Australian Wool Innovation Limited

PROTECTING THE AUSTRALIAN WOOL PIPELINE: POST-FARMGATE EMERGENCY ANIMAL DISEASE PREPAREDNESS RD&E STRATEGY 2019/20 – 2021/22

MINIMISING THE TRADE IMPACTS OF EMERGENCY ANIMAL DISEASES ON THE AUSTRALIAN WOOL INDUSTRY

Final version approved by
WIA EAD Working Group September 2019
Wool Industries Australia Inc.

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EXECUTIVE SUMMARY

This document outlines a research, development and extension (RD&E) strategy to minimise the potential trade impacts on the Australian wool industry arising from emergency animal disease (EAD) outbreaks.

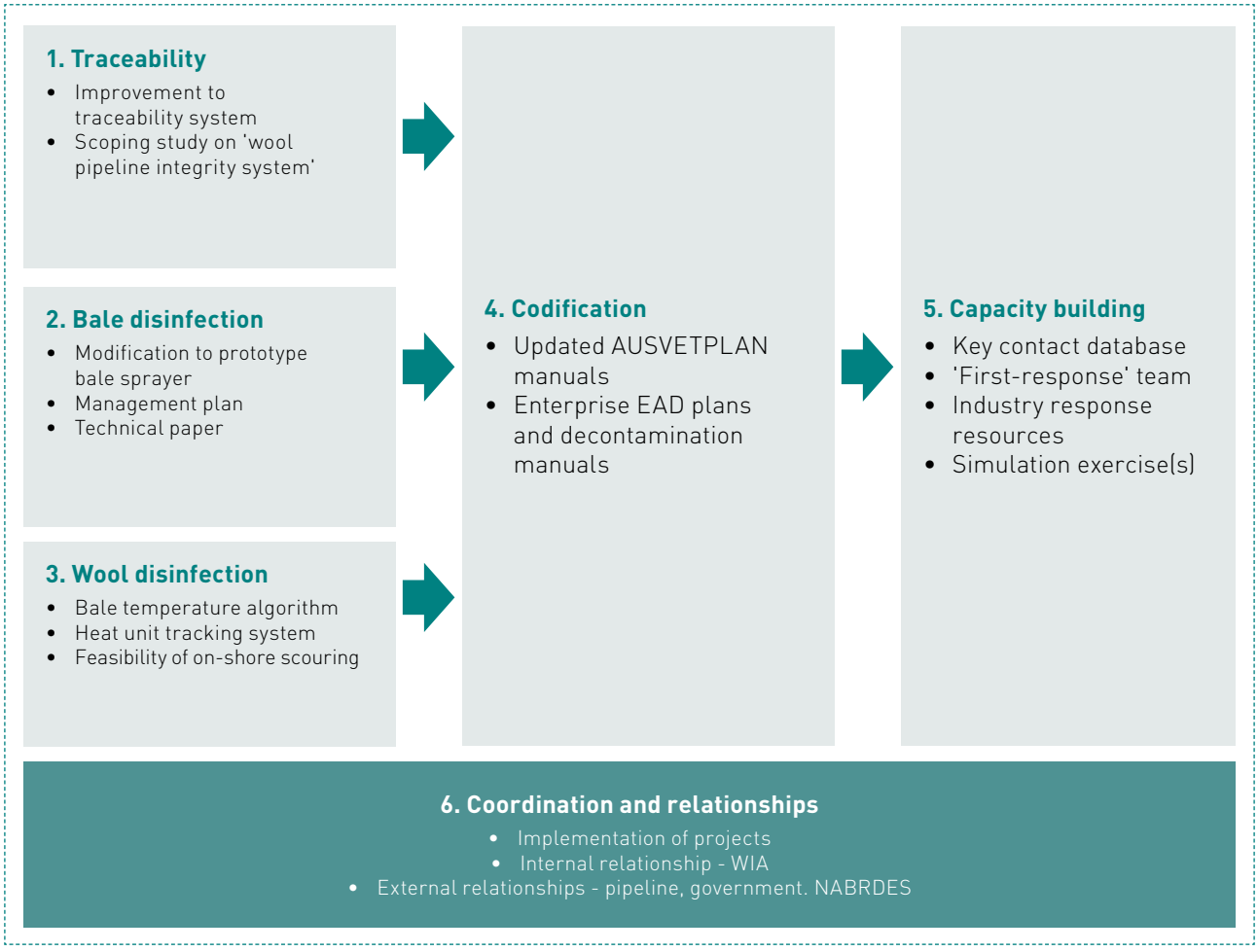
Protecting the Australian wool pipeline: Post-Farmgate Emergency Animal Disease Preparedness RD&E Strategy 2019/20-2021/22 ("the Strategy") specifically addresses the shorn wool pipeline from farm to market. It is concerned with the mitigation of supply chain and trade risks such as product traceability, rather than addressing disease response risks through measures such as diagnostic capability or vaccination.

The goal of this Strategy is to further improve the level of EAD preparedness of the Australian wool industry by putting in place innovations that will, in the case of an EAD incursion:

- Maximise the time-and cost-effectiveness of the Government/industry response;
- Minimise reputational damage to the Australian wool industry;
- Minimise disruption to flows of Australian wool to the world's markets; and/or
- Achieve the most rapid possible return to normal business for wool growers, customers and other participants in the wool industry pipeline.

Specifically, the Strategy seeks to deliver 20% improved capacity of post-farmgate wool industry preparedness for an Emergency Animal Disease, a key performance indicator of the Australian Wool Innovation (AWI) Strategic Plan 2019/20 – 2021/22.

Programs to be delivered under the Strategy are summarised as follows:



The Strategy builds upon two previous three-year strategies, which delivered:

- Advances in wool identification and traceability.
- Developments in bale identification and tracking.
- The development of a prototype bale disinfection device, suitable for application in wool stores.
- Refinements in the described time/temperature relationship for deactivation of foot-and-mouth disease virus in wool.
- Completion of content for several of the AUSVETPLAN manuals to ensure they carry the most up-to-date information on wool and the wool industry, including a new "Wool Industry Enterprise Manual".
- Development and piloting of a half-day EAD awareness workshop for wool store staff.
- Creation of an online biosecurity risk assessment tool and template EAD preparedness plan and guide for wool businesses.
- A range of relationship-building activities with other wool-producing countries and wool industry participants globally, as well as Australian government agencies.

AWI will provide funding for management and coordination of activities under the Strategy, and for individual projects on a case-by-case basis. Other WIA member organisations will continue to contribute cash and in-kind contributions to the achievement of Strategy priorities. Leverage of industry funds will be sought where possible.

Several risks under one strategy have been identified, including a failure to meet Strategy KPIs. Risk mitigation measures have been identified and these generally involve careful selection and management of projects; regular monitoring, evaluation, reporting and improvement of the Strategy; and extensive engagement with internal and external stakeholders.

ABBREVIATIONS AND ACRONYMS

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
AHA	Animal Health Australia
AUSVETPLAN	Australian Veterinary Emergency Plan
AWI	Australian Wool Innovation Ltd
AWEX	Australian Wool Exchange Ltd
AWTA	Australian Wool Testing Authority Ltd
CVO	Chief Veterinary Officer
EAD	Emergency animal disease
EADRA	Emergency Animal Disease Response Agreement
EAD WG	Emergency Animal Disease Working Group (of WIA)
WIA	Wool Industries Australia Inc.
FMD(V)	Foot-and-mouth disease (virus)
IGAB	Intergovernmental Agreement on Biosecurity
KPI	Key performance indicator
NABRDES	National Animal Biosecurity Research, Development and Extension Strategy
NLIS	National Livestock Identification System
IWTO	International Wool Textile Organisation
OIE	World Organisation for Animal Health
PIC	Property Identification Code
RD&E	Research, development and extension
RVF	Rift Valley fever
SPS	Sanitary and phytosanitary
WPA	WoolProducers Australia
WTO	World Trade Organisation

1. PURPOSE

This document outlines a research, development and extension (RD&E) strategy to minimise the potential trade impacts on the Australian wool industry arising from emergency animal disease (EAD) outbreaks.

