal/livestock_movement_in_australia_and_emergency_disease_preparedness

⁷³ *ibid*

treated to mitigate the risk of FMD, trading partners may well refuse to accept any animal product until FMD freedom status has been regained. In the past, some countries have banned many things perceived to be a risk from countries affected by FMD: processed food products from animals susceptible to the disease, wheat grain imports, and used machinery and horses which could be contaminated with FMD virus through carrying infected mud or manure. Historically, bans have included chocolate, infant formula, racehorses, used agricultural machinery, wool, semen and embryos, cheese, tinned food and dried food such as ham, pate, dog biscuits, and an array of processed food products containing milk powder.⁷⁴

Furthermore, sheepmeat exports and live export trade of sheep could be directly impacted by an FMD outbreak. In 2009–10, Australia exported 45% of all lamb and 79% of all mutton produced⁷⁵ while the 4.2 million sheep exported live in 2009 represented 12% of the total sheep and lamb turn-off, worth over \$340million to the industry.⁷⁶

In addition the Review Team has heard advice from the Australian retail grocery industry that domestic consumption of all red meat products could be seriously affected during, and for a long period after, an FMD outbreak. The sheep industry would also be impacted, perhaps for long periods, by the standstill arrangements to be implemented early in any FMD outbreak.

CONCLUSION

In the Review Team's view, not enough has changed in the nine years since the need for an effective animal identification and tracing scheme was recognised in Exercise Minotaur. Australia's ability to implement an effective response to an outbreak of FMD would be severely jeopardised by inadequacies in a nationally consistent and compatible livestock identification system that covers all FMD susceptible species.

Traceability is the next most important control (after detection) in containing and controlling an FMD outbreak. An effective whole-of-life traceability system for sheep in Australia is urgently needed to ensure an adequate response is able to be mounted in the event of an FMD outbreak.

RECOMMENDATIONS

The Review Team recommends that:

⁷⁴ <http://www.daff.gov.au/aqis/import/general-info/ian/10/12-2010>

⁷⁵ ABS Agricultural commodities - figures for 30 June 2009

⁷⁶ <http://www.mla.com.au/files/6a4c8c66-ad20-4b74-9aae-9d5a01027ab3/Hassalllive-expor-2006.pdf>

Issue 6: Traceability arrangements in the sheep industry

1. The Australian Government and national sheep industry move to immediately establish a progressive pathway to the adoption of satisfactory traceability arrangements in the sheep industry. Options and recommendations should be put to the Primary Industries Ministerial Council within 12 months.
2. One regulatory option that should be considered is introducing a requirement that abattoirs, saleyards and private buyers may only accept adequately identified sheep.

Issue 7: Policy on FMD vaccination and associated difficulties in preparing for a short-notice vaccination campaign

An important weapon is missing from Australia's arsenal against FMD. Australia lacks a clear and current policy on the use of vaccination as a control strategy for an outbreak of FMD. As things stand, decisions to vaccinate or not would need to be made in the heat of crisis, and probably against the background of vigorous public debate. Delays in making decisions about the use of vaccination could pose a significant threat to the nation's ability to respond rapidly and effectively to an FMD incursion. Both experience overseas and disease modelling studies carried out in Australia show that, in some circumstances, early vaccination is essential to effective disease control.⁷⁷ Importantly, the absence of a clear and agreed national policy on the use of vaccination means that essential planning—including logistical arrangements for the deployment and use of vaccine—cannot be finalised.

DISCUSSION

Policy on the use of vaccination as a control strategy

Australian policy has always been to eradicate the disease as quickly as possible, primarily relying on the use of 'stamping out': the mass slaughter of infected and at-risk animals. The use of vaccination is identified as an option under limited circumstances in AUSVETPLAN; however, global developments in vaccine policy and technology are beginning to overtake Australia's current arrangements, leaving them out of date and in urgent need of modernisation.

At the request of government and industry livestock members, Animal Health Australia began facilitating a review of FMD-related policy in June 2010, with a view to updating Australia's approach to FMD using the current *AUSVETPLAN Disease Strategy Foot-and-Mouth disease manual*⁷⁸ as the basis. While some work has been proceeding on the issue, so long as the fundamental policy issue of vaccination remains unclear, there is an increased risk that this important tool may not be able to be utilised in an effective and timely fashion when needed. In the Review Team's view the timeline for completion of the review process should be accelerated.

International and national discussions on contemporary approaches to FMD control—as well as the experiences of South Korea, Japan and the Netherlands—suggest there may be great benefit in using vaccination as a primary and immediate

⁷⁷ Abdalla A, Beare S, Cao L, Garner G and Heaney A (2005) Foot and mouth disease: Evaluating alternatives for controlling a possible outbreak in Australia. ABARE eReport 06.6, Canberra, April.

⁷⁸ http://www.animalhealthaustralia.com.au/wp-content/uploads/2011/04/FMD3_2-12-FINAL6May10.pdf

control measure in the right circumstances. Contemporary thinking on the use of vaccination is rapidly evolving, due inter alia to:

- experiences in the United Kingdom and Korea, which demonstrated the resource and logistical difficulties with relying on stamping out alone as an eradication strategy for FMD
- the increasing unacceptability within the community of mass animal slaughter (particularly where apparently healthy but at-risk animals are involved)
- the progressive development of diagnostic tests that can distinguish between infected and uninfected vaccinates (a system known as ‘differentiating infected from vaccinated animals’, or DIVA)⁷⁹
- outcomes of recent simulation exercises conducted in Australia (see text box below).

The findings of Exercise DIVA—vaccination in an Australian context

Exercise DIVA '09 was conducted by the Victorian Department of Primary Industries in collaboration with DAFF and other stakeholders. The exercise demonstrated that under the simulated conditions of an FMD outbreak in an intensive dairy production area, infection would spread rapidly and stamping out on its own would quickly exhaust available resources and therefore possibly not achieve eradication. Very quickly, vaccination became a logical alternative. The exercise review also concluded that vaccination was a valid and cost-effective option in areas of high cattle density. The same review found that while the resources and, critically, time required to vaccinate large numbers of animals would be substantial, they would be less than that required for destruction and disposal. (Source: <http://new.dpi.vic.gov.au/agriculture/about-agriculture/publications-resources/animal-health-report>)

Emergency vaccination is likely to be effective only if it is clear when, where and how it would be used. The Review Team considers it essential that these issues are resolved and agreed upon—and associated preparedness arrangements implemented—during ‘peace-time’, if vaccination is to be a feasible and effective option for FMD control in the future. International experience reveals the consequences of not having well-formulated, clear and pre-agreed vaccination policy enabling immediate and decisive action.

⁷⁹ http://www.animalhealthaustralia.com.au/wp-content/uploads/2011/04/FMD3_2-12-FINAL6May10.pdf

For example, Korea's decision to vaccinate pigs, cattle and all other cloven-hoofed animals was delayed until almost six weeks into the outbreak, and was made only when the stamping-out strategy proved inadequate to contain the disease.⁸⁰ By the time the decision was made, however, the outbreak had become a nationwide epidemic; the disease had spread to three provinces with 56 infected farms identified, and over 680 000 livestock destroyed.⁸¹ If the decision to vaccinate had been made and carried out early in the outbreak, however, the disease could have been brought under control much earlier, and led to the reestablishment of affected trade sooner.

Elsewhere experiences have been similar. Earlier use of vaccination in the 2010 FMD outbreak in Japan may have significantly reduced the number of infected properties. However, vaccination was initially prohibited, and it wasn't until authorities faced a shortage of burial sites for animal carcasses—around a month after the initial detection of disease—that vaccination was introduced.⁸²

In the United Kingdom's *Lessons Learnt* review of its 2001 FMD outbreak, there was an acknowledgement of the importance of taking early and decisive vaccination action, and being prepared prior to an outbreak with a clear, agreed policy on the use of vaccination.

Because disease control policy had not been debated widely before the 2001 United Kingdom outbreak, arguments took place publicly as the disease was raging. The issue of vaccination assumed a high profile, not least in the media. However, by the time it was agreed that vaccination should be used to help control the disease in Cumbria, the disease had passed its peak.⁸³

Any decision to use vaccination as part of an eradication response requires consideration of a range of technical and socioeconomic factors. In many situations (for example, small well circumscribed outbreaks and outbreak in a remote location where the disease would not be expected to spread rapidly) vaccination may not be a relevant or effective strategy. However, used in the right situation, in conjunction with other control strategies—such as stamping out of infected premises, movement restrictions and strict biosecurity controls—experience overseas and modelling studies suggest that decisive use of vaccination in the early days of an outbreak could greatly assist with the containment and eradication of the disease.

⁸⁰ <http://www.softlandingkorea.com/blog/2011/02/vaccines-could-have-stopped-korea%E2%80%99s-foot-mouth-disease-crisis/>

⁸¹ *ibid*

⁸² <http://www.animalhealthaustralia.com.au/wp-content/uploads/2011/05/FMD-%E2%80%93-Exercises-and-Recent-Outbreaks-What-have-we-learned-Dr-Graeme-Garner.pdf>

⁸³ Foot and Mouth Disease 2001: Lessons to be Learned Inquiry Report, 2002.

Issue 7: Vaccination policy

A review of experience over the last decade suggests that emergency vaccination can be a highly effective control tool if:

- clear guidelines on the use of vaccination have been developed prior to an outbreak
- the decision to vaccinate is made with speed and certainty in the first days of the outbreak (note that this will be before all desirable information is available to decision-makers)
- vaccination is used in scenarios where the disease would be expected to spread rapidly
- access to sufficient quantities of vaccine can be assured, and vaccine can be deployed efficiently within the first days of the outbreak (which involves effective contingency planning that ensures adequate supply arrangements and sufficient numbers of trained personnel).

FMD introduced relatively recently, occurring on circumscribed properties within a single compartment, lends itself to eradication by stamping out. In contrast, delayed detection, and/or an outbreak in a high density livestock production area where there is already evidence of spread across and between different industry sectors, indicates that control may not be achievable without vaccination.

The importance of trade

Where the Australian context differs from the experiences of other countries such as South Korea, Japan and the United Kingdom is that Australia is a major exporter of livestock and animal products and thus has more at stake in terms of the potential trade impacts of using vaccination. The decision to vaccinate or not will need to consider the potential trade and market access impacts of using vaccination. Historically, the use of vaccination has delayed the reestablishment of market access for affected countries thereby extending the period of loss for affected industries. This is due to the international standards—set by the World Organisation for Animal Health (OIE)—specifying that the time taken to regain FMD freedom status is longer if eradication is achieved using vaccination (see text box below). Vaccination is also an expensive and resource-intensive operation, fraught with complex logistical issues. There is also a biosecurity risk that vaccination teams, if not properly trained and prepared, may inadvertently contribute to the spread of the virus.

Trade implications of FMD vaccination

According to the OIE standards, the waiting periods required to regain the OIE status of FMD free country are:

- where a stamping-out policy is applied: 3 months after the last case*
- where a stamping-out policy and vaccination is applied: 3 months after the slaughter of all vaccinated animals*
- where a stamping-out policy and vaccination is applied but vaccinated animals are not slaughtered: 6 months after the last case or the last vaccination (according to the event that occurs the latest) provided DIVA testing shows the absence of infection in the remaining vaccinated population.*

According to this Code, for Australia to regain its FMD-free status as quickly as possible (in 3 months rather than 6 months), it would be necessary for a stamping-out policy to apply and—if vaccination were to be used—for all vaccinated animals to be destroyed. However, the OIE does not, in practice, determine the length of trade exclusion. In reality, the point in time following eradication of FMD when export trade resumes will be determined by Australia's individual trading partners following their own consideration of the issue. Regardless what eradication strategy is chosen by Australia, exclusion of some commodities from some export markets will most likely last for at least 12 months. However trading partners are likely to rely on OIE standards as a minimum for the reestablishment of trade.

Source: <http://www.animalhealthaustralia.com.au/programs/emergency-animal-disease-preparedness/ausvetplan/fmd-response-policy-review/vaccination-faqs/>

The importance of domestic consumers

Consumer reactions to products from vaccinated animals will also be an important factor for decision-makers when considering the use of vaccination. However, this issue—while noted by key stakeholders—is yet to receive close attention from policy makers. One of the main objectives of an emergency animal disease response is to minimise the potential economic impacts of the outbreak on the affected industries and communities. Central to this goal is ensuring the confidence of domestic consumers is maintained, particularly since they will provide the only viable market for livestock products during the course of the outbreak due to the immediate closure of overseas markets.

