National Animal Biosecurity Research, Development and Extension Strategy

animalhealth
AUSTRALIA

2023–2028

CONTENTS

EXECUTIVE SUMMARY

The National Animal Biosecurity Research, Development and Extension Strategy (NABRDES) provides an overriding framework to support collaboration and coordination between stakeholders, resulting in maximal efficiency and value from investment in primary industries research, development and extension (RD&E) resources. Robust cross-sectoral biosecurity is essential to protect Australia's livestock sector and its relative freedom from significant diseases, and accordingly to protect food security, trade, and the economy.

Biosecurity RD&E plays an important role in underpinning Australian livestock industries' productivity, growth, competitiveness, sustainability, and access to trade markets (both domestic and international). Stakeholders include the Australian Government, state and territory governments, research and development corporations (RDCs), CSIRO, universities, and private research providers. The stakeholders form a network whose collective expertise and capabilities may be utilised to address critical cross-sectoral biosecurity challenges to Australia's livestock industries. Active support and overall strategic management are required in order to ensure effective and timely collaboration, particularly in the context of emerging diseases which firstly may lie beyond the scope of current routine surveillance and response systems, and secondly which may implicate multiple sectors. The NABRDES fulfils the role of providing supportive promotion, integration and facilitation of cross-sectoral animal biosecurity RD&E.

The NABRDES is an Animal Health Australia (AHA) special project and was first published in 2014 under the National Primary Industries RD&E Framework at the request of the former Primary Industries Standing Committee (PISC; now known as the Agriculture Senior Officials Council (AGSOC)). The second version was published and endorsed by the Research and Innovation Committee on behalf of AGSOC in 2017.

Each version of the NABRDES reflects significant stakeholder consultation, as well as relevant, published RD&E priorities of, for example, the National Biosecurity Committee (NBC)[1], the Australian Government's Science and Research Priorities (from 2015)[2], the Agricultural Competitiveness White Paper (2015)[3], the review of the Intergovernmental Agreement on Biosecurity (IGAB)[4], and the strategic plans of the livestock industries. It is also aligned to the National Animal Welfare RD&E Strategy[5].

1   National Biosecurity Strategy 2022-2032

2   Engagement and Impact Assessment (2018-2019) - Science and Research Priorities

3   Agricultural Competitiveness White Paper 2015

4   Priorities for Australia's biosecurity system (IGAB 2017)

5   Animal Welfare RD&E Strategy 2017

The contribution of primary production to the national economy is very significant and warrants strenuous efforts to safeguard continued domestic and international market access. To ensure that animal biosecurity is continuously evolving and improving, RD&E must increase efficiency and be able to address shortcomings in relevant areas across sectors (e.g. prevention, identification, containment, eradication, and protection of assets in the event of disease incursions). It also needs to minimise unnecessary duplication of effort and resources, improve collaboration and leverage from existing investments. This acknowledges that the process of identifying shortcomings is incomplete until the resources and funding required to adequately address them have also been identified. Consequently, system stakeholders need to collectively agree to (i) the priorities; (ii) how they will be addressed; and (iii) how best to secure and allocate resources to them.

The NABRDES 2023-2028 has been developed with a vision in mind: *World-leading cross-sectoral biosecurity RD&E through collaboration and efficient use of resources, further improving Australia's animal health status, agricultural productivity and ongoing market access.*

The goals for the NABRDES have been split into short, medium and long-term. To meet these goals, outcomes will be delivered in four 'priority areas' which are:

- national standards
- technological solutions
- futureproofing
- investment needs

Achieving outcomes in the priority areas will be met through RD&E within seven 'tactical priorities', which are:

- collaboration
- communication
- education/ training
- pest animals/ weed in pasture management
- policy/ legislation
- surveillance
- traceability.

A key focus for NABRDES 2023-2028 will be maintaining focus on, and coordination of, biosecurity RD&E activities so that investment in common principles generates the maximal value across the overlapping priorities of Australia's animal, plant and environmental health strategies.

The NABRDES is intended to deliver effective support, promotion and integration of RD&E that addresses dynamic animal health biosecurity challenges. The activities of the Steering Committee support these aims and their implementation. NABRDES aims to: harness and leverage knowledge, skills and resources of greatest requirement from across relevant sectors; increase producer awareness of livestock biosecurity RD&E; reduce unnecessary RD&E duplication while adding value by promoting collaboration between relevant sectors; and promote greater problem-focused and solution-orientated collaboration between stakeholders.