This Strategy specifically addresses the shorn wool pipeline from farm to market; that is, it is concerned with the mitigation of supply chain and trade risks such as product traceability, rather than addressing disease response risks through measures such as diagnostic capability or vaccination. However, the Strategy has been designed and will be delivered with close regard to disease response and preparedness RD&E carried out by AWI, Meat & Livestock Australia or other bodies.

This Strategy is not confined to foot-and-mouth disease (FMD), although FMD is the yardstick for devastating EADs – the Strategy embraces preparedness for any and all EADs.

This Australian Wool Industry Post-farmgate Emergency Animal Disease Preparedness RD&E Strategy 2019/2020 – 2021/22 is an update of the second such plan, which spanned the preceding three-year period. Changes in this revised strategy take account of progress made under the first and second strategic plans and some minor developments in the EAD operating environment.

The purpose of this Strategy is to:

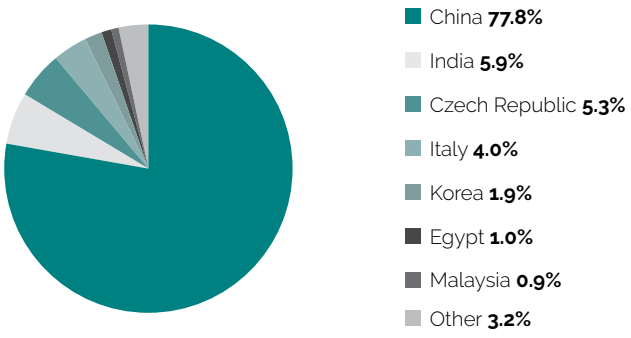
- Identify RD&E priorities for EAD preparedness along the wool pipeline and, in doing so, help to fulfil WoolProducers Australia's (WPA's) obligations under the EAD Response Agreement (EADRA) and the wool industry's commitment to the National Animal Biosecurity Research Development and Extension Strategy (NABRDES) (see below);
- Ensure the identified RD&E is carried out as effectively and efficiently as possible;
- Promote the industry's understanding of the importance of, and its collaboration towards achieving, a well-developed state of EAD preparedness; and
- Establish the mechanisms and culture needed to maintain the industry's EAD preparedness into the future.

2. BACKGROUND

2.1 AUSTRALIA'S POSITION IN THE GLOBAL WOOL INDUSTRY

The Australian wool industry is heavily dependent on exports. In the year from July 2017 to June 2018, Australia exported 339 mkg (greasy equivalent) of wool. Of this, 97% was exported in greasy form, the remainder as scoured wool, carbonised wool, carded wool or noils/ waste.[1]

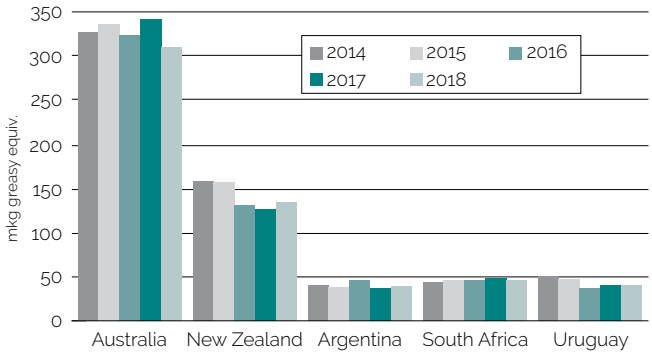
The destinations for Australian wool exports for the year July 2017 to June 2018 are shown in Figure 1. China is by far our dominant trading partner, taking 77.8% of Australia's wool exports, followed by India with 5.9%.



Source: Australian Bureau of Statistics and Australian Wool Industries Secretariat

Figure 1. Australia wool exports by major destination country in 2017/18, greasy and processed

The uninterrupted capacity to export is critical to the Australian wool industry. So too is the global wool trade highly dependent upon Australian exports. Australia dominates the world trade of wool (Figure 2). More significantly, Australia produces around 23% of the world's wool, about 68% of world production of Merino wool and 80% of the world's superfine wool (18.5 microns and finer).[2]



Source: Australian Bureau of Statistics, Federation Lanera Argentina, Secretariado Uruguayo de le Lana, Capewools, Beef + Lamb NZ

Figure 2. Wool exports by the major wool exporting countries, calendar year

Just over 50% of China's annual imports of raw and semi-processed wool are sourced from Australia.[3]

2.2 GLOBAL ARRANGEMENTS FOR EAD RESPONSE

There exists an international framework for the management of animal health and disease in respect to trade. This framework is overseen by the World Organisation for Animal Health (OIE), of which Australia and most other countries (including China) are members. The OIE publishes the 'Terrestrial Animal Health Code', whose aim is to 'assure the sanitary safety of international trade in terrestrial animals…and their products'.[4] The Code underpins the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) among members of the World Trade Organisation (WTO).

The Code details, for each disease, standards for diagnostic testing, disinfection, establishing national or zonal freedom from the disease and so on. The Code also includes a range of general provisions covering animal disease, diagnosis, surveillance and notification; risk analysis; quality of veterinary services; disease prevention and control; trade measures, import/export procedures and veterinary certification; veterinary public health; and animal welfare.

1 Australian Wool Industries Secretariat Wool Exports Report June 2018 and 2018/19, August
2 IWTO Market Information Report, Edition 14, March 2019
3 Poimena Analysis, pers comm
4 OIE website, http://www.oie.int/international-standard- setting/overview/

Australia's EAD response system (EADRA, Australian Veterinary Emergency Plan (AUSVETPLAN) and other components) are consistent with the provisions of the Terrestrial Code. For example, AUSVETPLAN requirements with respect to the time required for any possible FMD virus (FMDV) to be deactivated within a wool bale are identical to those of the Code. This alignment ensures that, as far as possible, the trade response to an EAD outbreak in Australia will be based upon the results of internationally-agreed scientific research.

2.3 AUSTRALIA'S EAD RESPONSE SYSTEM

Animal Health Australia (AHA). AHA is a partnership between the Commonwealth and State/Territory governments, livestock industries and other stakeholders such as the Australian Veterinary Association AUSVETPLAN. WPA is the wool industry member of AHA. WPA's contribution to AHA is funded from a portion of the livestock transaction levy paid when sheep are sold.

Australia's biosecurity framework is strong by international standards. Its elements include:

- The EADRA, in which governments and industries have defined the manner in which Australia will prepare for and respond to EADs from governance, operational and financial perspectives. WPA is the wool industry signatory to the EADRA and has prescribed rights and responsibilities under the agreement (see Section 9. Roles and Responsibilities);
- AUSVETPLAN, an extensive and detailed series of documents detailing the strategies, procedures and underpinning scientific justification for EAD responses;
- The National Animal Health Information System, a database used to collate, manage, analyse and report on data from a range of disease surveillance activities such as the National Significant Disease Investigation Program;
- The National Animal Health Laboratory Network;
- The National Livestock Identification System;
- Various training programs in emergency animal disease response and related areas; and
- The National Animal Biosecurity Research Development & Extension Strategy (see below).

The key players in the event of an EAD event are the State/Territory jurisdictions. It is the jurisdictions (through their respective Chief Veterinary Officers or CVOs) that manage the response to an EAD, and that make decisions about investments in preparedness beforehand. CVOs are an important audience for the outcomes of this Strategy.