In the United Kingdom 2001 FMD outbreak, major supermarkets (in the United Kingdom) indicated they would not stock product from vaccinated animals (despite it being safe for consumption) due to the anticipated backlash from consumers. Additionally, during the simulation exercise Silver Birch held in the United Kingdom in 2010, despite all the previous lessons learned by the United Kingdom regarding the benefits of using vaccination in their circumstances, experts were still unable to agree on whether to vaccinate or not because of the associated consumer issues.

The Review Team considers that the potential impact of consumer issues in Australia needs to be considered by government and industry stakeholders in advance, as these issues have the potential to delay the decision to vaccinate. Industry stakeholders should—as part of business continuity planning—identify strategies for managing consumer confidence and maintaining the viability of domestic markets. Such strategies might include approaches to the major supermarket chains in advance of any outbreak, seeking prior industry-wide agreement that product from FMD vaccinates would be treated in the same way as product from animals vaccinated against other animal diseases of no risk to human health.

The importance of resolving outstanding questions

While the Review Team acknowledges the complexity of determining precise conditions and guidelines for vaccine use, more urgent progress is needed to address the numerous questions surrounding the use of vaccination—which have remained unanswered for too long. While some work to develop guidelines and criteria for vaccine use and decision-making has already been undertaken, many questions remain such as:

- What are the most likely scenarios in Australia where vaccination would be an effective tool?
- How would vaccination be used to optimise its effectiveness in these situations?
- Can Australia's vaccine bank arrangements be improved—including to improve response time—if vaccination is to be available as a short notice option?
- How would we manage deployment of the vaccine and associated issues such as resourcing the campaign, occupational health and safety of vaccination teams, record-keeping, just-in-time training, and animal welfare?
- How should vaccinated animals be managed?
- What are the implications of vaccination for surveillance and subsequent proof of freedom requirements?
- How would associated trade and market access issues be managed?

These questions, amongst others, should be given attention in the AHA-facilitated FMD response policy review. To avoid the policy continuing to remain unresolved, leaving Australia in a vulnerable position and potentially without availability of vaccination as a control option, the Review Team suggests that a date be set in 2012 for finalising and documenting clear policy for vaccination to be endorsed by the Primary Industries Ministerial Council. Specific yet flexible guidelines for the use of vaccine covering the most likely scenarios should be developed as a part of this process. The resulting policy clarity will then allow stakeholders to move quickly to plan for the logistical challenges and practical arrangements that will be necessary to manage during a vaccination campaign. This work too, should be completed to a deadline.

Given the continuing public dispute about the costs and benefits of vaccination, the Review Team suggests that detailed modelling of different scenarios be developed

and released to illustrate the implications for cost, disease spread and the modelled time for restoration of FMD disease free status.

Availability of trained staff for vaccination

The availability of adequately trained staff to perform vaccination is an issue that is currently unaddressed by existing policy and contingency arrangements. Previous outbreaks of emergency animal diseases in Australia have identified a shortage of human resources available to contribute to a response over a sustained period. Failure to adequately plan to resource an FMD vaccination campaign could rule out the use or effectiveness of vaccination as a control strategy.

It is important therefore to determine the resource requirements of a vaccination campaign in Australian conditions, and identify contingency arrangements that provide for a dedicated pool of trained and prepared people to be deployed if the decision should be made to vaccinate.

To do this—following the resolution of vaccination policy—an on-ground simulation exercise should be undertaken to specifically assess the resource requirements of an emergency vaccination campaign across multiple species in each state. The simulation should seek to establish the workforce requirements necessitated by current arrangements (including nationally agreed standard operating procedures and Primary Industry Ministerial Council principles for the use of vaccination) when applied to state livestock populations and a severe-case-scenario outbreak. The simulation exercise could also inform the development of policies and operating procedures that would help to provide a clearer picture of where and how vaccine would be used.

Innovative solutions to establishing and training an emergency workforce to carry out the vaccination campaign should also be considered, including: the use of local community groups and associations; the use of people who may be out of work due to the outbreak; the use of producer groups and livestock-related associations; and engagement with public health institutions, education institutions (such as TAFEs) and student bodies (including medical).

CONCLUSION

The Review Team considers that the option of using vaccination for disease control (including from an early stage in an outbreak) is increasingly important. However, if the option is to be available, outstanding policy issues need to be resolved as a priority. The longstanding absence of a clear, agreed national policy on the use of vaccination increases the risk that this important tool may not be able to be utilised effectively and speedily if needed.

The logistical issues associated with a vaccination campaign will be complex, and more planning work needs to be undertaken in advance of any outbreak to strengthen Australia's capacity to quickly and decisively utilise vaccination as a control measure when judged appropriate.

RECOMMENDATIONS

The Review Team recommends that:

1. Australia prepare as though vaccination will be an essential component of the response to an FMD outbreak in Australia, while recognising that it will be essential in certain scenarios but may not be required in others. Clear national guidelines on when vaccination would be useful in Australian conditions and decision-making criteria covering the most likely scenarios for vaccine use should be developed and documented as soon as possible.
2. The timeframe for the FMD response policy review should be accelerated. In collaboration with industry stakeholders, AHA and DAFF should seek to reach agreement on outstanding policy issues within six months of the acceptance of this report, to be followed by Primary Industries Ministerial Council endorsement of the updated policy in 2012. The Australian Government, in collaboration with Animal Health Australia, should exercise leadership in driving the resolution of these outstanding issues.
3. To assist with the development of contingency plans that adequately address the human resource requirements of a vaccination campaign, an on-ground simulation exercise should be undertaken to specifically assess the resource requirements of an emergency vaccination campaign across multiple species in each state. The simulation should seek to establish the workforce requirements necessitated by current arrangements (including nationally agreed standard operating procedures and Primary Industries Ministerial Council principles for the use of vaccination) when applied to state livestock populations and a severe-case scenario outbreak. The simulation exercise could also inform the development of policies and operating procedures that would help provide a clearer picture of where and how vaccine would be used.
4. Based on the outcomes of the simulation exercise, DAFF and the states should revisit contingency plans to ensure that trained personnel of sufficient number are available in an outbreak to deliver an emergency FMD vaccination program—from the initial deployment phase through to the proof of freedom phase. Contingency plans should adequately address the issues of just-in-time training, decontamination of vaccination teams, and the management of occupational health and safety issues.
5. Innovative solutions to establishing and training an emergency workforce to carry out the vaccination campaign be considered, including but not limited to:
 - engagement with local communities and associations
 - engagement with producer groups and livestock-related associations
 - engagement with public health institutions, education institutions (such as TAFEs) and student bodies (including medical)
 - both advanced and just-in-time training arrangements.

Issue 7: Vaccination policy

6. Industry stakeholders—as part of business continuity planning—identify strategies for managing consumer confidence and maintaining the viability of domestic markets.

Issue 8: Preparation for the known challenges of carcass disposal

There is a real possibility that an FMD incursion could have spread widely before it is detected and/or that the initial outbreak will affect an intensive livestock raising area. In this situation an emergency response to an FMD outbreak will require the humane slaughter and disposal of large numbers of animals. However the Review Team found that, despite warnings, plans and preparations at the necessary scale are not in place for this eventuality. In particular, Australia is likely to immediately face logistical challenges associated with the slaughter and disposal of animal carcasses. Current deficiencies in plans and preparations for carcass disposal will slow disease control efforts and pose an additional challenge for decision makers in the midst of a crisis. The Review Team also observes that public attitudes to animal slaughter may be changing. Long-standing plans for aggressive ‘stamping out’ may incorrectly assume public acceptance of large-scale slaughter of diseased and /or apparently healthy but at-risk animals.

DISCUSSION

‘Stamping out’ is a disease control policy that has been adopted by most countries, including Australia, since the beginning of the 1900s. Slaughtering (culling) all infected animals—as well as healthy animals from adjoining and at-risk farms—has been seen as the most effective way of gaining control of the disease and, most importantly, regaining the economically vital FMD-free status that is required for trade into high value FMD-free markets.

However, international experience—and Australian simulations—are beginning to reconsider the effectiveness of stamping out alone as the primary control measure. Its use in conjunction with strategic, complementary and contemporary approaches (including vaccination—see above) is now advocated.⁸⁴

Community attitudes to stamping out are also an increasingly important consideration as societal values change and consumers’ demands increase for different standards of ethical practice from the animal food production industries. There is also the issue that slaughtering of animals wastes large amounts of protein at a time when over one billion people lack sufficient food, yet there is no known risk to human health from eating previously FMD-infected or vaccinated animals.

These issues will require careful consideration by the Australian Government, as mass slaughter campaigns are increasingly unlikely to be wholly accepted or understood by the Australian public as the best means for disease control.

⁸⁴ http://news.bbc.co.uk/2/hi/uk_news/1333255.stm

Nonetheless, slaughter and disposal of infected or at-risk animals (potentially including vaccinated animals) will remain a necessary strategic option in Australian disease control. Thus, it is both prudent and necessary for Australia to prepare for the possibility of urgent culling and disposal of large numbers of livestock, possibly in the millions.

Burning funeral pyres and huge burial pits remain synonymous with the United Kingdom FMD outbreak in 2001. Faced with the need to dispose of the carcasses of millions of slaughtered animals, authorities found themselves quickly overwhelmed, and faced with unprecedented disposal challenges. The British Government had known prior to 2001 of the inadequacy of provisions for disposal as these were noted in the Drummond Report in 1999, and acknowledged by the State Veterinary Service in July 2000. Following the 2001 outbreak and the enormous public and media outcry generated by mass pyres and other means of carcass disposal, inadequate arrangements for disposal was a key finding of the *Lessons to be Learned Inquiry Report*.

In the United Kingdom, burning thousands of carcasses and burying thousands more also had negative environmental impacts. Burning polluted the air through raising dioxin levels, and the use of toxic accelerants (such as tyres) in cremation pyres caused further problems. Ground water was polluted by harmful disinfectants and other toxins leaking from buried carcasses. Hastily established mass burial sites also generated local anti-government antipathy, in addition to ongoing management costs. In short, disposal solutions devised in the midst of the crisis led to new problems.⁸⁵

A similar lesson was learnt during the 2010 outbreak of FMD in Japan. The outbreak caused the largest animal cull in Japanese history and the country ran out of burial sites, scrambling to identify new sites during the crisis. Burials that did occur were also hampered by persistent rain which considerably slowed burial progress. Thus, failure to plan and prepare disposal arrangements adequate for a large-scale outbreak reliant on slaughtering-out compromised the country's disease control efforts. It also resulted, again, in sub-optimal disease control policy being formulated mid-crisis.

The Drummond Report commented that

⁸⁵ Foot and Mouth Disease 2001: Lessons to be Learned Inquiry Report, 2002

*‘...there is little time to debate the merits of one disposal method against another when disease has broken out and carcasses on the infected premises are starting to decompose’.*⁸⁶

Supporting this are findings of the 2009 Victorian FMD simulation exercise, DIVA, which simulated an outbreak of FMD in a densely-populated dairy farming area. The numbers of positive cases rose rapidly each day, quickly leading to a backlog of sick, infected and possibly-infected animals which—in a real outbreak—would all need to be slaughtered. The exercise demonstrated that, under those conditions, the current FMD response policy was inadequate to address the actual disposal needs of large-scale stamping out.

Specifically, the exercise uncovered deficiencies in the current response policy to provide:

- sufficient numbers of trained personnel to kill animals;
- access to disposal options such as burial or incineration;
- guidance on transport of carcasses to disposal sites; and
- identification and access to suitable disposal sites.

Interviews conducted by the Review Team with animal health stakeholders around the country also highlighted that disposal is likely to be a major issue in Australia if slaughtering out is used as a control strategy.

The decisions that must be made about disposal will not be easy. Australia’s AUSVETPLAN manual on disposal procedures provides that disposal methods must:

*‘... prevent the dissemination of infection, gain international acceptance, be acceptable to the local and broader community, meet legislative requirements and industry standards, take into account community and operator safety, take into account the local environment and geology, be consistent with resource availability, consider animal welfare, comply with local legislation relating to the classification and disposal of waste materials, consider cost effectiveness and speed, not adversely affect the environment or the community, consider future land-use requirements, include plans for long-term public risk safeguards, and ensure acceptable and biosecure arrangements for transportation are available...’*⁸⁷

The same manual provides a decision-making matrix for ranking the utility of various disposal methods for a specific response. The process involves determining the type

⁸⁶ ibid

⁸⁷ http://www.animalhealthaustralia.com.au/wp-content/uploads/2011/04/DISP-3_0-22FINAL18Jul07.pdf

and quantity of waste to be generated, identifying how the waste will be treated to reduce its waste-stream classification to the lowest level, and assessing and quantifying the relative importance of factors (such as operator safety, community concern, legislative requirements, industry standards) for each option. A risk assessment must also be made of all transport and disposal activities to be carried out. After this is done, the local disease control centre compiles all this information and its recommendations into a report which is then submitted to the state disease control headquarters for decision.