AHA will manage the NABRDES on behalf of its members and the broader stakeholder group. A National Animal Biosecurity RD&E Coordinator will champion the NABRDES and manage its operations. The Coordinator has developed a project plan for the NABRDES in consultation with the Stakeholder Reference Group.

ACRONYMS

ABARES	Australian Bureau of Agricultural and Resource Economics
AMM	Agriculture Ministers Meeting
AGSOC	Agriculture Senior Officials Committee
AHA	Animal Health Australia
CSIRO	Commonwealth Scientific and Industrial Research Organisation
GVP	Gross value of production
IGAB	Intergovernmental Agreement on Biosecurity
NABRDES	National Animal Biosecurity Research, Development and Extension Strategy
NBC	National Biosecurity Committee
PISC	Primary Industries Standing Committee (now AGSOC)
R&D	Research and development
RD&E	Research, development and extension
RDC	Research and development corporation
R&I	Research and innovation

ACKNOWLEDGEMENTS

This Strategy has been prepared by the Stakeholder Reference Group of the National Animal Biosecurity Research, Development and Extension Strategy (NABRDES) comprised of member representation from:

Table 1. NABRDES acknowledgements

Organisation
Australian Eggs
Australian Wool Innovation
AgriFutures
Meat and Livestock Australia
Livestock Export Corporation
Australian Pork Limited
Dairy Australia
Agriculture Victoria
NSW Department of Primary Industries
QLD Department of Agriculture and Fisheries
Department of Natural Resources and Environment Tasmania
SA Department of Primary Industries and Regions
WA Department of Primary Industries and Regional Development
NT Department of Industry, Tourism and Trade
Department of Agriculture, Fisheries and Forestry
With additional support by observers from:
Animal Health Committee
Charles Sturt University
University of Adelaide
University of Queensland
University of Melbourne
CSIRO

INTRODUCTION AND BACKGROUND

Australia's livestock sector contributes $26 billion to Australia's economy via exporting livestock and livestock products. Maintaining Australia's animal health and biosecurity is therefore vital for all livestock industries. The geographical isolation of Australia has helped maintain freedom from several significant pests, weeds and diseases that would negatively impact the ability to sell livestock and their products, but this must be supported by the ongoing conduct of Research and Development (R&D) and implementation of Engagement practices to protect livestock health against a variety of shifting threats (collectively, RD&E). Given the importance of biosecurity, a significant amount of government and industry levy funding is put into biosecurity RD&E annually.

Biosecurity RD&E has an important role in underpinning productivity, growth, competitiveness and the sustainability of Australia's livestock industries and access to trade markets. Stakeholders in livestock biosecurity RD&E are a diverse group of research providers and investors. Integral stakeholders include the Australian Government, State and Territory governments, RDCs, CSIRO, universities and private research providers (collectively referred to in this document as 'participants').

This diverse groups of stakeholders needs to be highly organised and interconnected, particularly in relation to issues such as biosecurity that cross multiple sectors. Hence the relevance for an overarching strategy and one that can also serve as a two-way communication pathway with the newly developed Animalplan 2022-2027[6].

The National Animal Biosecurity Research, Development and Extension Strategy (NABRDES) is an Animal Health Australia (AHA) special project and was first published in 2014 under the National Primary Industries RD&E Framework at the request of the former Primary Industries Standing Committee (PISC, now known as Agriculture Senior Officials Council - AGSOC). The framework aims to promote greater collaboration and continuous improvement in the investment spent on primary industries' RD&E resources nationally.

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6   Animalplan 2022 to 2027: Australia's National Action Plan for Production Animal Health

ALIGNMENT TO NATIONAL STRATEGIES

The National Primary Industries RD&E Framework is implemented through 14 sectoral and 7 cross-sectoral (defined as where there are two or more stakeholders with a shared priority, investment or interest in an RD&E issue) Strategies to promote greater collaboration, coordination, efficiency and continuous improvement in the investment spent on primary industries' RD&E resources nationally.