Notwithstanding the strengths of existing systems in Australia, there are gaps. The equine influenza outbreak of 2007/08 was considered to have exposed some of these gaps, particularly in quarantine, as identified in the subsequent 'Beale review'.[5] The 'Matthews review' of 2011 also highlighted a number of weaknesses in specific reference to Australia's foot-and-mouth disease preparedness.[6]

More recently, an independent review was undertaken of the capacity of Australia's national biosecurity system to inform the renegotiation of the Intergovernmental Agreement on Biosecurity (IGAB). Among the key findings of the review were that biosecurity risks are increasing while 'a tight fiscal environment for governments has placed significant pressure on biosecurity budgets and the ongoing capacity of jurisdictions to meet their biosecurity commitments'.[7] Anecdotal evidence suggests that various State governments have made considerable investments to improve EAD preparedness and response capability in recent years, but less so in capacity.

In the recently updated National Animal Biosecurity RDE Strategy document (insert reference) it was reported that there is a declining ability of stakeholders to deliver biosecurity services, along with a declining capability, "...particularly because of declining human resources, infrastructure and investment at all levels of government."

5 Beale *et al.* 2008, 'One biosecurity: A working partnership. The independent review of Australia's quarantine and biosecurity arrangements. Report to the Australian Government'
6 Matthews 2011, 'A review of Australia's preparedness for the threat of foot-and-mouth disease'
7 Craik *et al.* 2017, 'Priorities for Australia's biosecurity system: An independent review of the capacity of the national biosecurity system and its underpinning intergovernmental agreement'

2.4 THE WOOL INDUSTRY'S EXPOSURE TO EADs

An EAD outbreak would impose very substantial costs on the wool industry, depending on the specific disease involved. These costs would arise from two principal areas:

1. **The cost of responding to the disease itself.** The EADRA defines cost-sharing formulae for different diseases depending on the extent to which they impact on private versus public good and on the industries considered to be involved. FMD, for example, is a Category 2 disease. Eighty percent of the disease response would be paid for by Commonwealth and State/Territory Governments and 20% by industry, split between cattle, sheep/goats and pigs according to gross value of production. This split recognises the very significant national socio-economic consequences of diseases such as FMD.

   Disease response costs include salaries and wages of those involved in the response, operating expenses, capital costs and compensation for affected producers. These costs can be huge. The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) estimated in 2013 that just the control of an FMD incursion could cost between $60m (for a small outbreak) and $373m (for a large multi-state outbreak).[8]

2. **The cost of the trade impact**. An EAD outbreak, depending on the nature of the disease agent, could result in trade restrictions on livestock produce and a subsequent loss in export earnings. An outbreak of FMD would result in trade restrictions on livestock produce, with domestic oversupply also resulting in depressed prices for perishable products such as meat. The magnitude of this cost is very difficult to judge, as it depends very much on the response of trading partners and many other factors. In the ABARES study, the present value of revenue loss only from an outbreak of FMD, across all industries over ten years, was estimated at between $5.6b and $51.8b. The revenue loss to the wool industry was $2.2b in all scenarios.

8 ABARES, 'Potential socio-economic impacts of an outbreak of foot-and-mouth disease in Australia', October 2013

9 By way of comparison, greasy wool from the UK was excluded from China for 18 months during and after the UK's 2001 FMD outbreak (John Lambert, personal communication)

10 SED Consulting, 'Exotic Animal Disease Preparedness in the Wool Industry', Final report for FAWO, May 2012

11 www.ovk.co.za/Articles/Article/2391/Press-Release-by-Cape-Wools

12 WIA EAD WG estimate

This assumed exports of 44% of baseline in year 1, 96% in year 2 and 100% thereafter.[9] The revenue losses were relatively low for wool compared with other commodities such as meat and dairy. The value of wool industry production has increased since 2013 from approximately $2.6b to an expected value of almost $4b in 2019.[10] The economic loss (in absolute terms) would therefore be higher now than was estimated by ABARES.

Wool has the advantage over other commodities of being non-perishable and therefore able to be stockpiled. Notwithstanding this advantage, the wool industry's strong export orientation places it at significant risk should Australia face an outbreak of an EAD that might be transmitted by wool. Importing countries would immediately place a ban on imports of Australian wool and this ban would remain in place until each country's authorities were satisfied that the wool posed no threat to national biosecurity. National judgements of biosecurity threats are not always entirely founded in science but, in any case, will err on the side of caution. An example of trade resumption negotiations is provided by the recent imposition and subsequent lifting of a ban on imports of cloven-hoofed animals and their products, including wool, from South Africa by China.[11]

At the level of the global industry, the short-term depletion of the pipeline could be very damaging, particularly if some later-stage players for whom wool is optional move to other fibres.

Exporting scoured rather than greasy wool is one option to ensure wool poses no threat of disease transmission. However, there are currently only three wool scours in Australia, after many moved offshore during the last ten years. Total Australian scouring capacity is now estimated at around 15mkg.[12] This represents only around 5% of Australia's annual production of 300mkg greasy wool, nowhere near enough to meet demand in a timely way.

Both the disease response and trade costs include potentially massive social and environmental impacts which are not adequately captured in simple dollar figures.

For the wool industry, the major EAD risks are considered to be FMD, sheep and goat pox, bluetongue and screwworm fly, but there are many

3. GOAL

others beside these – including Rift Valley fever (RVF), which prevented greasy wool exports from South Africa to China for 12 months in 2010-11. Anthrax is also an important EAD for wool. Although it is endemic to Australia and around the world, it occurs only sporadically, and its potential to cause disease in humans ('woolsorter's disease') makes it a disease of interest to the industry. New diseases also emerge from time to time.[13]

It is clear that effective EAD prevention, speedy response to an outbreak should it occur, and well-planned trade continuity measures are critical for the Australian (and indeed the global) wool industry. Central to these measures is 'biosecurity'. The IGAB defines 'biosecurity' as 'the management of risks to the economy, the environment and the community from pests and diseases entering, emerging, establishing or spreading'.[14] Biosecurity is thus a broad concept. It can be considered to include activities related to the resumption of trade in the event of an EAD because such activities rely upon, and must contribute to, high standards of biosecurity.

The wool industry has strong incentives to participate actively in efforts to improve national EAD preparedness. Aside from the obvious economic self-interest of doing so, the industry has obligations under the EADRA.

This Strategy aims to ensure that the wool industry has in place all of the components of an effective EAD response as are reasonably possible. Just as importantly, it aims to establish in the industry the systems and culture that will ensure EAD preparedness is subject to an approach of continuous improvement.

The goal of this Strategy is to further improve the level of EAD preparedness of the Australian wool industry by putting in place innovations that will, in the case of an EAD incursion:

- Maximise the time-and cost-effectiveness of the Government/industry response;
- Minimise reputational damage to the Australian wool industry;
- Minimise disruption to flows of Australian wool to the world's markets; and/or
- Achieve the most rapid possible return to normal business for wool growers, customers and other participants in the wool industry pipeline.

Specifically, this Strategy seeks to deliver *'20% improved capacity of post-farmgate wool industry preparedness for an Emergency Animal Disease'.*

This key performance indicator (KPI) is a commitment of the AWI Strategic Plan 2019/20 – 2021/22. Another KPI of the AWI Strategic Plan relevant to this Strategy is *'Evidence of successful development of wool bale biosecurity tools'.*

13 For example, in 2011 a new virus, named Schmallenberg virus, was identified as a cause of foetal malformations and other signs in sheep, goats and cattle in Europe

14 www.coag.gov.au/content/intergovernmental-agreement-biosecurity

4. STRATEGY DEVELOPMENT AND CONTEXT

This Strategy has been developed by Wool Industries Australia Inc. (WIA), specifically WIA's Emergency Animal Disease Working Group (EAD WG), with the assistance of AWI.

This Strategy is the third in a series of three-year plans. The first was developed following an extensive environmental scan and consultation process, including discussions with UK and South African wool industry participants with experience of EADs (FMD, RVF and others). The development of the second strategy was largely a desktop exercise, resulting in incremental rather than wholesale change to the structure and priorities.

The preparation of this Strategy (2019/20 – 2021/22) has involved a detailed review of the previous Strategy by members of the WIA EAD WG and consultations with a number of expert external reviewers, including past and present CVOs. In the case of an EAD incursion, the relevant jurisdictional CVO(s) would be responsible for overseeing the disease response. CVOs are therefore key 'customers' of any outcomes of this Strategy.