The Review Team considers that undertaking such a complex decision-making process during an outbreak is both undesirable and impracticable, and could position Australia to repeat the unfortunate disposal experiences of the United Kingdom and Japan. Inadequate planning for disposal will undermine Australia's capacity to effectively manage a response involving the use of stamping out.

Consistent with the Review Team's new policy principle number (2)—that Australia's FMD planning should focus more on the preparedness end of the emergency management continuum—the Review Team considers that preparedness should be improved by working now to ensure that all viable disposal options and related information are in place and readily available for decision-makers at the outset of any FMD emergency.

The issue of disposal was highlighted as a concern in Australia as long ago as 2006 when the Animal Health Committee instigated a process for all jurisdictions to engage and determine policy and implementation arrangements for identification of disposal sites. However, five years later much work remains to be done. Progress may require additional national leadership by DAFF to urgently address whether all jurisdictions' disposal arrangements meet requirements set out in the National Animal Health Performance Standards.

CONCLUSION

Large scale slaughter and disposal can pose significant logistical problems. Community attitudes to large scale slaughter may be changing faster than FMD response planners have recognised to date. Nevertheless, the Review Team considers it important that viable slaughter and disposal options are available to decision-makers immediately in the event of an FMD outbreak. Vaccination and other response measures will be insufficient by themselves.

Australia's preparedness to respond effectively to an outbreak of FMD is undermined by the absence of thorough forward planning to address well-known challenges relating to disposal. A dedicated body of work needs to be undertaken—in peace-time—to ensure viable disposal options and related information are immediately available to decision-makers in an emergency response.

RECOMMENDATIONS

The Review Team recommends that:

1. Assessments should be undertaken (as soon as possible) in each state and territory to determine the disposal requirements of a severe-case-scenario

outbreak using stamping out as the primary control measure. The assessment should:

- establish a reliable picture of the populations of major FMD-vulnerable species (cattle, pigs and sheep) and the distribution of these production industries within each state and territory
 - map current commercial slaughter facilities (including rendering plants) and collect information relating to their capacities—including throughput capacity, trained personnel, and the length of time maximum operational capacity can be sustained
 - develop a map of sites currently suitable for mass burial of animal carcasses, taking into account environmental factors, such as water tables, and other regulatory requirements
 - based on the information collected above, assess the jurisdiction's current capacity to dispose of all carcasses within the most densely populated areas of livestock production.
2. Contingency plans should be updated (following the above assessment) to address any shortfalls in jurisdictional disposal capacity. Plans will need to be tailored to address the unique geography, infrastructure and livestock industry demographics in each state and territory.
 3. Each suite of disposal options developed for each jurisdiction should be articulated as an appendix to the AUSVETPLAN manual on disposal. In addition, the AUSVETPLAN disposal policy should be updated in accordance with the outcomes of the work program provided above.
 4. A risk assessment (consistent with state or territory legislation) of transport and disposal activities required by specific options should be performed and documented prior to an outbreak. Any issues identified by risk assessments should be remedied to ensure immediate implementation of the state's disposal plan will be possible.
 5. Novel and innovative methods of disposal should be explored which suit Australian conditions and requirements. Concurrently, a program should be designed to progress policy allowing the safe consumption of meat and products from animals slaughtered for disease control purposes (including infected, vaccinated and at-risk animals).
 6. Plans for carcass disposal should be publicly released to gauge public reaction. At the same time an investigation of contemporary public attitudes to animal slaughter and disposal should be commissioned to inform decision makers of likely public reactions well in advance of any outbreak.

Issue 9: The possibility that FMD may not be detected readily and speedily

Despite a positive track record of recognising exotic and emerging diseases in recent years (such as Newcastle disease and avian influenza in poultry, and Hendra virus and equine influenza in horses) the Review Team found that in Australia, there is still a strong possibility that an incursion of FMD may not be readily detected. This is due to a range of factors including: the often subtle clinical signs displayed by infected animals—or the absence of clinical signs in species such as sheep; the similarity of symptoms between FMD and other less serious but more common diseases such as footrot; and varying degrees of FMD-awareness amongst producers, coupled with an apparent reluctance to contact veterinarians to tend to livestock.

FMD can spread rapidly if detection is delayed. Any delay in detecting FMD could seriously amplify the scale and duration of the outbreak, the losses that are experienced, and the nation's ability to recover. Early detection is crucial in limiting the spread of an outbreak and enabling a swift and effective response to contain and eradicate the disease. Overseas experiences, and modelling in Australia, indicate that even a few days delay in detecting an outbreak can make a big difference to the scale and duration of the incursion.

DISCUSSION

Early detection is a critical determinant of a country's ability to contain and eradicate FMD. Early detection of FMD: minimises spread, maximises the likelihood of control and early recovery, reduces the duration of response activities and minimises losses, costs and impacts. In the United Kingdom in 2001, the magnitude of the FMD outbreak was primarily due to the delay in detection with the first case of the disease not being recognised and reported for three weeks. By the time veterinarians investigated suspected FMD, the virus was already incubating in more than 50 locations. So before anyone realised its existence, FMD had been seeded in many areas around the country. At least 57 farms in 16 counties were infected by the time the first case was confirmed.⁸⁸

Thus, for a response policy of stamping out to be effective, early detection is important. Animal movements must be stopped immediately and the source of the disease quarantined and affected animals disposed of as quickly as possible.

⁸⁸ Foot and Mouth Disease 2001: Lessons to be Learned Inquiry Report, 2002

Factors contributing to the uncertainty that an incursion would be readily identified in Australia include:

- **Clinical signs of FMD are not always obvious**

Clinical signs of FMD are not always observable, or typical: sheep often show no clinical signs, and symptoms can vary from large visible vesicles to milder signs of inflammation hidden from obvious view. Different strains of FMD produce different clinical signs. Japan's 2010 incursion of FMD went unnoticed for approximately a month, primarily because non-classical symptoms were present. Thus, veterinarians initially diagnosed diseases other than FMD and by the time the correct diagnosis was made, over ten farms were already infected.⁸⁹ In Australia, failure of owners to recognise a problem in their livestock may be exacerbated by lower levels of animal inspection in more extensive production systems.

- **Presence of less serious diseases**

In Australia FMD may be overlooked as a possible diagnosis because of the presence of less serious endemic diseases such as footrot and three-day sickness (bovine ephemeral fever) which cause symptoms similar to FMD. These diseases can create complacency among producers and animal handlers towards symptoms which are also caused by FMD.

- **Limited experience with FMD**

Relatively few veterinarians in Australia have had first-hand experience dealing with animals infected with FMD, making it challenging for many to readily identify the disease clinically and determine how long the disease had been present in an infected animal by aging the lesions.

- **Reluctance to contact veterinarians / lack of trust in authorities**

In some areas, there is a degree of reluctance amongst producers to contact a veterinarian to diagnose illness in flocks or herds. A number of experts consulted by the Review Team agreed that many farmers will lose sometimes substantial numbers of stock before contacting a vet. Recent research confirms this, with Western Australian sheep and cattle producers reporting that they considered it unnecessary to consult a vet for the illness or death of just one animal. The study found that farmers were more likely to evaluate

⁸⁹ Nishiura & Omori. An Epidemiological Analysis of the Foot-and-Mouth Disease Epidemic in Miyazaki, Japan, 2010. *Transboundary and Emerging Diseases*. 57, 2010. Blackwell Verlag GmbH:396–403.

animal health risks themselves than to rely on experts (in whom they have limited trust), and to diagnose and treat sick livestock themselves.⁹⁰

The researchers also reported that some farmers did not trust the government to take responsibility in a disease outbreak, and considered disease measures at the national level inadequate or incompetently performed. This belief, and lack of trust, motivated them to avoid what they saw as allegedly ineffective official protocols or farm biosecurity practices—including disease reporting.

Both research and experience show that it is not enough to simply declare that FMD is a notifiable disease and expect reporting compliance. Both ability and motivation also play a role. In the United Kingdom FMD was a notifiable disease in 2001, but evidence suggests that the disease was present there for several weeks without being reported despite the requirement for farmers to report suspected cases.⁹¹

Recognising the importance of early detection, Australian authorities and livestock industries have made a significant investment over many years in campaigns aimed at raising awareness of FMD. Whilst these initiatives are to be commended, there remains a need for a sustained national effort to target awareness and increase the likelihood of early detection.

With FMD a notifiable disease, and reporting compliance assumed, the United Kingdom's response policies and contingency plans were predicated on early detection of a relatively small, contained outbreak, for which tracing and culling of infected livestock would be a straightforward. Thus the policies in place in 2001 had neither the foresight nor the flexibility to manage the situation that actually emerged whereby the disease remained undetected for three weeks and had spread extensively throughout the country.⁹²

The implication for Australia is that, to the extent current plans are based on an implicit assumption of early detection and therefore a small scale outbreak, Australia could be under-prepared for the real event. The Review Team considers it prudent that Australia revisit FMD contingency and response plans to ensure they adequately anticipate and address scenarios likely to arise in case of delayed detection.

⁹⁰ Palmer, Fozdar & Sully. The effect of trust on West Australian farmers' responses to infectious livestock diseases. *Sociologia Ruralis*. Vol 49, No. 4, October 2009. Blackwell Publishing, Oxford:360-374.

⁹¹ Foot and Mouth Disease 2001: Lessons to be Learned Inquiry Report, 2002.

⁹² *ibid*

Despite significant efforts by all stakeholders to raise awareness of FMD, Australia needs to further improve its chances of early detection through innovative training, awareness and surveillance programs coordinated at the national level, which are aimed at producers and others already observing animals on a daily basis.

A program aimed at addressing the risk of delayed detection should include the following key elements:

Traditional surveillance: Focus on surveillance for those diseases that display similar signs to FMD, and a focus on areas of densely populated livestock where failure to detect the presence of the disease would carry greater consequences. This should include an enhanced exclusion testing regime.

Innovative surveillance and training programs: The National Significant Disease Investigation (NSDI) Program, managed by Animal Health Australia, aims to boost Australia's capacity for the early detection of emerging and emergency animal diseases by recruiting greater participation of veterinary practitioners in disease investigations.⁹³ This program supports private veterinary practitioners to investigate and report on potentially significant disease incidents in livestock and wildlife. Programs such as this provide an important connection between private practitioners and authorities—a critical link for the detection and reporting of emergency animal disease.

However, a connection also needs to be established with producers and their communities, recognising that veterinary practitioners may not always be the first people to observe potentially infected animals.

Training programs should target people already observing animals regularly as a part of their daily work activity, such as animal health professionals and para-professionals, drovers, transporters, owners, producers and workers involved in daily animal production management activities. Innovative awareness and communication programs—which build trust as well as delivering information—should target agricultural communities and utilise existing producer networks. The program should also focus on higher-risk areas (for example, areas of densely populated livestock where failure to detect the presence of the disease would carry greater consequences) and consider the use of new technologies to help raise awareness and facilitate reporting.

Committed and ongoing training of government vets and rural veterinary practitioners: Building a core of veterinary professionals capable of recognising and

⁹³ <http://www.animalhealthaustralia.com.au/programs/disease-surveillance/national-significant-disease-investigation-program/>

diagnosing FMD, and determining the age of lesions, to assist with epidemiological investigations is important. Building such a core will require ongoing training for government veterinarians, preferably with opportunities to gain first-hand experience with FMD in countries where cases are found. Providing assistance to veterinary practitioners through sharing Australian Government expertise—including through specifically designed training courses—should be made a priority, and the ongoing need for this experience and training to be provided should be reflected in national and state government work plans.

Animal Health Australia manages the National Emergency Animal Disease Training Program, which provides education and training for personnel in the Australian livestock industries to contribute to an emergency animal disease response.⁹⁴ The program encourages an awareness of emergency animal disease response measures amongst government officers, livestock producers, private veterinary practitioners and emergency workers. This program provides a sound foundation that could be expanded upon to include training specifically aimed at recognising FMD.

CONCLUSION

The Review Team has concluded that despite significant efforts over the years by stakeholders to raise awareness of FMD, there is a strong possibility that there could be delayed recognition of an incursion of FMD in Australia, which could increase the scale and duration of any outbreak. There would be value therefore in a sustained national effort to implement nationally-coordinated, innovative awareness programs, utilising the latest technologies and targeting areas of highest risk, to improve the country's chances of early detection and rapid response.