These Strategies[7] are:

- focussed sectoral strategies: beef, cotton, dairy, fisheries and aquaculture, forestry, grains, horticulture, pork, poultry, sheep meat, sugarcane, wine, wool, and new & emerging industries.
- cross-sectoral strategies: plant biosecurity, animal welfare, biofuels and bioenergy, climate change, food and nutrition, soils, and water use in agriculture.

The NABRDES was developed to be in alignment with the National Primary Industries RD&E Framework and in addition, making sure it meets the needs of the Intergovernmental Agreement on Biosecurity 2017 (IGAB 2017)[8]. Other key strategies that are linked to NABRDES are summarised in **Table 2**. This list is current as of 01 June 2023; it will be reviewed annually and updated accordingly.

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7   Strategies (npirdef.org) accessed June 2023

8   Priorities for Australia's biosecurity system – An independent review of the capacity of the national biosecurity system and its underpinning Intergovernmental Agreement (agriculture.gov.au)

Table 2. Brief summary of national agriculture and biosecurity strategies linked to NABRDES

National agriculture and biosecurity strategies	Reason and relevant link to the NABRDES
Animalplan (2022 – 2027)	Consolidates agreed animal health activities across Australia's terrestrial animal agriculture industries; includes objective to improve adoption and implementation of biosecurity practices throughout the terrestrial animal supply chain.
Animal welfare RD&E	Animal biosecurity is strongly linked to animal welfare. Pest and disease outbreaks can negatively impact on the health and wellbeing of animals. awstrategy.net
Antimicrobial resistance	Antimicrobial resistance is of significant concern to the livestock industry. aiasrdestrategy.com.au
Australia's Biosecurity Future – Unlocking the next decade	Aligned goals of shared responsibility and innovation in science and technology. Looking to the future of Australia's biosecurity system (CSIRO)
Department of Agriculture, Fisheries and Forestry National Biosecurity Strategy	The NBS 2022-32 has 6 Priority Areas, each of which targets outcomes that align closely with the NABRDES objectives: • Stronger partnerships • Shared biosecurity culture • Sustainable investment • Highly skilled workforce • Coordinated preparedness and response • Integration supported by technology, research and data National Biosecurity Strategy (agriculture.gov.au)
Intergovernmental Agreement on Biosecurity Review (IGAB, 2017) – Priorities for Australia's Biosecurity System	• Clear national biosecurity research and innovation (R&I) priorities are needed to focus investment • Improved coordination of biosecurity R&I is needed to drive cross-sectoral research, technological developments, and behavioural change. Intergovernmental Agreement on Biosecurity Review Final Report – DAFF (agriculture.gov.au)
National Agricultural Innovation Policy Statement (2021)	Outlines the national priorities to enable growth, prosperity and sustainability of Australian agriculture through to 2030 National Agricultural Innovation Policy Statement (agriculture.gov.au)
National Environment and Community Biosecurity Extension Strategy	Some pests and diseases of livestock can impact on other species, humans and the environment and vice versa. NECBRDES 2021 - 2026 (DAFF)

Continued

National agriculture and biosecurity strategies	Reason and relevant link to the NABRDES
National Farmer's Federation 2030 Road Map – Australian Agriculture's Plan for a $100 Billion Industry	Biosecurity is identified as being of critical importance for market access, and the role of innovation and cross-sectoral R&D strategies in achieving this goal is also identified. • Australia has world-leading market access, and the capacity to maximise the economic benefits. • Reinforce the importance of domestic biosecurity • Renew and extend existing cross-sectoral R&D strategies to grow the size and impact of both public and private R&D. nff.org.au/policies/roadmap
Plant biosecurity	Livestock industries rely on the plant industry as a source of feed. planthealthaustralia.com.au
Rural R&D for Profit Program – priority areas (2015-2022)	Biosecurity priority area: To improve understanding and evidence of pest and disease pathways to help direct biosecurity resources to their best uses, minimising biosecurity threats and improving market access for primary producers. www.agriculture.gov.au/agriculture-land/farm-food-drought/innovation/rural-research-development-for-profit

Subsequent to the publication of the NABRDES 2017-2022, Animalplan 2022-2027 was developed. Animalplan is Australia's first national action plan to strengthen the national agricultural animal health system. Animalplan consolidates agreed animal health activities across Australia's terrestrial animal agriculture industries and has been developed through collaboration between governments, industry organisations, animal health experts and other stakeholders. There is still, however, no dedicated contemporary overarching animal biosecurity RD&E strategy; hence, the value and place for the NABRDES 2023-2028.