The content of this Strategy has been informed by several associated plans and key operational documents (Figure 3). These plans and documents are briefly described in Table 1 (further information on the EADRA and AUSVETPLAN is provided in section 2.3).

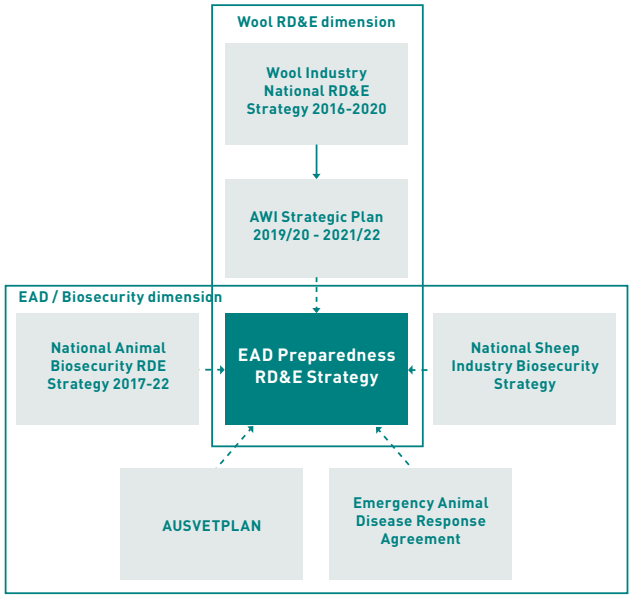


Figure 3. Plans and other key documents informing this Strategy.

Table 1. Other plans relevant to this Strategy

PLAN	RELEVANT ELEMENT(S)
AWI Strategic Plan 2019/2020 – 2021/22	• The 'parent' plan for this Strategy • Sheep Production, Science & Technology Strategies, Strategy: Healthy Productive Sheep, Program: Sheep Health & Welfare. 'The wool industry has made significant progress towards greater EAD preparedness… Pilot projects in improving post-farmgate capacity will be broadened and tested in the coming strategic period'. • Traceability Strategies, Strategy: Supply Chain Initiatives (links to Program 1 of this Strategy). 'Foster an environment of innovation in the Australian wool industry by…preparing the industry for constant and inevitable change including the downstream consumer demands of provenance and traceability'.
Wool Industry National RD&E Strategy 2018-2022*	• Program 4: Manage Risks, Exploit Opportunities. 'Activities under this strategy seek to reduce the chance of occurrence, or mitigate any impacts that do eventuate, in relation to key industry risks. Priorities for industry-level risk management are in the areas of animal welfare, climate change and variability, and emergency and endemic animal disease'. • KPIs: 'By 2022… Investments in biosecurity research and diagnostic capacity are maintained at a level sufficient to allow industry to respond as required under the Emergency Animal Disease Response Plan'.
National Sheep Industry Biosecurity Strategy	• A plan developed by WPA and Sheep Producers Australia with the vision 'Market access and productivity is protected and improved through a unified, accountable and progressive biosecurity framework that has high integrity and is understood, valued and driven by all sheep industry participants'. • On-farm in focus, but overlaps with this Strategy in areas such as response planning and capability development.
National Animal Biosecurity RD&E Strategy 2017-22 (NABRDES)*	• A cross-industry plan for biosecurity RD&E. • No direct links to this Strategy.

*Note: The Wool Industry and Animal Biosecurity RD&E Strategies are part of the National Primary Industries RD&E Framework, developed jointly between the Commonwealth, the States and Northern Territory, Rural R&D Corporations, CSIRO, and universities. The Framework was established to increase coordination and collaboration between the key players in primary industries RD&E funding and delivery. It is overseen by the Research & Innovation Committee of Agricultural Senior Officials Committee (AGSOC), part of the Council of Australian Governments (COAG) architecture. [15]

15 www.npirdef.org/framework-about

5. ACHIEVEMENTS UNDER THE PREVIOUS STRATEGIES

Significant progress has been made in strengthening the wool industry's post-farmgate EAD preparedness over the six years since the first Strategy came into effect.

Achievements include:

- Advances in wool identification and traceability, including a study of the traceability of wool through the pipeline that identified a number of areas for improvement that are progressively being implemented – for example, the inclusion of the Property Identification Code (PIC) in all wool-associated documentation.
- Developments in bale identification and tracking using radio frequency identification (RFID, by the Australian Wool Exchange (AWEX)) and Bluetooth (AWI) technologies.
- The development of a bale disinfection device, suitable for application in wool stores, including establishing the requirements for complete wetting of the bale, understanding the effects of the application of citric acid solution on quality parameters of baled wool and preparing detailed engineers' drawings for commercial production of the device.
- Confirmation through the OIE Ad Hoc Committee on FMD that a time/temperature relationship for deactivation of FMD virus based on a best-fit interpolation of available data points would form an acceptable basis to managing time-based deactivation of virus in wool, negating the need for further (very difficult and expensive) basic research in this area.

Digibale bluetooth beacons used to monitor temperature and humidity of the wool in wool bales during transport (Source: Department of Jobs, Precincts and Regions).

- Completion of content for several of the AUSVETPLAN manuals to ensure they carry the most up-to-date information on wool and the wool industry. This has included the de novo development of a Wool Enterprise Manual and revised content for relevant disease (FMD, RVF, scrapie, anthrax, bluetongue, sheep pox and peste des petits ruminants) and decontamination manuals.
- Development of a half-day EAD awareness workshop for wool store staff, piloted at three locations in NSW and Victoria with 21 staff from six businesses, and of a costed plan to deliver the training nationally.
- Creation of an online biosecurity risk assessment tool and template EAD preparedness plan and guide for wool businesses.

An EAD Preparedness Plan template and associated guidance document has been made available to post-farm wool handling facilities to enable them to consider the likely impacts of an EAD outbreak on their business, and the steps that may be put in place to minimise these impacts. The completed plan works as a 'go to' reference document for the business should an EAD outbreak occur (www.wool.com/biosecurity)

- A range of relationship-building activities, both within Australia (with governments, AHA, CSIRO etc) and internationally through the OIE and the International Wool Textile Organization (IWTO). The wool industry's proactive position on EADs is well recognised and WIA, formerly The Federation of Australian Wool Organisations (FAWO), was the recipient of an Australian Biosecurity Award in 2014.

However, not all of the priorities identified to date have been completely delivered. The main gaps are in respect to capacity development among industry personnel and communications along the pipeline, including customers. Development of a system to record the accumulated heat*time units experienced by wool in storage or transfer, sufficient to demonstrate deactivation of disease agents, is in progress but incomplete at the time of preparation of this strategy.

6. GAP ANALYSIS

For the vision of this Strategy to be achieved – that is, for the Australian wool trade to be resumed as rapidly as possible following the outbreak of an EAD – the following effective elements need to be in place:

1. Active disease **surveillance,** so that EADs are identified early;
2. An effective **governance framework** for responding to an EAD detection, well tested during 'peacetime';
3. An **operational disease response framework,** based upon sound scientific knowledge, validated and strongly linked to international (OIE) standards and also well tested;
4. **Structures and systems** to guide activities directed at restoring trade, including provisions for partitioning affected from unaffected areas (zoning) and certifying product safety;
5. The **technologies and materials** required to mount the response and recovery, including diagnostic tests, vaccines, disinfectants and so on;
6. **Financial and human capacity** to mount the activities required, including oversight, disease detection and response, trade negotiations; and
7. **Strong and well-coordinated communications** between industries, governments and trading partners.