The Review Team is concerned that FMD planning in Australia has—at least in part—been based on an implicit assumption of early detection and therefore a small scale outbreak. To the extent this is so, Australia could be under-prepared for the real event. The Review Team considers it prudent for contingency plans to be revisited based on the pessimistic assumption that the disease could have been present for some time or be well established by the time it is detected. Estimates of the resources required to mount an immediate response should be adjusted and planned for accordingly.

⁹⁴ <http://www.animalhealthaustralia.com.au/training-centre/emergency-animal-disease-training-program/>

RECOMMENDATIONS

The Review Team recommends that:

1. A dedicated, continuing national program led by DAFF and delivered in conjunction with the states and territories and relevant livestock industries should be implemented to improve the likelihood of early detection. The program should focus on higher-risk areas (such as areas of densely populated livestock where failure to detect the presence of the disease would carry greater consequences) and should include elements involving traditional surveillance, innovative community-based programs and ongoing training for veterinarians. The program should also consider the use of new technologies to raise awareness and facilitate reporting.
2. Innovative training programs be explored that target groups observing animals on a regular basis (for example, those involved in daily animal production management activities). The use of community-based organisations and other sources of services already utilised and trusted by producers should also be explored.
3. Jurisdictions and industry should revisit contingency and emergency response plans to review assumptions made regarding the likelihood of early diagnosis and reporting of an FMD incursion, and make adjustments as necessary to ensure Australia is well placed to deal with a situation where detection could be delayed. These review processes should include the FMD response policy review currently underway under the leadership of Animal Health Australia.

Issue 10: A lack of clarity about responsibility and accountability for national FMD planning processes

Australia's current planning processes for FMD have developed against a background of consensus decision-making arrangements involving Australian and state/territory governments and affected industry bodies. However, such commendable consultative arrangements have tended to obscure authority, responsibility and accountability for progress in national FMD planning and preparations and has increased the potential for delays, confusion and compromise. Legal and political authority for decisions is not always clear and accountability for making progress (for example to finalise draft plans and to tackle topics in dispute) is often 'collectivised'. As a result, so no single body or individual is sufficiently clearly responsible.

DISCUSSION

The Review Team has identified two areas of the FMD management continuum potentially affected by the shortcomings of consensus decision-making:

1. Decision-making in an FMD response
2. Decision-making about FMD plans and preparedness.

1. Response decision-making

The Australian Emergency Animal Disease Response Agreement (the EADRA) is a world-first agreement that inter alia sets out how government and industry stakeholders will work together and share the costs of responding to an outbreak of emergency animal disease. The EADRA prescribes a participatory approach to decision-making through committee mechanisms (namely the CCEAD and NMG) so that all relevant stakeholders are appropriately represented and a party to response decisions that could affect their interests.

The principles espoused by EADRA represent the fundamental pillars of Australia's enviable collaborative preparedness and response arrangements. However, the Review Team considered that for all of the strengths of the EADRA, a critical area of weakness remains.

Exercise Minotaur, conducted in 2002, found that while both CCEAD and NMG were able to reach consensus on all aspects of decision-making throughout the simulation, concern was expressed that in a real emergency there remains a possibility that a

single party to the deed could have the power of veto and potentially delay response activity. The report of the exercise commented that while consensus decision-making was desirable in principle, emergency decisions must be made swiftly and surely, and so included a recommendation to ‘...*reconsider the wisdom of consensus decision-making during emergencies*’.⁹⁵

The Review Team sees great value in the longstanding consensus-based approach in Australia but endorses the post-Minotaur recommendation. A response to an incursion of FMD will require rapid and authoritative decision-making that facilitates immediate action. A ‘reserve power’ to break a deadlock in decision-making in an emergency would be a desirable improvement to current national arrangements. Consistent with new policy direction (1)—that the Australian Government should have a clear leadership role—the Review Team considers this power should reside with the Australian Government.

2. Decision-making about policy and preparedness planning

The Review Team’s main concern about Australia’s admirably consultative ethos is that FMD planning has been slow and changes to plans, once agreed, have been particularly slow.

The development of plans now tends to be via committee processes almost by default. This has costs in terms of speed of decision-making and possible compromise to lowest common denominator outcomes—or sometimes no outcomes at all. For example as noted earlier in this report there are a number of major issues such as the role of vaccination in AUSVETPLAN and the adequacy of traceability arrangements in the sheep industry that have been unable to be resolved for many years. It is noteworthy that AUSVETPLAN for FMD has been an incomplete draft now for some years.

Such planning and collective decision-making clouds responsibility and accountability. In the Review Team’s view, ‘when everyone is responsible, no-one is responsible’. Significantly, when the Review Team questioned stakeholders during our consultations about who had the lead responsibility for FMD preparedness and planning in Australia, there was a wide range of different answers.

The Review Team also notes that although legal accountability may currently be obscure, it would eventually be found to reside with someone if litigation or a commission of inquiry were to be initiated. It is therefore in all parties’ interests to know in advance where responsibility and accountability lie.

⁹⁵ Exercise Minotaur Evaluation Report, Commonwealth Government of Australia, 2005

The Review Team has sought to find a way to preserve the best features of the current system (good consultation and proper stakeholder engagement) while adapting the system to be clearer about ultimate responsibility and accountability. The Review Team suggests that ambiguity about the national leadership role in FMD should be resolved by assigning the Australian Government through DAFF ultimate leadership responsibility and accountability to the Primary Industries Ministerial Council. This should include a timeline for driving the finalisation by Animal Health Australia of the FMD policy review, and in particular for the finalisation of the draft AUSVETPLAN for FMD. Thereafter it should be DAFF which has responsibility for initiating action to maintain and update plans. Of course, DAFF should exercise this responsibility in a consultative way, but not at the expense of quality and reasonable timeliness.

CONCLUSION

The Review Team has concluded that authority and responsibility for emergency animal disease management has been obscured and needs to be clarified. Lead responsibility should be assigned more clearly to the Australian Government through DAFF.

Decision-making processes surrounding animal disease planning and management need to be reviewed to maximise clarity of responsibility while seeking to preserve the best features of the current system—good consultation and stakeholder engagement.

RECOMMENDATIONS

The Review Team recommends that:

1. The post-Minotaur recommendation to '*...reconsider the wisdom of consensus decision-making during emergencies*' be implemented, including examination of a reserve power for the Australian Government to break deadlocks in an emergency. If this recommendation is accepted, DAFF should bring forward implementation recommendations within six months.
2. Ambiguity about the national leadership role in FMD should be resolved by assigning the Australian Government through DAFF ultimate leadership responsibility and accountability to the Primary Industries Ministerial Council. This should include a timeline for driving the finalisation by Animal Health Australia of the FMD policy review, and in particular for the finalisation of the draft AUSVETPLAN manual for FMD.

Issue 11: Planning for community recovery

Emergency animal disease events of the scale of an FMD outbreak can adversely impact communities in a number of ways. Negative impacts can be due either to the disease itself or control and response efforts. In the absence of pre-planning, governments may well be forced to implement community compensation and recovery arrangements on an ad hoc, and possibly inconsistent, basis. Affected individuals and communities will have diverse needs, wants and expectations, which are both immediate and evolve rapidly. In the Review Team's view, arrangements need to be put in place now to set predictable and consistent parameters for community recovery programs to ensure that individuals, families, businesses and communities affected by an FMD outbreak have access to services and assistance that enable rapid national recovery.

DISCUSSION

A 'disaster', generally, is any shock to social and economic systems whereby the need for resources outstrips their supply temporarily. Disasters may or may not involve loss of human and/or animal life.⁹⁶

Outbreak disaster recovery strategies are aimed at the restoration of emotional, social, economic and physical wellbeing of those affected. Strategies include: financial assistance; psychological and social counselling; business advice; and economic, environmental and social community rebuilding measures.⁹⁷ Recovery can also provide an opportunity to improve former community wellbeing by enhancing social and natural environments, infrastructure and economies. This improvement can then contribute to a more resilient community.⁹⁸

An FMD outbreak has the potential to have greater social and economic impact than many natural or infrastructure disruption disasters that regularly occur in Australia. While natural disasters such as flood, fire or drought are often localized, in an FMD outbreak, overseas markets for Australian livestock and livestock products would immediately be closed, causing the emergency to quickly become a national problem. Even uninfected states and territories would be severely affected, since implementation and acceptance of zoning measures takes time. (If measures are taken within an FMD affected country to establish a zone as disease-free—in

⁹⁶ Emergency Management Australia, 1996. Australian Emergency Manual—Disaster Recovery, Canberra

⁹⁷ *ibid*

⁹⁸ http://www.dhcs.act.gov.au/data/assets/pdf_file/0013/212314/The_National_Principles_for_Disaster_Recovery_designer.pdf

accordance with OIE guidelines—trade may resume with that zone after a specified period.)

In addition to the national scope of its impact, the effects of an FMD outbreak are likely to be more prolonged than that of other disasters. Thus, overseas experience has shown that eradication is likely to be a protracted process, possibly lasting months. This is in contrast to disasters caused by infrastructure disruption and extreme weather events which may only last days or weeks. Even if eradication proves swift, it usually takes months to regain international market access and even longer to re-establish market share, so export-oriented industries are heavily affected.

The equine influenza outbreak in Australia in 2007—and overseas experience with FMD outbreaks—also reveal how the impact of disease outbreaks and response measures was felt well beyond rural and regional areas. Numerous non-agricultural industries were also affected, including tourism, transport and sport.⁹⁹

Furthermore, emergency animal disease outbreaks (and response measures) have a social impact. Social impact includes feelings of uncertainty, stress, anger, a sense of loss of personal control over life, and despair; all of which influence behaviour and determine the health and recovery of communities.¹⁰⁰

In the United Kingdom, the social impact of FMD on individuals, families and communities, as well as those working in control programs and support services, has been identified by numerous studies as significant and enduring.¹⁰¹ Research also reports that the social impact of the equine influenza outbreak in Australia was high for horse owners and industry participants.¹⁰² This was despite the comparatively mild symptoms and control measures for equine influenza.

All of the above factors suggest the desirability of requiring all jurisdictions to have in place comprehensive FMD and emergency animal disease recovery strategies for communities and industries. To ensure consistency and effectiveness, these should be based on the Australian Government National Principles for Disaster Recovery discussed in more detail below.

⁹⁹ E Barclay (2005) Local community preparedness for an Emergency Animal Disease outbreak. RIRDC, Canberra. <https://rirdc.infoservices.com.au/downloads/05-131>

¹⁰⁰ *ibid*

¹⁰¹ *ibid*

¹⁰² http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0019/262306/psychological-distress-associated-with-equine-influenza.pdf

While the Australian Emergency Manuals¹⁰³ series provide recommendations for the management and delivery of support services (including recovery) in a disaster context, these are geared towards natural disasters, and none deal specifically with animal disease emergencies. It is important, however, that recovery strategies be tailored for animal disease emergencies. Research shows that while most people have had experience with infrastructure disruption or natural disasters, few have had experience with emergency animal diseases.¹⁰⁴ This makes an emergency animal disease an unknown quantity—especially when the disease cannot be ‘seen’—and increases uncertainty and stress. The nature of animal disease control measures—movement restrictions and slaughtering out—are also less well understood and accepted than most emergency response measures. It should also be noted that the AUSVETPLAN manuals, while comprehensive in their description of control measures and other areas, does not address forward recovery planning in any detail.¹⁰⁵ Thus, Australia’s current level of forward planning for recovery does not match its high standard of preparedness planning for control measures.

Sudden impact emergencies (for example, fires, floods, riots, explosions, major accidents) are usually managed by local or state emergency services, voluntary organizations and authorities who are also strongly involved in recovery decision-making. In contrast, most decisions about response measures for emergency animal diseases are made at the national level, as export trade is a national interest. However, national involvement in recovery decisions is limited, and absent at a community level. Thus, emergency animal disease recovery plans and guidelines should be made at the local level. The Review Team is aware of DAFF’s *Guidelines for Local Government for Agricultural Emergencies* and considers the resource a step in the right direction.¹⁰⁶ However, the guidelines are not readily available, do not focus on recovery, and information on local government awareness or uptake of the guidelines is unavailable.

Under the existing inter-governmental MOU on national response to an FMD outbreak, the main national decision-making groups for recovery are the High Level FMD Management and Recovery Group and the Commonwealth-State Policy Taskforce. These two groups are responsible for reporting, recommending and

¹⁰³ <http://www.ema.gov.au/www/emaweb/emaweb.nsf/Page/Publications>

¹⁰⁴ E Cole & P Buckle (2004) Developing community resilience as a foundation for effective disaster recovery. *The Australian Journal of Emergency Management*, Vol. 19 No. 4, November:6-15.