To identify and develop an animal biosecurity RD&E strategy requires extensive consultation and reliance on building on the past national strategies, audits of RD&E capacity, and careful consideration of the RD&E priorities from other sectors and jurisdictions.

The National Agricultural Innovation Policy Statement (2021)[9] replaced the National Rural RD&E Priorities that were established through the Agricultural Competitiveness White Paper (2015). The updated national priorities are, by 2030, for Australia to be a:

1. Trusted export of premium food and agricultural products
2. Champion of climate resilience to increase the productivity, profitability and sustainability of the agricultural sector
3. World leader in preventing and rapidly responding to significant pests and diseases through future-proofing our biosecurity system
4. Mature adopter, developer and export of digital agriculture.

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9   National Agricultural Innovation Policy Statement (agriculture.gov.au)

The above national priorities are encompassed specifically for animal (livestock industries) biosecurity by the NABRDES Broader Goals of achieving resilient and sustainable livestock industries, improved market access, and increased farm and supply chain profitability. The NABRDES Program Logic (see **Figure 1**) and Strategy Priorities (see **Figure 2**) provide further detail as to the Strategy's means of achieving of the national priority targets.

Exemplar paradigm

Pre-border and post-border biosecurity have traditionally been areas of great concern to multiple livestock sectors. In recent years, spread of foot-and-mouth disease and lumpy skin disease in Indonesia has presented an emergent threat to biosecurity across several Australian sectors (i.e. ruminant and pig livestock industries).

In February 2022, Japanese encephalitis was detected and confirmed in piggeries in Victoria, Queensland and New South Wales. Further cases were later detected in South Australia. While the source is unknown, the causative virus probably entered Australia via wild bird migration, with its spread facilitated by mosquito vectors.

This is an example of a recent exotic disease incursion that carried multi-sectorial implications (in this case, livestock, wildlife and human health).

With climate change and globalisation, similar threats will increase in likelihood. By promoting cross-sectoral collaboration and targeted investment, NABRDES can help facilitate optimisation of RD&E to address such threats to Australian livestock agriculture.

Definition of biosecurity

The IGAB (2017) defines biosecurity as: *"the management of risks to the economy, the environment and the community from pests and diseases entering, emerging, establishing or spreading."*

Stakeholders in the NABRDES have agreed to the use of this definition for consistency with further explanation provided in the Scope.

VISION

The vision for NABRDES (2023-2028) is:

To support world-leading cross-sectoral biosecurity RD&E through collaboration and efficient use of resources, further improving Australia's high animal health status, productivity and ongoing market access.

GOALS

The strategic goals are aligned to stakeholder goals and the broader national agriculture and animal biosecurity frameworks. The NABRDES contributes to the following **broad goals** for Australia's livestock industries:

- Resilient and sustainable Australian livestock industries.
- Public and wildlife heath are protected (from pests and diseases with livestock hosts).
- Market access is improved.
- Increased farm and supply chain profitability.

The long-term **end of program goals** are:

- National biosecurity RD&E priorities addressed.
- Efficient use of RD&E resources and capabilities.

Within this context, the **short to medium-term goals** are:

- Enhanced cooperation, collaboration and co-investment between biosecurity stakeholders.
- Greater information sharing between biosecurity stakeholders.
- Informed RD&E decisions and investments, leading to greater coordination and reduced duplication.

A summary program logic diagram of the strategy is presented in **Figure 1**. This model allows stakeholders to clearly see the Strategy's broad goals within the context of its activities and mid-term outcomes. It also enables monitoring and evaluation of the Strategy's progress.

During development of the program logic, the following assumptions were made:

- There is shared ownership by all stakeholders with a common goal for improved animal biosecurity RD&E.
- All stakeholders are engaged.
- There is integration and recognition of other RD&E strategies and national biosecurity initiatives and reforms.
- Increased knowledge improves coordination and cooperation, leading to improved efficiency.