An analysis of strengths, weaknesses, opportunities and threats (SWOT), in respect to the elements described above, was undertaken from a wool industry perspective (See Figure 4). Key findings of the SWOT are as follows:

- Australia generally, and the wool industry specifically, is reasonably well placed to respond to an EAD outbreak but there are gaps in our preparedness. And whilst Australia has dealt with equine influenza and other outbreaks, neither the nation nor the wool industry has direct experience in dealing with a major EAD in the grazing livestock industries.
- The gaps in the industry's preparedness require a range of responses from the conduct of R&D to the revision of response plans, the establishment of cross-sectoral structures and the conduct of training and extension activities. 'Stress-testing' parts of the response system is also needed given the lack of 'combat experience'.
- Addressing the gaps identified will require the contribution and participation of numerous parties, including wool industry individuals, companies and organisations; government; overseas trading partners; and other bodies such as the OIE. AWI, WPA and WIA will play critical roles in catalysing the activities undertaken as part of this Strategy.

STRENGTHS	WEAKNESSES
• Well-established and tested national EAD response plans and structures • Established, cooperative industry bodies, all contributing to EAD preparedness • Strong relationships between the wool industry and AHA, Department of Agriculture and other key stakeholders • Strong relationships with overseas customers • Over 50% of China's wool imports coming from Australia • Some (limited) national experience within EADs (notably equine influenza and Newcastle disease) • New knowledge and tools arising from the previous Strategy (e.g. wool traceability, updated AUSVETPLAN manuals, bale disinfection) • Major collaborative project, 'FMD Ready', in progress since 2016, expected to produce outcomes complementary to those from this Strategy	• Heavy reliance on China - destination for over 75% of Australian wool exports • Declining State government resourcing of EAD preparedness • Ongoing gaps in communications between government agencies and the industry on EAD-related matters • Infrequent, expensive national preparedness simulation exercises • Gaps in EAD response plans with respect to wool, especially in respect to survival of disease agents in wool bales • Little if any EAD-related business continuity planning by wool industry enterprises • Some gaps in wool tracing systems • Limited capacity to process wool on-shore • No demonstrated national experience of successfully mounting a 'zoned' response to a major grazing livestock EAD • Declining private veterinary sector involvement in farm animals
OPPORTUNITIES	**THREATS**
• Department of Agriculture interest in EAD preparedness, particularly FMD, and receptiveness to working with industry • Growing understanding among industry players of the importance and practice of good biosecurity, recently reinforced by African swine fever outbreak in Asia • Work being undertaken in other wool producing countries (virus survival etc) – opportunity to leverage Australian efforts • Recent publication of revised National Animal Biosecurity R,D&E Strategy • Revision of EAD response plans with industry input to address gaps • Strengthening of EAD preparedness / communication structures involving industry, government and trading partners • Lessons learned from other wool-exporting countries, notably South Africa's experiences with FMD • Introduction of mandatory electronic identification of sheep in Victoria increasing preparedness and raising awareness of biosecurity • Rationalisation of industry companies (exporters and brokers) in recent years simplifies communication and training of industry personnel regarding EAD preparedness' • High level of interest of the China-Australia Joint Working Group in EAD preparedness	• Biosecurity seen as a low risk and therefore not a high priority by industry players • Loss of corporate knowledge • Potential declines in resources (levy and other) to address gaps in EAD preparedness • Occurrence of an EAD before critical gaps can be addressed • Lack of capability to address identified gaps • Speed of media / communications, allowing overseas customers to find out about EADs and related developments in Australia as quickly as local industry participants

Figure 4. Strengths, weaknesses, opportunities and threats in respect to the Australian wool trade ability of one resume, as rapidly as possible, following an EAD outbreak.

7. THE STRATEGY: PROTECTING THE AUSTRALIAN WOOL PIPELINE - POST-FARMGATE EMERGENCY ANIMAL DISEASE PREPAREDNESS RD&E STRATEGY 2019/20 – 2021/22

7.1. OVERVIEW

The Australian Wool Industry Post-Farmgate Emergency Animal Disease Preparedness RD&E Strategy 2019/20 – 2021/22 (Protecting the Australian Wool Pipeline) is summarised in Figure 5 below.

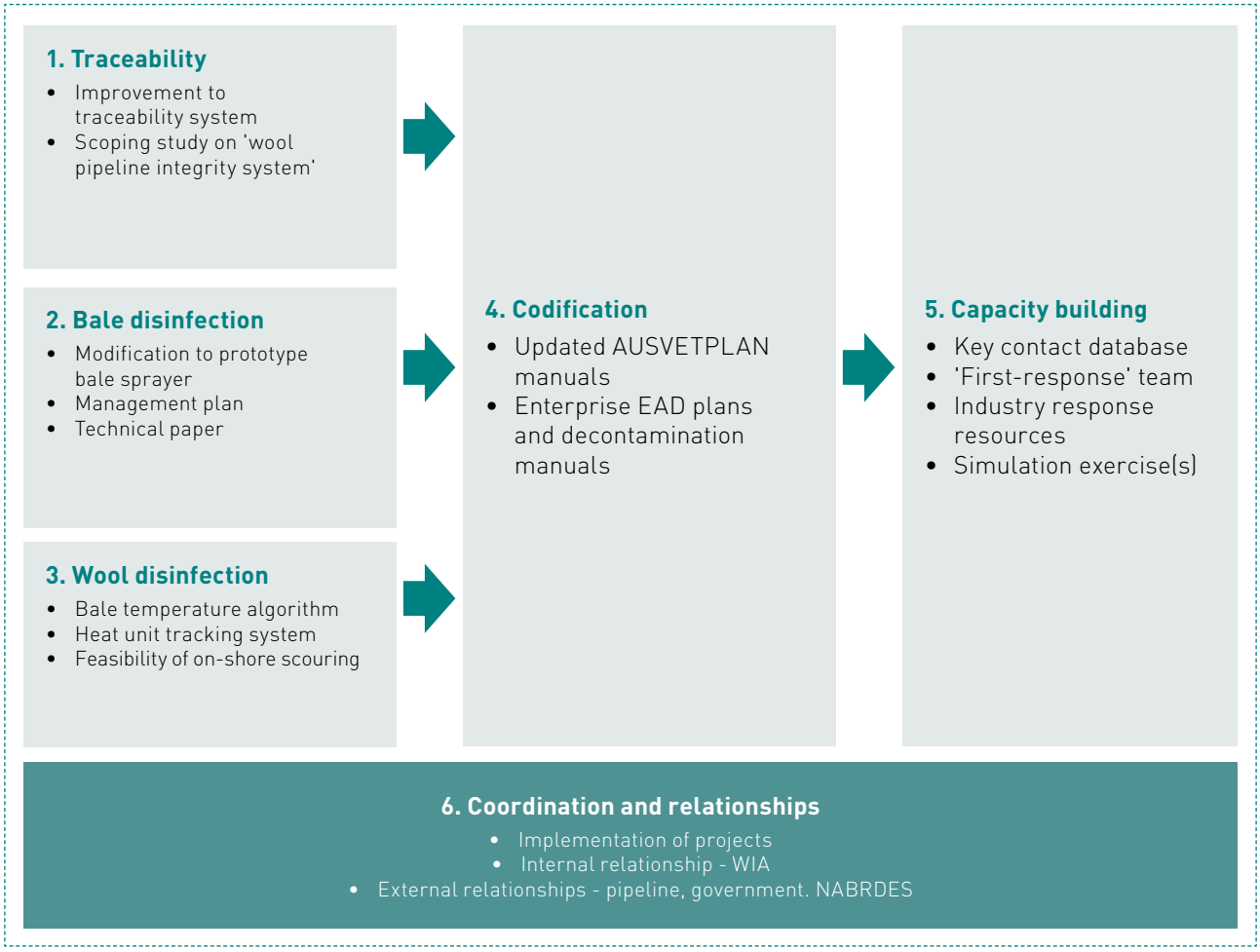


Figure 5. Overview of Australian Wool Industry Post-Farmgate Emergency Animal Disease Preparedness RD&E Strategy 2019/2020-2021/22

Details of the individual programs are described below.