¹⁰⁵ <http://www.animalhealthaustralia.com.au/programs/emergency-animal-disease-preparedness/ausvetplan/>

¹⁰⁶ Australian Government Department of Agriculture, Fisheries and Forestry (2004). *Guidelines for Local Government for Agricultural Emergencies*.

overseeing social, community and business recovery programs and policies for FMD. A communications plan, the National Agriculture Emergency Communication Model¹⁰⁷ has been published and a primary industries National Communications Network¹⁰⁸ established. However, while these have been positive steps in implementing effective communication strategies, more national forward planning is required for other recovery elements.

The FMD outbreak in the United Kingdom demonstrated the need for closer linkages between disease control and recovery arms of government in order to better manage the impacts of an FMD outbreak and control measures. Supporting this, during Exercise Minotaur¹⁰⁹, all jurisdictions reported that the integration of emergency services, relief and recovery agencies, disease control and other interested agencies under a whole-of-government response arrangement was fundamental to the success (including recovery) of their response. While there is formal linkage between recovery and disease control agencies through the MOU mentioned above, action arising from the linkage is currently limited to agreement about planning during or following an outbreak. Similarly, the plan to coordinate Australian Government agencies in the event of agricultural incidents—the *Australian Government Agricultural Emergency Plan*—focuses on recovery roles and activities during or after an incident.¹¹⁰ What is needed, however, is forward joint planning by recovery and disease control agencies about how the delivery of control and recovery services can be better linked. This is especially important for managing the impacts of an FMD outbreak since control measures themselves (such as quarantine and culling) may have as much social, economic and physical impacts as cases of disease.¹¹¹

Prior planning for linking delivery of control and recovery services is required now, as recovery plans and arrangements require peacetime testing of their effectiveness and rehearsal. Rehearsal is important since the effectiveness of recovery plans and arrangements (and maintaining public confidence) are largely dependent on speed of delivery.

¹⁰⁷ http://www.daff.gov.au/_data/assets/pdf_file/0011/555824/emergency-comms-model.pdf

¹⁰⁸ <http://www.daff.gov.au/animal-plant-health/emergency/comms>

¹⁰⁹ <http://www.daff.gov.au/animal-plant-health/emergency/exercises/minotaur>

¹¹⁰ Australian Government Department of Agriculture, Fisheries and Forestry (2004). Australian Government Agricultural Emergency Plan.

¹¹¹ E Barclay (2005) Local community preparedness for an Emergency Animal Disease outbreak. RIRDC, Canberra. <https://rirdc.infoservices.com.au/downloads/05-131>

The Australian Government *National Principles for Disaster Recovery*¹¹² document identifies six elements for successful recovery:

1. **Understanding the context:** Successful recovery is based on an understanding of the community context.
2. **Recognising complexity:** Successful recovery acknowledges the complex and dynamic nature of emergencies and communities.
3. **Using community-led approaches:** Successful recovery is responsive and flexible, engaging communities and empowering them to move forward.
4. **Ensuring coordination of all activities:** Successful recovery requires a planned, coordinated and adaptive approach based on continuing assessment of impacts and needs.
5. **Employing effective communication:** Successful recovery is built on effective communication with affected communities and other stakeholders.
6. **Acknowledging and building capacity:** Successful recovery recognises, supports and builds on community, individual and organisational capacity.

Recovery planning by government and communities should incorporate these principles. Focusing on FMD, these principles suggest that pre-planning for FMD recovery will involve Australian Government agencies in identifying those communities (for example, high density farming regions with poor social networks) FMD is most likely to have a heavy impact on and engaging with them to ensure they have adequate recovery plans in place.

Of the six principles, aspects of each with relevance to key issues in Australia are discussed in more detail below.

Understanding the context

Simulation exercises and overseas experience provide some **understanding of the risks faced by communities** affected by an FMD outbreak, and this understanding should be used in recovery planning. Thus, Exercise Minotaur¹¹³ determined that in its scenario, tourism and small business sectors would have been severely impacted. Beyond movement restrictions, a key factor in downturn for these industries was public perception of the possible effect on tourist locations in or near infected areas. For those communities, then, communication strategies designed to restore confidence in tourist locations would have been important for recovery. Similarly, a

¹¹² <http://www.fahcsia.gov.au/sa/communities/pubs/Pages/Recovery.aspx>

¹¹³ <http://www.daff.gov.au/animal-plant-health/emergency/exercises/minotaur>

range of small business, both within the infected and non-infected areas, would have experienced cash flow problems. More communities should be involved in simulation exercises, particularly those facing greater risk and consequences from an FMD outbreak.

Conflict can be avoided by recovery planning that **seeks to address the needs of all affected communities** rather than just certain sectors. For example, considerable resentment and tension between agricultural and non-agricultural businesses was experienced in the United Kingdom when only agricultural businesses received government compensation, despite the significant losses of non-agricultural businesses (for example, tourism and recreation). Similarly, in Australia, the community of Mangrove Mountain was split when benefits were given to chicken farmers but not normal farmers following an outbreak of Newcastle disease which affected all farmers and many other community members.¹¹⁴ Schools and hospitals were also affected during the Mangrove Mountain emergency animal disease outbreak in Australia, and a day-care centre was the first business to close.¹¹⁵

Support for the more vulnerable is important in considering where to target recovery resources. In a national study by the University of Western Sydney on psychological distress suffered by horse industry participants during the Australian equine influenza outbreak, 34% of survey respondents reported high psychological distress.¹¹⁶ Those more vulnerable to high psychological distress were younger people (16-24 year olds), and those with lower levels of formal educational qualifications. Respondents whose principal source of income was from horse industry-related activities were also more likely to have high psychological distress, along with those living in or nearby areas with a high risk of infection.

Recognising complexity

Successful recovery acknowledges the complex and dynamic nature of emergencies and communities.

Animal disease disasters may have commonalities, but any disaster tends to be unique due to a range of factors. This, coupled with the individual needs of differing communities, means that the recovery process for each community is quite specialized. For example, in a 2005 study which asked four Australian communities

¹¹⁴ *ibid*

¹¹⁵ E Barclay (2005) Local community preparedness for an Emergency Animal Disease outbreak. RIRDC, Canberra. <https://rirdc.infoservices.com.au/downloads/05-131>

¹¹⁶ M Taylor (2011) Factors associated with high psychological distress in horse industry participants during the 2007 Australian equine influenza outbreak and evidence of recovery after 1 year. *Australian Veterinary Journal*, 89:158-9.

to identify barriers to emergency animal disease recovery and resilience, four very different, community-specific answers were received.¹¹⁷

Thus, any recovery planning for FMD will need to acknowledge that **affected individuals and communities have diverse needs, wants and expectations—which are immediate and evolve rapidly**. Thus, those already experiencing financial difficulty (for example, from drought) before an outbreak will have the most immediate need. During the equine influenza outbreak in Australia, despite only a single species being affected, different sectors within the horse industry and associated industries quickly expressed different views on both response and recovery measures. For example, the Thoroughbred Breeders' Association wanted general (non-emergency) voluntary vaccination introduced in Australia, but the Australian Horse Industry Council, Australian Veterinary Association and Harness Racing Australia are strongly opposed to such a move.¹¹⁸ The example given also demonstrates how **conflicting knowledge, values and priorities among individuals, communities and organizations create tensions**. In the United Kingdom, after the FMD outbreak conflict arose between tourists wanting access to privately owned land for recreation (for example, tramping, hiking) and farmers concerned that such access would increase the risk of disease to properties.¹¹⁹

Another complexity of recovery is that **information on impacts is usually limited at first and changes over time**. For example, the impact of equine influenza on elite equestrian sport and elite breeding in Australia only became apparent months and years after the outbreak event, while in an FMD outbreak the loss of assets (such as livestock) and fixed capital (entire businesses becoming insolvent) can have long-term effects on industry and economic growth in regions. Also, in Yorkshire, during the first three months of the FMD outbreak the coroner investigated and found three out of four suicides were directly linked to FMD.¹²⁰ However, 15 months later a report identified a much higher teenage suicide rate, with 15 suicides related to FMD.¹²¹ Recovery planning needs to be designed to respond to these kinds of newly identified and changing impacts.

Recovery planning should also recognise and address the **long-term legacies** of animal disease outbreaks and response. The psychological stress suffered in the

¹¹⁷ ibid

¹¹⁸ <http://www.ava.com.au/newsarticle/equine-influenza-vaccination-debate>

¹¹⁹ E Barclay (2005) Local community preparedness for an Emergency Animal Disease outbreak. RIRDC, Canberra. <https://rirdc.infoservices.com.au/downloads/05-131>

¹²⁰ <http://apt.rcpsych.org/content/11/4/270.full>

¹²¹ E Barclay (2005) Local community preparedness for an Emergency Animal Disease outbreak. RIRDC, Canberra. <https://rirdc.infoservices.com.au/downloads/05-131>

United Kingdom due to FMD and control measures was frequently long-term. Stress was caused by a range of factors including: financial concern, loss of sick or healthy animals to either disease or preventive culling, witnessing slaughter, animal welfare concerns caused by movement restrictions, long delays in the burial or removal of culled animals and isolation. The result of this stress is revealed by the results of a National Farmers' Union survey, in which forty per cent of livestock producers said they would not return to livestock farming.¹²²

Quick action to address immediate FMD disaster needs is both crucial and expected¹²³ and will require the continued involvement of, and interaction between, emergency response and recovery agencies. To further address this need, the Australian Government should maintain a register of current jurisdictional recovery programs which (even if requiring some adjustment) could be applied to an FMD outbreak. A suite of 'off-the-shelf' community recovery modules should also be developed which are FMD specific, to complement the DAFF *Guidelines for Local Government for Agricultural Emergencies*.

Using community-led approaches

It is important to include local communities in the development process for recovery policies and programs because of their local understanding and insight.

Recovery management and plans should **consider the culture and priorities of all affected communities**. Risk research has shown that local people have a good understanding of the risks they face.¹²⁴ However, the priority they attach to a risk may not be shared by those from outside the community. Local communities will often identify outbreak risks (such as feral animals) that government planners and emergency responders consider irrelevant or trivial, and vice versa. However, by addressing these concerns with practical advice and information, communities may more readily accept external (for example, state and national government) recovery initiatives and concepts (such as improved biosecurity) in planning recovery. **Existing community knowledge and values may also challenge the assumptions of those outside the community** about what the community needs for recovery. For example, plans to introduce more web-based information in the United Kingdom may be ineffective unless farmers there become more computer-literate. Currently only fifty per cent of farmers use computers and the average age of farmers is 55 years. Again,

¹²² <http://www.abc.net.au/rural/fmd/s285392.htm>

¹²³ http://www.dhcs.act.gov.au/_data/assets/pdf_file/0013/212314/The_National_Principles_for_Disaster_Recovery_designer.pdf

¹²⁴ E Cole & P Buckle (2004) Developing community resilience as a foundation for effective disaster recovery. The Australian Journal of Emergency Management, Vol. 19 No. 4, November: 6-15.

addressing local knowledge and values is the key to developing recovery plans acceptable to communities.

Employing effective communication

Successful recovery is built on effective communication with affected communities and other stakeholders.

During the real and simulated response to emergency animal disease epidemics, communication attention is often focused on technical information, control measures and disease reporting, and the social impacts of the disaster are put aside. However, **addressing social impacts is important** for community recovery. Including a local small business or farmer representative in response communication would maintain the focus on social impacts in outbreak communications.¹²⁵

Acknowledging and building capacity

Successful recovery recognises, supports and builds on community, individual and organisational capacity.

In general, socially disadvantaged communities with poor economic performance are least likely to recover quickly. Other factors that contribute to recovery include the community's size, history of dealing with change and the strength of its networks. The ability of displaced workers to find alternative employment is another key factor.¹²⁶

Governments are rarely able to meet all the needs of affected people. Experience at home and abroad shows that in disaster management situations, emergency services and governments concentrate on hazard control and industry compensation, but recovery support typically comes from local people.¹²⁷ Thus, recovery planning should **identify and mobilise existing community skills and resources** in areas such as: personal support; outreach programmes; childcare; financial assistance for homes and farms; personal hardship grants; locally provided clean up; social activities and community development.

Existing community support networks provide support in the event of an FMD outbreak and where networks are identified as weak, planners should **develop networks and partnerships to strengthen capacity**.

¹²⁵ Barclay, *ibid*.

¹²⁶ *ibid*

¹²⁷ E Cole & P Buckle (2004) Developing community resilience as a foundation for effective disaster recovery. The Australian Journal of Emergency Management, Vol. 19 No. 4, November:6-15.