Figure 1. The NABRDES program logic

Program Logic of National Animal Biosecurity RD&E Strategy 2023

Broader goals
- Resilient and sustainable Australian livestock industries
- Public and wildlife health protected (from disease with livestock hosts)
- Market access is improved
- Increased farm and supply chain profitability

End of program outcomes
- National biosecurity RD&E priorities adressed
- Efficient use of RD&E reseources and capability

Intermediate outcomes
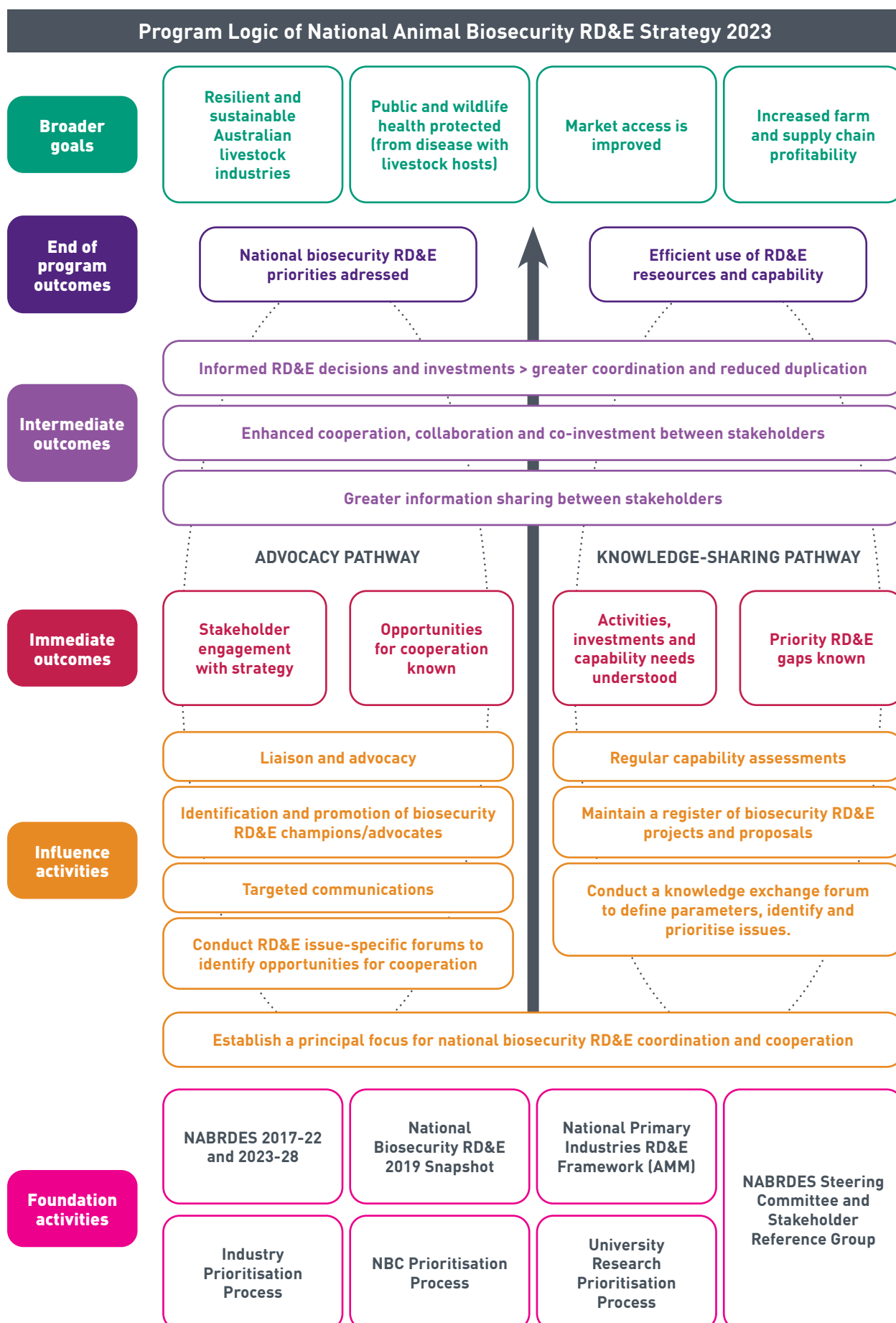- Informed RD&E decisions and investments > greater coordination and reduced duplication
- Enhanced cooperation, collaboration and co-investment between stakeholders
- Greater information sharing between stakeholders