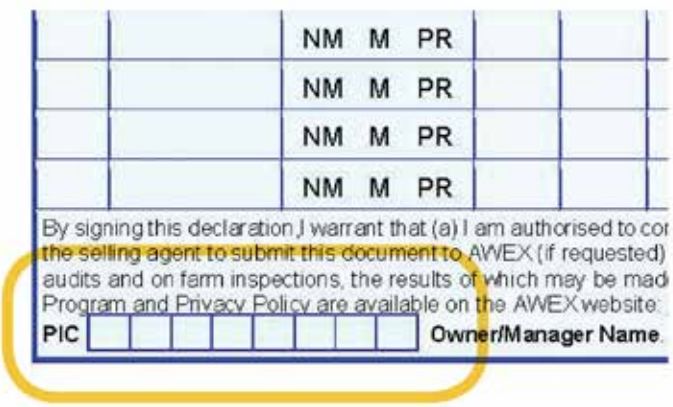
7.2 PROGRAM 1: TRACEABILITY

Rationale

A project completed under the first Strategy demonstrated that wool can generally be traced forward from property of origin with a high degree of accuracy. Tracing protocols and a spreadsheet tool are now available to assist tracing and the process has been stress-tested to a limited degree. The Property Identification Code, which is the lynchpin of the National Livestock Identification System (NLIS) and will be central to any EAD control program, can now be recorded and transmitted with wool along the pipeline.

Whilst wool traceability is generally robust, CVOs and other key response personnel would not be aware of this fact, as the wool tracing 'system' does not have a single, trusted 'framework' as NLIS does for livestock. A priority for this triennium is to gauge the feasibility of developing an NLIS-equivalent system for wool. Such a system would draw together existing structures and processes rather than being a new construction.

The imperative to improve traceability is strengthened by increasing global demand by consumers for information on the provenance of products they buy. This applies as much to wool as any other product, as recognised in the AWI Strategic Plan 2019/2020 – 2021/22.



Woolgrowers are encouraged to include their Property Identification Code (PIC) on their National Wool Declarations – this will be vital information in an EAD event

Priorities

The priorities over the life of this Strategy will be to:

- Complete recommended modifications to the traceability system, including the ability to capture and track PICs through the wool supply chain.
- Undertake a scoping study on the development of a 'wool pipeline integrity system' comparable to the NLIS. Subject to the findings of the scoping study, develop a detailed business plan for the system.

7.3 PROGRAM 2: BALE DISINFECTION

Rationale

Under the previous Strategies, a functioning device to enable high-throughput disinfection of the outside of wool bales with a citric acid solution was developed by AWTA with AWI funding. Market research on how the device would be deployed in the case of an EAD outbreak was also undertaken. This research established that owners of wool stores would not purchase the device in 'peacetime' but would prefer to have devices made available as required.

It will be important to have the existence and capabilities of the 'bale sprayer' described in a credible technical paper to provide confidence to decisionmakers, notably CVOs, that the unit is a valid tool for use in the case of an EAD outbreak.

The wool bale sprayer in action during a field trial (Source: AWTA)

Priorities

The priorities over the life of this Strategy will be to:

- Make final recommended modifications to the prototype bale sprayer.
- Develop a plan for the manufacture, storage, maintenance and mobilisation (as required) of the bale sprayer.
- Publish a credible technical paper documenting the capabilities of the bale sprayer.

16 McColl et al, 1995, 'The persistence of foot-and-mouth disease virus on wool', Australian Veterinary Journal, 72(8): 286-92

7.4 PROGRAM 3: WOOL DISINFECTION

Rationale

The top priority for the wool industry during an EAD outbreak will be to convince trading partners that Australian wool poses them no biosecurity threat. This means demonstrating that any given lot of wool has an almost-zero risk of carrying the disease agent in question.

The interior of a wool bale offers a protective environment for disease agents that may be present. A major determinant of agent survival time in a wool bale is temperature. The sensitivity of various viruses, especially FMD virus, to heat is generally well described although there is only a single study, with three data points, describing the relationship between wool temperature, time and the survival of FMDV in that wool.[16] These three time/temperature combinations are specified by the OIE standards for FMDV deactivation in wool.

Until recently, there has been little information available on the temperatures reached at various points inside wool bales stored under a range of conditions. This knowledge is needed to establish the relationship between bale storage conditions and deactivation of any FMDV that may be present. A project completed during the last Strategy has provided a preliminary model to predict internal bale temperatures but this needs refinement.

There remains a question as to whether on-shore wool scouring could comprise at least part of a wool industry EAD response. This may need to be assessed through a feasibility study that considers, in particular, throughput capacity, required biosecurity measures and market acceptance.

Priorities

The priorities over the life of this Strategy will be to:

- Finalise work on temperature gradients within bales and their relationship to ambient temperatures.
- Develop a system for demonstrating and assessing the accumulated heat*time units experienced by wool in storage or transfer sufficient to demonstrate deactivation of disease agents.
- Seek endorsement, from Australian and international authorities, for any recommendations or system arising from the 'time*temperature' work, and modify AUSVETPLAN and other documents accordingly (see Program 4).

The online Biosecurity Risk Assessment tool helps wool enterprises such as wool stores to identify biosecurity weaknesses (www.wool.com/biosecurity)

- Undertake a feasibility study of the potential for on-shore wool scouring to be part of the wool industry's response to an EAD outbreak.

7.5 PROGRAM 4: CODIFICATION

Rationale

It is critical that any improvement in the wool industry's capacity to respond to an EAD outbreak is captured in documentation that can be readily accessed and applied when an outbreak occurs.

The Australian system for responding to emergency animal diseases is called AUSVETPLAN. AUSVETPLAN is 'a comprehensive series of manuals that sets out the various roles, responsibilities and policy guidelines for agencies and organisations involved in an EAD response'.[17] These manuals are of various types: including 'disease strategies' (how specific diseases will be dealt with) and 'enterprise manuals' (how specific enterprises such as saleyards should deal with an EAD). AUSVETPLAN manuals are subject to a process of constant review and updating as new information comes to hand.

A significant body of work was completed during the life of the previous Strategy to update several AUSVETPLAN manuals. These updates are still going through the official approval process.

Program 4 will ensure that AUSVETPLAN manuals with relevance to the wool industry are kept updated with the best available information, including that arising from activities undertaken under this Strategy. WPA, as the wool industry member of AHA, will be the primary point of contact for these reviews and will seek WIA EAD WG input as required.

17 www.animalhealthaustralia.com.au/programs/emergency- animal-disease-preparedness/ausvetplan/

Priorities

The priorities over the life of this Strategy will be to:

- Through WPA, provide wool industry input to relevant AUSVETPLAN documents as they are reviewed and updated.
- Seek specific changes to AUSVETPLAN documents as outcomes from this Strategy are generated.

An EAD awareness training workshop being piloted to post-farmgate businesses

7.6 PROGRAM 5: CAPACITY BUILDING

Rationale

While Programs 1-4 ensure 'hard' systems are in place to facilitate the wool industry's response to an EAD outbreak, these systems will not be effective if the people involved in implementing them do not have the understanding, capacity or relationships to do so effectively. Program 5 will help to address these important aspects of EAD preparedness in the industry.

During the last Strategy, a half-day EAD awareness workshop for wool store staff was developed and piloted. The pilot was successful but highlighted the significant challenges faced in raising and maintaining awareness of EADs across a significant portion of the industry. An alternative approach has been suggested by which a small 'first-response' team would be established.

Program 5 also notes the desirability of conducting at least one simulation exercise to test the industry's post-farmgate EAD preparedness.

The priorities under Program 5 must be progressed in alignment with those activities occurring at farmgate level and should be driven primarily through WPA.