Part of effective recovery planning is **assessment of gaps between existing and required capability and capacity**. Where local government emergency action plans are already in place, recovery planning requires awareness of the factors within communities that will facilitate or impede the enactment of such plans. Awareness is also required of what impact the enactment of plans may have on communities and the implications for recovery.

Recovery planning should also help communities to acknowledge that **existing resources will be stretched, and that additional resources may be required**. This can then be addressed by creating further resources and/or identifying external sources, such as neighbouring areas. Resistance to external resources may need to be overcome, as research of service provision for farmers during the 1996 drought found that support from local, familiar and trusted agencies within rural communities is preferred over government or external agencies.¹²⁸ Planners should **recognize that FMD recovery resources can be provided by a range of stakeholders** ranging from churches; voluntary, industry and interest group bodies; women's groups; farmers' unions; and help lines.

A strategy similar to the United Kingdom's rural stress action plan¹²⁹—which addresses significant and enduring psychological impacts on farm families, unemployed workers and emergency personnel—could be used to extend community resources in Australia. Developed by DEFRA, such a plan could also be used in Australia to **provide opportunities to share, transfer and develop knowledge, skills and training for recovery**.

CONCLUSION

While comprehensive recovery planning is required for effective national and community recovery from an FMD outbreak, existing national and community disaster recovery resources lack the necessary plans specific to emergency animal diseases, and FMD. In the absence of preplanning, governments may well be forced to implement community compensation and recovery arrangements on an ad hoc (and possibly inconsistent) basis.

Governments should maintain a register of current jurisdictional recovery programs or program options, which (even if requiring some adjustment) could be applied to an FMD outbreak. A suite of 'off-the-shelf' community recovery modules should also be developed which are FMD specific, to complement the DAFF Guidelines for Local

¹²⁸ Barclay, *ibid*.

¹²⁹ <http://archive.defra.gov.uk/rural/documents/living/tackling-stress0106.pdf>
<http://archive.defra.gov.uk/rural/living/stress.htm>

Government for Agricultural Emergencies. Formal links between recovery and control agencies should be strengthened and greater forward recovery planning undertaken, to better manage the impacts of an FMD outbreak and control measures undertaken. The Australian Government National Principles for Disaster Recovery sets out principles for effective recovery and these should be adopted in recovery planning.

RECOMMENDATIONS

The Review Team recommends that:

1. A whole of government approach to FMD outbreak recovery forward planning should be promoted through DAFF's membership of the Australian Government Disaster Recovery Committee, and the existing formal links between recovery and disease control agencies. The inclusion of local recovery planners, farmers and community people in FMD simulation exercises conducted by all levels of government should be used as a method for engaging communities identified as at risk of greater FMD impact.
2. All jurisdictions should have in place comprehensive FMD and emergency animal disease recovery strategies for communities and industries. To ensure consistency, these should be based on broad guiding principles, such as consistency with the principles, strategies and actions set out in the recovery-relevant manuals of the Australian Emergency Manuals¹³⁰ series and the *Australian Government National Principles for Disaster Recovery*.
3. There is still a need to raise awareness across rural Australia about the potential social impact of emergency animal diseases and the need for recovery plans. The Australian Government should act to ensure community leaders of high risk areas (those highly dependent on livestock production) consider the issue and revise their local disaster management and community recovery plans to include emergency animal diseases, particularly for FMD.
4. The Australian Government should maintain a register of current jurisdictional recovery programs which (even if requiring some adjustment) could be applied to an FMD outbreak. A suite of 'off-the-shelf' community recovery modules could also be developed which are FMD specific. Assistance should also be provided, if requested, in developing community-specific plans in high risk areas.

¹³⁰ http://www.ema.gov.au/www/emaweb/emaweb.nsf/Page/Publications_AustralianEmergencyManualSeries_AustralianEmergencyManualSeries

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5. The Industry Liaison Officer program should be encouraged for various groups (including farmers) to encourage FMD recovery planning awareness and to facilitate the flow of recovery planning information between government and the community.
6. A one-size-fits-all approach to recovery is unlikely to be effective. Rather, recovery planning and management needs to ensure that the specific and changing needs of affected communities are met with flexible and adaptable policies, plans, and services. This may mean that within jurisdictional frameworks of planned recovery arrangements, the timing, shape, range and commitment to activities are wholly the community's own.

Appendices

Appendices

APPENDIX 1: ABOUT FMD

FMD is a highly infectious animal disease caused by a virus. Its clinical signs include lameness and blisters in or around the mouth and on hooves. Signs of FMD are easily recognised in cattle and pigs, although sheep often do not display symptoms and their infection can go unnoticed. FMD does not usually cause death in livestock, except in young animals. However, infected animals may suffer acute stress and pain and even following recovery their long-term health and condition may be affected, with serious production and economic impacts.

FMD spreads most effectively when susceptible animals are closely confined. Virus is present in the excretions (mainly faeces) and secretions such as milk, saliva and breath of infected animals. Animals become infected through inhalation or contact of the virus with mucosal membranes, especially in the mouth and nostrils.

Cattle and sheep are very susceptible to airborne virus. Pigs are relatively resistant to airborne virus but very susceptible to contact infection, such as by eating infected feed. Infected pigs excrete large amounts of airborne virus—hundreds of times more than cattle—but cattle excrete the most virus in total because they produce large amounts of infectious faeces and milk. Airborne FMD virus can be carried great distances on wind plumes depending on weather conditions. For example, the 1981 FMD outbreak on the Isle of Wight was caused by a virus plume from Brittany, France.

There are seven different forms (serotypes) of FMD virus: types O, A, C, Asia 1, SAT 1, SAT 2 and SAT 3. Each serotype produces a distinct response in an animal's immune system, triggering a different set of antibodies. This means that even if an animal has immunity to a type A FMD virus, it may still be susceptible to FMD caused by a type O virus. FMD viruses evolve, so for each serotype there are several different strains. Within those strains there are different sub-strains—called 'isolates'—which derive from individual outbreaks. The 2001 United Kingdom epidemic was caused by the PanAsia strain of FMD type O virus.

AUSVETPLAN provides the following as key factors in the epidemiology of the disease:

- The disease is highly contagious, spreading by aerosols and with movements of infected or contaminated animals, products, fomites and people.
- Large amounts of virus are excreted by infected animals before clinical signs are evident.
- Pigs are mainly infected through ingesting contaminated feedstuff.
- Pigs excrete large amounts of virus in respiratory aerosols and, as the main amplifying hosts, are extremely important in disease spread.
- Cattle are mainly infected by inhalation of contaminated aerosols.
- Infected sheep and goats may show mild or unapparent signs, and therefore they may be important in the maintenance and spread of disease.

Appendix 1: About FMD

- Winds carrying virus can spread the disease over considerable distances under suitable climatic and environmental conditions.
- Some recovered cattle, buffalo and sheep (but not pigs) remain long-term carriers; cattle may harbor virus in the pharynx for more than 2 years, and sheep for 9 months.¹³¹

¹³¹ This section is based on: Animal Health Australia (2010). Disease strategy: Foot-and-mouth disease (Version 3.2). Australian Veterinary Emergency Plan (AUSVETPLAN), Edition 3, Primary Industries Ministerial Council, Canberra, ACT.

APPENDIX 2: POSSIBLE IMPACTS OF FMD

The Productivity Commission produced a report in 2002, assessing the potential economic, social and environmental impacts on Australia of a range of hypothetical FMD outbreaks. The report examined the impact on beef and dairy cattle, sheep and pigs arising from two main sources:

- cost of control and eradication of the disease
- cost of closure of export markets for affected livestock and meat products.

The Review Team commissioned ABARES to revisit the Productivity Commission's 2002 report and update the analysis to better reflect the current situation. ABARES found that while the relative sizes of the affected industries have remained similar since 2000-01, the production and export values have declined in real terms. This implies that the potential economic cost of an FMD outbreak today would be slightly lower.

However, some of the simplifying assumptions used by the Productivity Commission could be viewed as overly optimistic—for example, the time expected for trade to be re-established after the last infected animal is stamped out. This is expected, realistically, to be longer than the three months used in the Productivity Commission's estimate.

Considering these balancing factors, then, it is expected that the previous Productivity Commission estimate of the impacts of FMD would be broadly applicable to the current market situation faced by the affected industries.

Results from economic modelling

The Productivity Commission used a range of techniques to quantitatively and qualitatively analyse the likely economic and social impacts of the disease on farmers, farming communities and the environment. Among these was the use of the Monash Multi-Regional Forecasting model of the Australian economy to estimate economy-wide impacts of FMD outbreaks. The results of this economic modelling are presented below.

Direct impacts

The direct economic impacts of FMD arise from two sources: lost export revenue due to trade restrictions; and lost revenue to producers on domestic sales due to a lower price resulting from excess supply. These direct impacts are estimated utilising a Trade and Production Model developed in-house by the Productivity Commission.

For the 12 month outbreak, average farm cash receipts of all broadacre farms were estimated to fall by 26 per cent in the first year as the domestic prices of livestock products fall. Farm level impact depended on the industry: the estimated reduction in average cash receipts ranged from 8 per cent for farms producing predominantly wheat, to 70 per cent for farms producing predominantly beef cattle. While income losses for smaller farms are proportionately larger than income losses for larger

Appendix 2: Possible impacts of FMD

farms, the Productivity Commission notes that a farm's ability to cope with income losses would depend on its debt and equity levels at the time of outbreak.

Income losses to the livestock and meat processing sector were estimated to be \$7.1 billion for a three month outbreak, \$9.5 billion for a six month outbreak and \$16.0 billion for a 12 month outbreak in 2009-10 dollars (Table 1). In all three scenarios, the loss of export revenue is larger than the loss of revenue on domestic market sales. The percentage share of export revenue lost increases with the length of the outbreak as trade restrictions continue for a longer period.

Table 1: Direct income losses for the livestock and meat processing sectors (in \$2009-10)

	Export revenue losses		Domestic revenue losses	Total revenue losses
	\$ million	Per cent of total revenue	\$ million	\$ million
Small	4,175	58	2,973	7,148
Medium	5,776	61	2,994	9,527
Large	11,875	74	4,174	16,049

(Source: Productivity Commission 2002)

Other key findings of the analysis include:

- The bulk of the income losses are accounted for by the beef industry because a large share of beef production is exported.
- Income losses were largest for Queensland followed by New South Wales and Victoria. Income losses in Queensland come mainly from beef; in New South Wales from beef, sheep and pork; and in Victoria mainly from dairy.
- The direct impact also includes job losses in livestock production and meat processing industries. A 12 month outbreak is estimated to result in a 30 per cent reduction in employment in both beef cattle and meat processing industries in the first year.
- For the 12 month outbreak, ring vaccination is found to reduce the income losses to livestock industry by \$1.3 billion to \$3.1 billion. This should be compared with the cost of general vaccination estimated at \$163 million. For the same scenario, zoning was found to reduce the losses by \$10.7 billion or by two-thirds.

Economy wide impacts

The Productivity Commission also modelled the economy-wide effects of an FMD incursion based on production, export and price changes from its Trade and Production Model. For the large outbreak, the Australian Gross Domestic Product (GDP) is estimated to be reduced by between \$10.3 billion and \$16.7 billion over 10 years (this is equivalent to a one to two per cent reduction in GDP for one year). The economy-wide effects are similar to the direct industry impacts because they include

offsetting benefits to consumers of lower prices arising from the loss of export markets. It should be noted that direct and economy-wide impact estimates are not additive. That is, the direct impacts are implicit within the economy wide impacts.

The Productivity Commission found that reductions in GDP were concentrated during the first six years, with the economy finally recovering eight years after the eradication. The pastoral, livestock and meat processing industries were significantly affected with a contraction of economic activities ranging from 20 to 40 per cent. Other industries such as poultry and agricultural machinery were also affected but to a smaller extent.

Contraction in economic activities is estimated by the Productivity Commission to reduce aggregate employment by 0.5 per cent in the first year. Employment level is projected to recover to pre-outbreak level by around nine years after the eradication. Employment effects were most severe in agricultural, livestock and meat processing industries.

A large fall in livestock product exports is estimated by the Productivity Commission to lead to a 2.5 per cent depreciation of the Australian dollar in the first year, which will continue to remain low in value for nine years. The lower Australian dollar is projected to increase mining and some manufacturing exports.

It can be expected that due to the slight contraction of the FMD affected industries relative to the expanding Australian economy—which grew over 32 per cent during the same period—the impact on GDP of an FMD outbreak will be proportionally smaller than the Productivity Commission’s results.