ADVOCACY PATHWAY

KNOWLEDGE-SHARING PATHWAY

Immediate outcomes
- Stakeholder engagement with strategy
- Opportunities for cooperation known
- Activities, investments and capability needs understood
- Priority RD&E gaps known

Influence activities
- Liaison and advocacy
- Regular capability assessments
- Identification and promotion of biosecurity RD&E champions/advocates
- Maintain a register of biosecurity RD&E projects and proposals
- Targeted communications
- Conduct a knowledge exchange forum to define parameters, identify and prioritise issues.
- Conduct RD&E issue-specific forums to identify opportunities for cooperation
- Establish a principal focus for national biosecurity RD&E coordination and cooperation

Foundation activities
- NABRDES 2017-22 and 2023-28
- National Biosecurity RD&E 2019 Snapshot
- National Primary Industries RD&E Framework (AMM)
- NABRDES Steering Committee and Stakeholder Reference Group
- Industry Prioritisation Process
- NBC Prioritisation Process
- University Research Prioritisation Process

SCOPE

Broadly, NABRDES's role is to foster communication and collaboration between all animal biosecurity stakeholders, and to identify and prioritise cross-sectoral animal biosecurity RD&E activities. In turn this leads to minimisation of the potential impact(s) of exotic and endemic diseases and pests on Australia's animal industries, wider community and the environment.

The scope includes:

- Prevention, preparation and recovery from endemic, emergency and emerging animal pests and diseases relevant to livestock health, welfare and market access.
- Addressing stakeholder animal health barriers to market access, whether it be domestic or export.
- Protecting public health in relation to zoonoses and the safe, healthy production of food and fibre.
- Promoting engagement with biosecurity at a national, state, regional and enterprise (farm gate) level.
- Facilitating opportunities for cross-sectoral RD&E, with cross-sectoral defined as where there are two or more stakeholders who have a shared priority/investment/ interest in an RD&E issue. The NABRDES acknowledges the continued importance of single-sector RD&E, but the focus is on cross-sectoral investments.
- Focusing on robust extension methodologies to increase knowledge transfer to the farmer and enhance adoption outcomes.

The scope does not include:

- Companion animals (other than where there are effects on public health or market access of livestock).
- Wildlife (other than if there are effects on market access or livestock or public health).
- The funding of animal biosecurity RD&E.

SITUATIONAL ANALYSIS

The contexts in which the NABRDES operates can be defined as three areas:

1. Internal – relevant issues for Australia's animal biosecurity participants.
2. Immediate – current issues relevant to Australia's animal biosecurity participants.
3. Remote – relevant issues external to Australia's animal biosecurity participants.

Internal context

Issues:

*   Declining capability to conduct RD&E, e.g. where there is declining human resources, infrastructure and investment at all levels of government.
*   Ongoing pressure on animal industry levies and ability to maintain investment in biosecurity RD&E, in light of competing priorities.
*   Increasing demands on the already limited resources of industry representative bodies with reduced ability to contribute to policy development and review.
*   Lack of an effective cross-sectoral mechanism to initiate collaborative RD&E

Ways in which NABRDES can help address the issues:

*   Promote shared recognition of biosecurity as a top investment priority amongst stakeholders, in terms of both animal health and welfare, and its implications for market access (both domestic and international).
*   Provide opportunity for enhanced awareness of and collaboration on RD&E activities between stakeholders, reducing the demand on limited resources
*   Enable consideration of RD&E resources and maximising efficiency in use of them

Immediate context

Issues:

- Fragmentation of RD&E effort, both geographically and administratively, which dilutes national capability and wastes resources
- Declining government resources available for biosecurity RD&E
- Poor access to knowledge regarding completed and ongoing animal biosecurity RD&E.
- Lack of an agreed national animal biosecurity RD&E priority list.
- Lack of clear market incentives for improving animal biosecurity (excepting quality assurance programs, which are industry-specific)
- Increasing government support for co-regulation with industry programs and systems
- Uncertainty about availability of resources to deliver NABRDES to stakeholder expectations.