Priorities

The priorities over the life of this Strategy will be to:

- Develop an industry human resource plan for EAD responses.
- Develop a database of key positions and personnel throughout the pipeline, in Australia and overseas, particularly in key markets (China).
- Assess the benefit/cost of establishing a small wool industry EAD 'first-response' team, from across the industry, which is trained and regularly updated in EAD preparedness and would play a key role in industry liaison in the event of an EAD outbreak affecting wool. Progress the concept if it proves attractive.
- Develop industry response resources to complement and simplify the AUSVETPLAN documents for industry personnel, including electronic (e.g. web sites, videos) and hard-copy (e.g. posters) resources that could be mobilised in the event of an EAD outbreak throughout the industry. These resources might help individuals (e.g. brokers' staff) to understand, inter alia:
  - The likely course of the outbreak;
  - The ramifications for their workplace;
  - Their roles and responsibilities during the response;
  - Where to go for further information; and
  - How to manage customers and other stakeholders.
- Undertake at least one simulation exercise to test the industry's response capability.

7.7 PROGRAM 6: COORDINATION AND RELATIONSHIPS

Rationale

The activities of this Strategy will require coordination and management. It is also vitally important that key decision makers along the wool pipeline, and those of the Australian EAD response framework, are aware of and have confidence in the work being undertaken through this Strategy.

In particular, the Strategy recognises the central importance of jurisdictional CVOs and Commonwealth government trade officials to the industry goal of a rapid resumption of trade following an EAD event.

The Strategy also recognises the value of working with Chinese wool industry colleagues on EAD preparedness.

Priorities

The priorities over the life of this Strategy will be to:

- Effectively and efficiently implement projects to deliver on Programs 1-5.
- Develop and implement a targeted program to raise understanding of wool industry EAD preparedness among Animal Health Committee (which includes the CVOs) and government trade officials.
- Facilitating the dissemination of new information and standards through the appropriate channels, e.g. OIE, IWTO.
- Ensure EAD preparedness is a regular item for discussion by the China-Australia Joint Working Group, including the provision of updates on the Australian industry's progress under this Strategy.
- Maintain strong relationships between WIA members, IWTO, AHA and other stakeholders in relation to wool industry EAD preparedness.

8. BUDGET

AWI will provide funding for management and coordination of activities under the Strategy, and for individual projects on a case-by-case basis. Other WIA member organisations will continue to contribute cash and in-kind contributions to the achievement of Strategy priorities. Leverage of industry funds will be sought where possible.

Wool industry contributions to AHA, managed by WPA, will also support industry EAD preparedness. These funds will primarily be directed towards on-farm, disease-response activities but there are common elements between these and activities under this Strategy, especially in Programs 4, 5 and 6.

9. ROLES AND RESPONSIBILITIES

The implementation of this Strategy will be overseen by the WIA EAD WG, the terms of reference for which is provided in Appendix 1. Progress will also be reported to the Steering Committee of the Wool Industry Strategy, especially where there are collaborative investments between agencies in projects under this Strategy.

Key organisations with a role to play in the delivery of this Strategy are as follows:

- AWI is the wool industry's R&D body. AWI will take primary responsibility for the development, oversight and funding of projects to address the priorities of this Strategy.
- WPA is recognised as the wool industry signatory representative body in the EADRA between the Commonwealth Government, State and Territory Governments and livestock industries. As such, it has specific legal rights and responsibilities with respect to collective EAD preparedness and response including participation in the National Management Group, the highest level of governance in an EAD response. WPA is also the wool industry member of Animal Health Australia. In this role it holds levies on behalf of Australian wool growers for investment in health, welfare and biosecurity activities through AHA. WPA is a member of WIA and a participant in the WIA EAD WG. WPA will have responsibility to ensure that the activities of this Strategy are consistent with its other EAD preparedness plans and activities.
- Other WIA Members, namely:
  - Australian Council of Wool Exporters & Processors Inc;
  - The National Council of Wool Selling Brokers of Australia Inc;
  - Australian Wool Testing Authority Ltd;
  - Australian Wool Exchange Ltd; and
  - AWH Pty Ltd

  will have responsibility for ensuring that this Strategy addresses the main gaps in their EAD preparedness and to participate in or assist with projects as required. WIA members will also ensure the engagement of IWTO and its member bodies. IWTO and OIE maintain a memorandum of understanding that includes a commitment by the parties to keep each other informed in matters of mutual interest including biosecurity.
- The Commonwealth Department of Agriculture, State and Territory Departments of Agriculture and AHA will all play an important role in advising on the acceptability and practicality of implementing Strategy outcomes in real-world EAD outbreak scenarios. This will take place through the WIA EAD WG as well as other specific project-based interactions.

10. MONITORING AND EVALUATION

Progress against this Strategy will be monitored by the WIA EAD WG through updates presented by the AWI Program Manager Sheep Health and Welfare and other personnel responsible for the delivery of the various priorities of the Strategy.

As noted in section 3, the KPI for this Strategy is *'20% improved capacity of post-farmgate wool industry preparedness for an Emergency Animal Disease'.*

This KPI is drawn from the AWI Strategic Plan 2019/20 – 2021/22. The following methodology has been developed to estimate the industry's *'capacity'* to respond to an EAD event.

'Capacity' is defined in terms of four elements. Estimates are made of readiness under each of these elements and the scores combined in an index. The four elements are not equally weighted, as some are considered to play a more important role than others.

The elements of the capacity index are:

1. Scientific knowledge, including time required to disinfect wool, disinfectants for various pathogens etc.
2. Infrastructure, including traceability systems, bale disinfection device, plans, documents such as AUSVETPLAN.
3. Skills, knowledge and preparedness of industry personnel, including understanding of the impacts of an EAD event and principles of biosecurity, implications of an EAD event for wool businesses, some basic level of preparedness. This includes industry bodies having resources and tools ready to mobilise as needed.
4. Relationships, including with customers and key personnel in Australia in the event of an EAD outbreak (especially State/Territory and Commonwealth CVOs and government trade officials) – to build their trust in industry personnel, as well as in industry systems and capacity to provide demonstrably safe product in the face of an EAD outbreak.

A baseline estimation of the capacity parameter will be made at the commencement of this Strategy by the EAD WG with expert external input. The parameter will then be re-assessed annually by the EAD WG and external experts to monitor progress against the KPI.

Whilst subjective, the parameter estimates will be made by a group of people best informed to make such a judgment. In the absence of objective measures, movements in the capacity parameter should provide the most plausible and defensible demonstration of progress (or otherwise) against the Strategy.

Another KPI of the AWI Strategic Plan 2019/20 – 2021/22 relevant to this Strategy is *'Evidence of successful development of wool bale biosecurity tools'.*

Performance against this KPI will be assessed by identifying the delivery of specific *'tools'* (systems, hardware, software, procedures and so on – effectively, element 2 of the capacity index) through the process described above.

11. RISK MANAGEMENT

Table 2 shows the key risks to the success of this Strategy and the measures that will be taken to neutralise them as far as possible.

Table 2. Risks to the Strategy and steps taken to minimise them

RISK	RESPONSE
Failure to meet Strategy KPIs	• Explicit consideration of any potential RD&E activity for contribution to KPI achievement • Annual review of Strategy progress by the EAD WG against the KPI and adjustment as required
Poor acceptance of/ or engagement with the Strategy by industry	• Scoping and design of activities in close consultation with industry – to ensure outcomes are credible • Extensive communication on the Strategy with all parts of the industry in Australia and overseas
Lack of acceptance of outcomes by authorities responsible for EAD management	• Strong engagement with State and Commonwealth authorities throughout the implementation of the Strategy to ensure Strategy outcomes will be accepted and adopted in the case of an EAD outbreak • Means for achieving this engagement include the participation of government personnel in WIA EAD Working Group meetings, and through AHA Members' Forums, with WPA as conduit
Lack of willingness of the AWI Board to provide funding for the Strategy	• Approval for the Strategy sought from the AWI Board, and any concerns addressed • Outcomes reported regularly to the Board
Duplication of RD&E	• Consultation with other woolgrowing countries prior to initiating projects (especially South Africa) • Reviews of existing literature and discussion with knowledgeable people where prior R&D may have been done

12. SUPPORTING DOCUMENTS AND REFERENCES

Animal Health Australia 2019, 'Australian Veterinary Emergency Plan [AUSVETPLAN]', Canberra.