CONCLUSIONS

Based on data in 2000-01, the Productivity Commission estimated that over a ten year period there would be severe direct economic losses to the livestock and meat processing sector from an outbreak of FMD. These losses ranged from \$7.1 billion for a small three month outbreak, to \$16.0 billion for a large 12 month outbreak (expressed in current dollar terms). The Productivity Commission also estimated the economy-wide effects of a large outbreak, as an alternative measure. Economy-wide effects were estimated to reduce Australian GDP by between \$10.3 billion and \$16.7 billion (in current dollars) over ten years, which is equivalent to a one to two per cent decline in GDP in one year. Control and compensation costs were estimated to range between \$25 million for the small outbreak, and \$600 million for the large outbreak. Reflecting international experience, the economic impact of trade restrictions (export markets closures) would be far greater than the cost of controlling the disease.

The message is clear, investment in prevention and preparedness is a prudent insurance policy against such sizable potential losses.

APPENDIX 3: THE EMERGENCY MANAGEMENT AND BIOSECURITY CONTINUUMS

The emergency management continuum

The key elements of the emergency management continuum that have been considered as a fundamental platform of this assessment are:

- Anticipation
- Prevention
- Detection
- Preparedness
- Response

While these elements are separated for analytic purpose in this assessment—including the consideration of detection as a stand-alone element—it is important to recognise that each element affects the other, and that they are not phases undertaken sequentially only after the preceding phase is finished.

The biosecurity continuum

The term 'biosecurity continuum' refers to the Australian Government, state government and industry systems and measures that occur pre-border, border and post-border. These systems and measures contribute to the mitigation of disease risks and their management in the event of a disease incursion. They include:

Pre border

- Import risk assessment processes
- Intelligence gathering and scanning activities
- Pre export quarantine arrangements
- Adequacy of international standards and disease reporting
- Capacity building activities in neighbouring countries and the region
- Off-shore audit activities

At the border

- Inspection of passengers and goods and associated documentation
- Border policies, regulations and operational procedures
- Interception data and post-entry follow up and audit activities

Post-border

- Surveillance systems (active and general surveillance)
- Detection and reporting mechanisms (early warning systems)
- Emergency animal disease response policies and arrangements
- Response capabilities (including manpower, facilities and laboratory capacity)

Appendix 3: The biosecurity continuum

- Communication, awareness and training activities.

Australia has a suite of complementary arrangements in place across the entire biosecurity continuum (pre-border, border and post border) that work together to protect our animal health status. No border system alone can completely eliminate the risk of disease incidents. Rather it is a strategic combination of activities across the continuum that provides Australia with the prevention, preparedness and response capacities that underpin our global trade in animals and animal products, and maintains the health of our animals, environment and community.

The table below represents the entities involved in the biosecurity continuum.

AREA	RESPONSIBILITY	FUNCTION
OCVO	DAFF	Capacity building
Animal Biosecurity	DAFF	Recommendations on scientific, technical and administrative measures for imports
Director of Animal and Plant Quarantine	DAFF	Approves biosecurity policy
Permit issuer	DAFF	Approves permit (consistent with approved biosecurity policy)
Competent Authority	Exporting country	Sets biosecurity controls for exports
Producer/exporting company	Exporting country	Conforms to biosecurity controls for exports
Customs Broker	Third party arrangement	Submits import documentation
Quarantine Officer	DAFF	Allows entry of product
Transport company	Third party arrangement	Transports product to approved location
Quarantine Approved Premises	Third party arrangement	Stores imported product (as specified)
ICE	DAFF	Programmed inspection of imported containers and contents
Investigation & Enforcement	DAFF	Ensure compliance and detect fraud
OCVO	DAFF	Coordinate and act on post-border issues
State and territory Veterinary Offices	States and Territories	Agricultural policies and health in general, detection, control, eradication [as part of the biosecurity continuum]
Private veterinarians	Third party (co-regulatory	Clinically examine, refer tests/information and treat animals

Appendix 3: The biosecurity continuum

	arrangement)	
Animal owner		Responsible for biosecurity controls, health of animal, notification of problems

APPENDIX 4: INTERVIEWS CONDUCTED

DATE	BODY	PERSONNEL
17 February		Juan Lubroth, CVO, FAO
22 February	DAFF Canberra: Animal Division	Peter Beers Graeme Garner Leigh Nind Andrew Cupit Peter Hewitt
9 March	DAFF Canberra: Livestock Animal Imports	Helen Walker Murli Baker-Gabb
16 March	DAFF Canberra: Investigations and Enforcement	David Franks
18 March	DAFF Canberra: Quarantine Operations—Entry Management	Robyn Fraser
18 March	DAFF Canberra: Quarantine Operations—Sea Cargo	Lindy Cayzer
23 March	DAFF Canberra: Animal Division	Richard Rubira
29 March	DAFF Victoria: Management	Dennis Way Malcolm Keen Mark Whattam Gaylene Podhajski Peter Ninnis Kathy Belka
29 March	DAFF Victoria: import documentation	Julie Brachmanis
30 March	DAFF Victoria: Melbourne Airport	Ben Wilson

Appendix 4: Interviews conducted

	passenger operations	
30 March	DAFF Victoria: port operations	Sonia Zoric David Blair James Collela
30 March	DAFF Victoria: Traceability	Gaylene Podhajski Peter Ninnis
30 March	DAFF Victoria: Melbourne Airport mail operations	Joe Sterling Nicolas Kastanas
7 April	Quadrilateral Meeting (New Zealand)	John Clifford, US Department of Agriculture Jane Rooney, US Department of Agriculture Michael David, US Department of Agriculture Francine Lord, Canadian Food Inspection Agency Debbie Barr, Canadian Food Inspection Agency Derek Belton, New Zealand MAF David Hayes, New Zealand MAF
11 April	AHA Symposium on FMD	AHA, government and industry representatives, Gardner Murray giving a keynote presentation
12 April	DAFF: Quarantine Operations (Executive)	Wayne Terpstra
15 April	National Farmers Federation	Matt Linnegar, Chief Executive Officer
15 April	Animal Health Australia	Mike Bond Peter Dagg Kevin de Witte
6 April	Sheepmeat Council of Australia	Ron Cullen, Executive Director
9 May	Australian Animal Health Laboratories	Martyn Jeggo, Director Wilna Vosloo, Manager Agent Detection Group Sam McCulloch, Diagnostic Services Manager
10 May	Victoria State: Chief Veterinary Officer and animal laboratories	Andrew Cameron, CVO Malcolm Ramsay Roger Paskin Bronwyn Murdoch

Appendix 4: Interviews conducted

		Simone Warner Ian Jerrett
11 May	DAFF Queensland: seaport operations	Steve Goener Peter Walsh
11 May	Queensland State: animal laboratories	David Waltisbuhl, Animal Laboratory Manager Barry Rodwell Fiona Thompson Greg Storey Gary Horner Wendy Townsville
12 May	DAFF Queensland: airport operations	Ian Thompson David Daly
12 May	DAFF Queensland: Management	Col Hunter Paul Nixon Suzanne Blake Ian Thompson Steve Goener Paul Hollingsworth Geoff Parker
16 May	Queensland State: Chief Veterinary Officer	Rick Symons, CVO Allison Crook David Waltisbuhl, Animal Laboratory Manager Fiona Thompson
18 May	National Farmers Federation: Biosecurity and Animal Welfare Committee	Bill Bray, Biosecurity and Animal Management Committee Chairman Kevin Doyle, Australian Veterinary Association Ron Cullen, Sheepmeat Council James Jackson, Sheepmeat Council Peter Carter, NSW Farmers Federation Ron Thirkell Johnston, Tasmanian Farmers and Graziers Association Matt Linnegar, CEO, NFF Lach MacKinnon, Australian Livestock Exporters Council

Appendix 4: Interviews conducted

		Wayne Harvey, Victorian Farmers Federation Cameron Clark, NSW Farmers Association James Jackson, Sheepmeat Council of Australia Alex Stubbs, AgForce Queensland Jo Hall, Wool Producers Australia Kevin Shiel, Australian Dairy Farmers
19 May	DAFF: Plant Division (Executive)	Bill Magee
20 May	DAFF: Animal Division (Executive), Strategic Projects	Andrew Cupit David Buckley Sal Thomson
14 June	DAFF: Animal Division (Executive)	Jenny Cupit

APPENDIX 5: SUMMARY OF RECOMMENDATIONS

Issue 1: Australia's national capability to anticipate an FMD outbreak and to translate warning intelligence into action

The Review Team recommends that:

1. A capacity for intelligence gathering, analysis and policy translation be established and nurtured as new core capabilities within the animal health services of DAFF. As well as seeking to embed such capabilities throughout the organisation, this will require the establishment of:
 - A foresighting, scanning and intelligence gathering unit, with the purpose of gathering intelligence relevant to FMD, in the first instance. Over time, the unit's role could be broadened to other animal disease and biosecurity threats and emergencies.
 - A decision-making group whose role would be to consider recommendations from the multi-disciplinary analysis unit and the National FMD Intelligence network (see below). Alternately, this function could be worked into the terms of reference of the current Biosecurity Management Group. Where possible, decision-makers should be the managers responsible for the policy or operational areas in question.
2. DAFF establish and lead a National FMD Intelligence Network involving external stakeholders—including states and territories, industry representatives and experts from a range of disciplines—that meets regularly to conduct foresighting activities and share strategic intelligence.

The network should develop regular reports for the Australian Chief Veterinary Officer.
3. Foresighting and strategic intelligence skills should be fostered within biosecurity organisations by including these skills within organisational development programs, business planning and performance agreements.
4. The Australian Government should maintain and strengthen its existing international animal disease intelligence networks and pre border activities that will contribute to Australia's strategic intelligence capability.

Issue 2: The standard of assurances that exporting countries' Competent Authorities are operating to Australian biosecurity requirements

The Review Team recommends that:

1. A program of regular and periodic reviews of overseas competent authorities and exporters should be developed. Where warranted, in-country verification should be undertaken.
2. Targeted statistical collection of data and the use of intelligence gathering (as discussed at Issue 1) should be adopted into import business processes to inform decisions on priority targets for review.

Issue 3: The possibility of illegal importation of animal products

The following recommendations aim to address the main systemic issues around FMD entry through illegal importation, and support the department's efforts in focusing resources on the areas of highest risk.

The Review Team's recommends that:

1. DAFF set out a firm timeframe to complete as soon as possible the current process of operational transformation to a fully risk-based system of quarantine inspection priorities at the border. Priorities need to be continually updated to better target higher quarantine risk importers, exporters, source countries, agents, transporters and product types (for example, refrigerated cargo).
2. The integrity of the Broker Accreditation Scheme should be enhanced through a program of more frequent audits—including physical inspections of cargo to ensure compliance. The frequency of such audits should be both performance-based and risk-based. Thus, the broker's history of compliance and the inherent risk posed by the types of products being imported will determine audit frequency. A system of effective sanctions for non-compliance should be developed and publicised including summary withdrawal of accreditation.
3. The integrity of arrangements for Quarantine Approved Premises (QAP) should be tightened by requiring QAP operators to meet fit and proper person standards, and by increasing the frequency of audits according to quarantine risk and past QAP operator performance. Again, a system of effective sanctions for non-compliance should be developed and publicised including summary withdrawal of accreditation.
4. The veracity of import documentation presented to quarantine officers should be more systematically verified where such documentation provides crucial assurances for high quarantine risk imports. Because resources are limited, such systematic checks should be risk based: on both the history of compliant performance by document providers, and the level of risk tied to the country of origin, product, exporter, broker and importer.
5. The ICE system should be applied more regularly to refrigerated containers, with more frequent risk-based inspections, and inspections that confirm seals are intact (that the container has not been opened prior to inspection). The current DAFF-proposed improvements to the ICE system should be progressed as a matter of priority, with the system becoming a more independent, evaluative and audit-based system, less dependent on inspection operations staff.
6. The incidence of rural tailgate inspection bypasses should be reduced by clearly establishing—if necessary through legislative change—the party responsible for complying with the quarantine inspection direction, and by establishing effective sanctions for non-compliance.

7. Closer collaboration with Customs should be encouraged, including collaboration on how to use Customs systems to more effectively target imports of potential quarantine concern. The team recommends that DAFF consider approaching Customs proposing the establishment of a joint agency reform team working to results-oriented terms of reference with timelines. The reform team should be accountable to senior management of both agencies for real progress.