Animal Health Australia 2018, 'Government and Livestock Industry Cost Sharing Deed in Respect of Emergency Animal Disease Responses' (contract), version no. 18, Canberra.

Animal Health Australia 2018, 'National Animal Biosecurity RD&E Strategy', draft 2017 – 2022, Canberra.

Australian Wool Innovation 2019, 'Strategic Plan 2019/20 – 2021/22', Sydney.

Australian Wool Innovation 2018, 'Wool Industry – National RD&E Strategy 2018 – 2022', Sydney.

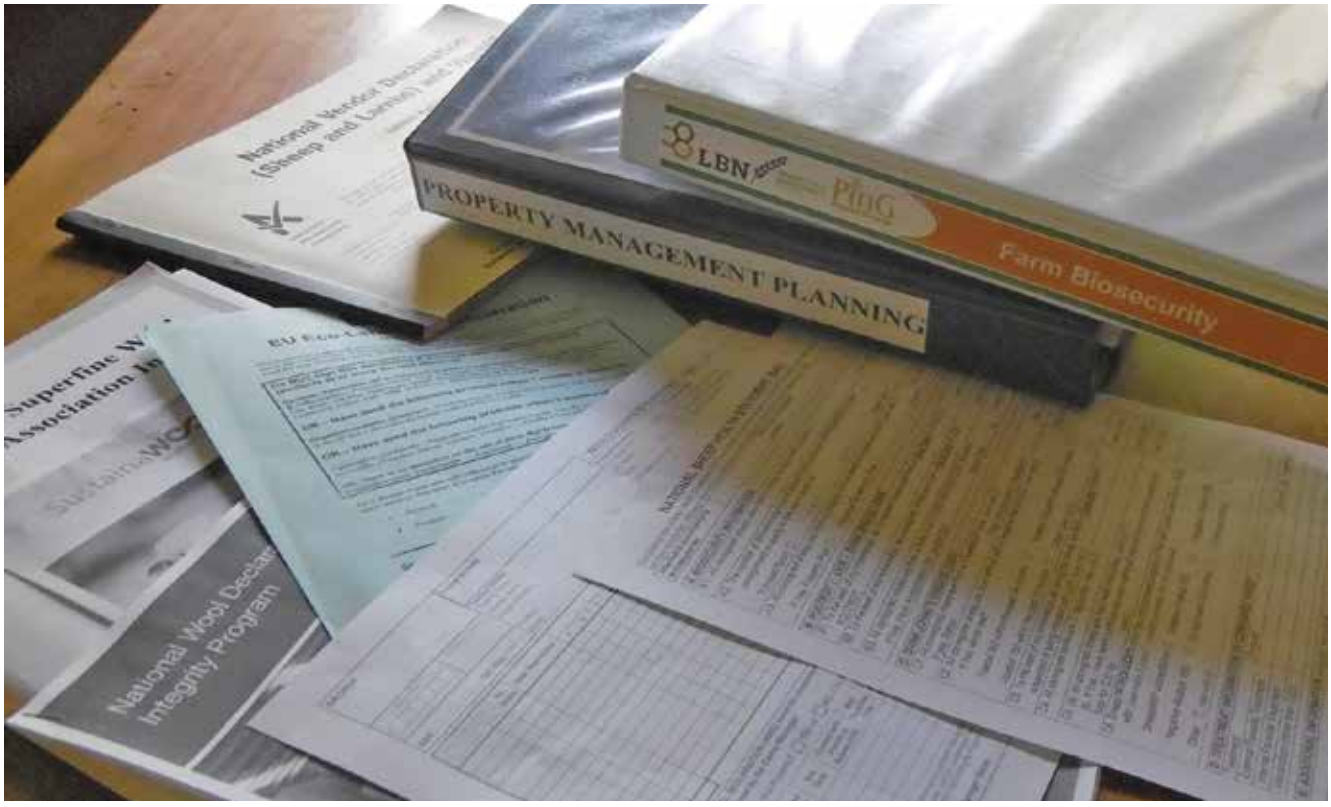
Beale, R *et al*. 2008, 'One Biosecurity: A Working Partnership. The Independent Review of Australia's Quarantine and Biosecurity Arrangements. Report to the Australian Government', Commonwealth of Australia, Canberra.

Buetre, B *et al*. 2013, 'Potential Socio- Economic Impacts of an Outbreak of Foot- and-Mouth disease in Australia', ABARES research report, Canberra.

Craik, W *et al*. 2017, 'Priorities for Australia's Biosecurity System: An Independent Review of the Capacity of the National Biosecurity System and its Underpinning Intergovernmental Agreement', Commonwealth of Australia, Canberra.

Matthews, K 2011, 'A Review of Australia's Preparedness for the Threat of Foot-and-Mouth Disease', October, Commonwealth of Australia, Canberra.

WoolProducers Australia and Sheep Producers Australia 2019, 'National Sheep Industry Biosecurity Strategy: Protecting our Future' (draft), Canberra



On-farm biosecurity paperwork (Source: Baregamerino baregamerino.com.au)

APPENDIX 1: WIA EAD WORKING GROUP TERMS OF REFERENCE

TERMS OF REFERENCE

The WIA Emergency Animal Disease Advisory Group is a forum for provision of expert advice and related services to WIA members with the goal of maximising Australia's preparedness for EAD outbreaks. Specifically, the Working Group reviews and provides expert assessment of Australia's preparedness for an EAD outbreak, focussing on;

1. Assessment and analysis of potential disruptions to wool trade flows in the event of EAD emergencies, within a variety of potential outbreak scenarios, and producing quantitative estimates of potential disruptions to industry flows;
2. Considering and recommending specific actions for improving preparedness and minimising disruptions to flow of wool to trade customers, including identifying potential sources of funding support if required, and;
3. Monitoring of progress toward maximised industry preparedness.

On an international level, the Advisory Group will liaise and meet with the IWTO Wool Trade Biosecurity Working Group to discuss issues and improve sharing of information, research, research and communication between grower countries to minimise trade risks. As the Australian National Committee of IWTO, IWTO also has observer status with OiE.

COMPOSITION

The composition of the Advisory Group shall be determined by agreement of the WIA Executive. Ordinarily, participants will be drawn from the broader membership of the WIA Executive Committee, but may be supplemented by individuals external to this Committee, as required, by agreement of the WIA Executive. Specifically, an Animal Health Australia Nominee is suggested as a Working Group member.

CONDUCT OF MEETINGS

Meetings will be chaired by the Chairman of the WIA Executive Committee or nominee, and WIA will provide secretarial support.

Minutes of the meetings will be kept, and Advisory Group decisions and action points disseminated to Group members, and provided to the WIA Executive.

The WIA Executive will be provided, on a 6-monthly basis, with a summary status report from the Chair of the Advisory Group, covering the general conduct if the Advisory Group and rating the state of industry EAD preparedness.

FREQUENCY OF MEETINGS

Meetings will be held on an as-needs basis, although expected to occur at least 6-montly.

The calling of meetings will be through the Chair of the WIA Executive Committee.

ADVISORY GROUP EXPENSES

Advisory Group members will cover their own expenses incurred in the conduct of meetings, and AWI will consider covering any expenses associated with provision of specific expert advice to the Group, upon written request.

The Australian Wool Industry Emergency Animal Disease Preparedness RD&E Strategy 2019/20-2021/22 was developed by the WIA Emergency Animal Disease Working Group, with funding from Australian Wool Innovation. WIA acknowledges the financial and in-kind contribution provided by these organisations.

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AWI invests in research, development, innovation and marketing activities along the global supply chain for Australian wool. AWI is grateful for its funding, which is primarily provided by Australian woolgrowers through a wool levy and by the Australian Government which provides a matching contribution for eligible R&D activities