Issue 4: The effectiveness of swill feeding prohibitions

The Review Team recommends that:

1. The Australian Government, in collaboration with the states and territories, implement a national campaign aimed at:
 - increasing awareness of swill feeding prohibitions amongst small-scale producers (including non-English speaking communities) and high-risk areas within each state
 - increasing investigations targeted at high-risk areas
 - harmonising legislation across all jurisdictions.
2. A national registration system is established that records the location of all small-holdings and is used to target inspection and enforcement programs (by identifying higher-risk small-holdings with proximity to high-density commercial livestock holdings).
3. The legislated provisions in some jurisdictions allowing licensed producers to feed 'treated' swill should be removed.
4. A national swill feeding investigation and reporting system be adopted that includes uniform inspection procedures, and communicates swill feeding investigation outcomes to central organisation such as AHA and the DAFF Foresighting Unit recommended in Issue 1.
5. AHC urgently finalise its work on swill feeding as a national priority with the support of the Australian Government.

Issue 5: Australia's capacity to sustain a large-scale FMD response

The Review Team recommends that:

1. Better national guidance on likely resource requirements in a severe case outbreak should be developed for Australia. In the meantime each jurisdiction should calculate the potential resources required to respond to a severe outbreak scenario of disease taking into account livestock populations of species likely to be affected in each state, and the range of functions that would be required in a response.

A national stocktake of current resource capacity should then be undertaken, benchmarking the number of trained personnel (veterinary and other

professionals) in each state. Consideration should be given to the resources that would be available at different intervals of the response (during and immediately following, after one month, and after two months) to contribute to a FMD response effort.

The stocktake should assess the potential time lags between request for resources and their actual deployment, and should take account of the full suite of skills likely to be required. Strategies to address specific gaps should then be developed on both a state and national basis.

2. Contingency plans in each jurisdiction should then be revisited to ensure the resource requirements can be met to respond to a severe scenario outbreak of FMD in a densely populated area of livestock—based on the assumption that the disease may not be immediately detected.
3. An assessment of Australian veterinary services should be undertaken, using the internationally recognised OIE Performance of Veterinary Services tool, to benchmark Australia's veterinary services against international standards, and identify key gaps and critical areas requiring attention. The assessment should be submitted to the Primary Industries Ministerial Council for consideration.
4. Following on from the OIE Performance of Veterinary Services assessment, measures for maintenance of Australia's veterinary services should be incorporated in the business plans and performance indicators of the Office of the Australian Chief Veterinary Officer and state counterparts.
5. More substantive contingency planning should be undertaken for resourcing the complete suite of all functions that will be required during an emergency. A national register of skilled professionals should be established and maintained by the Australian Government or Animal Health Australia. The register should record the details of individuals willing to be called upon in a response, matching their skills to the functions that will be required. The process should differentiate between the roles and tasks that will need to be performed by veterinary professionals and those that can be performed by others.
6. DAFF, in conjunction with the states and territories, should investigate how contemporary social media could be used to contribute to the communications objectives of an FMD response effort. Current communications plans, which pay little attention to the new media, should then be revisited and updated, along with contingency plans to ensure that skilled communications professionals will be available when required.
7. The Australian Government and Animal Health Australia should enhance the availability of training for industry liaison officers to maintain a standing reserve capacity.
8. Just-in-time training modules should be completed for each category of tasks that will be required in an FMD response.

9. State and territory laboratory staff should be trained so they have the capability to undertake testing for FMD. It is recommended that the LEADDR network progress national standardisation and training for FMD diagnostics.

Clear and agreed policy on the respective roles of AAHL and state/territory laboratories during an FMD emergency should be established as a priority. Each state and territory should ensure advance training and business continuity arrangements are provided to ensure effective support is able to be provided by state laboratories for FMD diagnostics during an emergency response. The Australian and state governments should also ensure that the state veterinary laboratories are equipped in advance to achieve high specimen throughputs during an EAD response and for proof of freedom. A report on these laboratory-related initiatives should be brought back to the Primary Industries Ministerial Council within twelve months of acceptance of this recommendation.

10. The Australian Government and state agriculture departments should explore Emergency Management Australia arrangements, with a view to prescribing adequate provisions in existing departmental business continuity plans and emergency management plans, to ensure staff are recognised and supported for the efforts that will be made during a response to FMD.
11. Arrangements should be agreed in advance in peace-time for the rapid prioritisation of agency work and the rapid reassignment of agency people and resources to assist with a response. This agreement should be at the highest level within each state-level agriculture department and within DAFF—and reflected in agency business continuity and critical incident response plans.
12. The Australian Government should explore the development of volunteer programs to provide much-needed surge capacity in a response.

Alliances should be formed between governments and rural organisations, the private sector, producer groups and local community groups to explore innovative ways in which a volunteer program making use of local resources could be established to provide emergency reserves to contribute to an FMD response.

DAFF, in collaboration with all government jurisdictions and relevant industry groups, should examine the practicality of establishing a national volunteer reserve of people trained to respond immediately to an outbreak of infectious animal disease.

Issue 6: Traceability arrangements in the sheep industry

The Review Team recommends that:

1. The Australian Government and national sheep industry move to immediately establish a progressive pathway to the adoption of satisfactory traceability arrangements in the sheep industry. Options and

recommendations should be put to the Primary Industries Ministerial Council within 12 months.

2. One regulatory option that should be considered is introducing a requirement that abattoirs, saleyards and private buyers may only accept adequately identified sheep.

Issue 7: Policy on FMD vaccination and associated difficulties in preparing for a short-notice vaccination campaign

The Review Team recommends that:

1. Australia prepare as though vaccination will be an essential component of the response to an FMD outbreak in Australia, while recognising that it will be essential in certain scenarios but may not be required in others. Clear national guidelines on when vaccination would be useful in Australian conditions and decision-making criteria covering the most likely scenarios for vaccine use should be developed and documented as soon as possible.
2. The timeframe for the FMD response policy review should be accelerated. In collaboration with industry stakeholders, AHA and DAFF should seek to reach agreement on outstanding policy issues within six months of the acceptance of this report, to be followed by Primary Industries Ministerial Council endorsement of the updated policy in 2012. The Australian Government, in collaboration with Animal Health Australia, should exercise leadership in driving the resolution of these outstanding issues.
3. To assist with the development of contingency plans that adequately address the human resource requirements of a vaccination campaign, an on-ground simulation exercise should be undertaken to specifically assess the resource requirements of an emergency vaccination campaign across multiple species in each state. The simulation should seek to establish the workforce requirements necessitated by current arrangements (including nationally agreed standard operating procedures and Primary Industries Ministerial Council principles for the use of vaccination) when applied to state livestock populations and a severe-case scenario outbreak. The simulation exercise could also inform the development of policies and operating procedures that would help provide a clearer picture of where and how vaccine would be used.
4. Based on the outcomes of the simulation exercise, DAFF and the states should revisit contingency plans to ensure that trained personnel of sufficient number are available in an outbreak to deliver an emergency FMD vaccination program—from the initial deployment phase through to the proof of freedom phase. Contingency plans should adequately address the issues of just-in-time training, decontamination of vaccination teams, and the management of occupational health and safety issues.

5. Innovative solutions to establishing and training an emergency workforce to carry out the vaccination campaign be considered, including but not limited to:
 - engagement with local communities and associations
 - engagement with producer groups and livestock-related associations
 - engagement with public health institutions, education institutions (such as TAFEs) and student bodies (including medical)
 - both advanced and just-in-time training arrangements.
6. Industry stakeholders—as part of business continuity planning—identify strategies for managing consumer confidence and maintaining the viability of domestic markets.

Issue 8: Preparation for the known challenges of carcass disposal

The Review Team recommends that:

1. Assessments should be undertaken (as soon as possible) in each state and territory to determine the disposal requirements of a severe-case scenario outbreak using stamping out as the primary control measure. The assessment should:
 - establish a reliable picture of the populations of major FMD-vulnerable species (cows, pigs and sheep) and the distribution of these production industries within each state and territory
 - map current commercial slaughter facilities (including rendering plants) and collect information relating to their capacities—including throughput capacity, trained personnel, and the length of time maximum operational capacity can be sustained
 - develop a map of sites currently suitable for mass burial of animal carcasses, taking into account environmental factors, such as water tables, and other regulatory requirements
 - based on the information collected above, assess the jurisdiction's current capacity to dispose of all carcasses within the most densely populated areas of livestock production.
2. Contingency plans should be updated (following the above assessment) to address any shortfalls in jurisdictional disposal capacity. Plans will need to be tailored to address the unique geography, infrastructure and livestock industry demographics in each state and territory.
3. Each suite of disposal options developed for each jurisdiction should be articulated as an appendix to the AUSVETPLAN manual on disposal. In addition, the AUSVETPLAN disposal policy should be updated in accordance with the outcomes of the work program provided above.
4. A risk assessment (consistent with state or territory legislation) of transport and disposal activities required by specific options should be performed and documented prior to an outbreak. Any issues identified by risk assessments

Appendix 5: Summary of Recommendations

should be remedied to ensure immediate implementation of the state's disposal plan will be possible.

5. Novel and innovative methods of disposal should be explored which suit Australian conditions and requirements. Concurrently, a program should be designed to progress policy allowing the safe consumption of meat and products from animals slaughtered for disease control purposes (including infected, vaccinated and at-risk animals).
6. Plans for carcass disposal should be publicly released to gauge public reaction. At the same time an investigation of contemporary public attitudes to animal slaughter and disposal should be commissioned to inform decision makers of likely public reactions well in advance of any outbreak.

Issue 9: The possibility that FMD may not be detected readily and speedily

The Review Team recommends that:

1. A dedicated, continuing national program led by DAFF and delivered in conjunction with the states and territories and relevant livestock industries should be implemented to improve the likelihood of early detection. The program should focus on higher-risk areas (such as areas of densely populated livestock where failure to detect the presence of the disease would carry greater consequences) and should include elements involving traditional surveillance, innovative community-based programs and ongoing training for veterinarians. The program should also consider the use of new technologies to raise awareness and facilitate reporting.
2. Innovative training programs be explored that target groups observing animals on a regular basis (for example, those involved in daily animal production management activities). The use of community-based organisations and other sources of services already utilised and trusted by producers should also be explored.
3. Jurisdictions and industry should revisit contingency and emergency response plans to review assumptions made regarding the likelihood of early diagnosis and reporting of an FMD incursion, and make adjustments as necessary to ensure Australia is well placed to deal with a situation where detection could be delayed. These review processes should include the FMD response policy review currently underway under the leadership of Animal Health Australia.

Issue 10: A lack of clarity about responsibility and accountability for national FMD planning processes

The Review Team recommends that:

1. The post-Minotaur recommendation to '...reconsider the wisdom of consensus decision-making during emergencies' be implemented, including examination of a reserve power for the Australian Government to break

deadlocks in an emergency. If this recommendation is accepted, DAFF should bring forward implementation recommendations within six months.

2. Ambiguity about the national leadership role in FMD should be resolved by assigning the Australian Government through DAFF ultimate leadership responsibility and accountability to the Primary Industries Ministerial Council. This should include a timeline for driving the finalisation by Animal Health Australia of the FMD policy review, and in particular for the finalisation of the draft AUSVETPLAN manual for FMD.

Issue 11: Planning for community recovery

The Review Team recommends that:

1. A whole of government approach to FMD outbreak recovery forward planning should be promoted through DAFF's membership of the Australian Government Disaster Recovery Committee, and the existing formal links between recovery and disease control agencies. The inclusion of local recovery planners, farmers and community people in FMD simulation exercises conducted by all levels of government should be used as a method for engaging communities identified as at risk of greater FMD impact.
2. All jurisdictions should have in place comprehensive FMD and emergency animal disease recovery strategies for communities and industries. To ensure consistency, these should be based on broad guiding principles, such as consistency with the principles, strategies and actions set out in the recovery-relevant manuals of the Australian Emergency Manuals series and the *Australian Government National Principles for Disaster Recovery*.
3. There is still a need to raise awareness across rural Australia about the potential social impact of emergency animal diseases and the need for recovery plans. The Australian Government should act to ensure community leaders of high risk areas (those highly dependent on livestock production) consider the issue and revise their local disaster management and community recovery plans to include emergency animal diseases, particularly for FMD.
4. The Australian Government should maintain a register of current jurisdictional recovery programs which (even if requiring some adjustment) could be applied to an FMD outbreak. A suite of 'off-the-shelf' community recovery modules could also be developed which are FMD specific. Assistance should also be provided, if requested, in developing community-specific plans in high risk areas.
5. The Industry Liaison Officer program should be encouraged for various groups (including farmers) to encourage FMD recovery planning awareness and to facilitate the flow of recovery planning information between government and the community.

Appendix 5: Summary of Recommendations

6. A one-size-fits-all approach to recovery is unlikely to be effective. Rather, recovery planning and management needs to ensure that the specific and changing needs of affected communities are met with flexible and adaptable policies, plans, and services. This may mean that within jurisdictional frameworks of planned recovery arrangements, the timing, shape, range and commitment to activities are wholly the community's own.