Ways in which NABRDES can address the issues:

- Encouraging RD&E to have a focus on the future, representing a shift away from the current reactive approach to biosecurity
- Enable and promote cross-sectoral collaboration
- Enable and promote knowledge exchange between stakeholders
- Attracting and earning support from stakeholders

Remote context

Issues:

- Limited RD&E focused on the impacts of climate change, including alterations to the range, habitat and spread of pests and diseases and the effect of severe weather events.
- Little RD&E addressing the potential impact(s) of international politics resulting in the international movement of biosecurity risk materials.
- A greater focus by the community on the sustainability of agriculture, particularly in relation to food production.
- Globalisation presents increase in biosecurity risk with additional movement of people, products and pests.
- Changing land use, population spread and shifting demographics expanding the interface between urban and rural areas and the natural environment. This includes the biosecurity challenges associated with increasing peri-urban smallholdings with livestock.
- Changing farming practices, including intensification and fewer generationally-owned farms.

Ways in which NABRDES can address the issues:

- Promote strong recognition of the contribution of primary production to Australia's economy, and more specifically promote the value of biosecurity RD&E in ensuring the ongoing competitiveness of primary production.
- Enable sectors to work together to leverage additional funding sources for biosecurity RD&E.

IDENTIFYING NATIONAL ANIMAL BIOSECURITY RD&E PRIORITIES

As background, the initial national animal biosecurity RD&E priority framework within the NABRDES was developed using two reference points: consideration of existing **national RD&E priorities** and existing **stakeholder priorities**. These are described in more detail below.

The framework was reviewed during the development of the 2023-2028 NABRDES and was considered to remain fit-for-purpose. The NABRDES priorities are illustrated in **Figure 2**.

1. Consideration of existing national RD&E priorities

Existing priorities may be either broad (such as the priorities of the National Agricultural Innovation Policy Statement (2021), which are related to agriculture as a whole and are outlined in Alignment to National Strategies, above) or specific to biosecurity (such as the NBC's National Biosecurity Strategy Priority Areas, presented in **Table 3**).

Table 3. National Biosecurity Strategy 2022-2032 Priority Areas, and how NABRDES aligns with them

National Biosecurity Strategy 2022-2032 Priority Areas	How NABRDES aligns with them (*via its Tactical Priorities, Priority Areas and Broader Goals*)
Shared biosecurity culture	Tactical Priorities of Collaboration and Communication. NABRDES connects animal biosecurity stakeholders (and stakeholders in related areas, as per the NPI RD&E Framework Strategies) and facilitates cross-sectoral collaboration.
Stronger partnerships	Tactical Priorities of Collaboration, Communication, and Policy/Legislation.
Highly skilled workforce	Tactical Priorities of Education/Training
Coordinated preparedness and response	Tactical Priorities of Surveillance, Collaboration, Traceability, and Pest Animal/Weed in Pasture Management; through to the NABRDES Broader Goals. NABRDES acts to build cross-sectoral collaborative relationships that hold intrinsic value in preparedness and response to biosecurity threats.
Sustainable investment	Priority Area of Investment Needs. NABRDES intrinsically acts to maximise return from investment in RD&E by promoting cross-sectoral collaboration, reducing duplication of research, and identifying areas of need.
Integration support by technology, research and data	Priority Areas of Technology and Futureproofing.

2. Existing stakeholder-defined priorities

The strategic plans of all NABRDES stakeholders (industry and government) were reviewed to identify the biosecurity RD&E priorities defined through their planning processes. Priority lists were collated and took into account areas where duplication may occur and the potential for collaboration was high, as well as gaps in biosecurity RD&E. The result was four NABRDES Priority Areas, overarching seven Tactical Priorities (**Figure 2**). The strategies of government, industry and other national priorities are continuously monitored by NABRDES members for opportunities to engage in collaboration to reduce duplication and increase efficiency of RD&E.

The Steering Committee and stakeholder organisations are provided with support from AHA to conceptualise RD&E priority activities.

Updated lists of priority activities are presented to the stakeholders for consideration and agreement as to which are only supported by one sector, and ones which are cross-sectoral (i.e. multiple sectors express an interest in an issue). This is achieved through the Knowledge-Sharing Pathway (refer to Program Logic, **Figure 1**).

Scoping and planning of RD&E outputs within the NABRDES Tactical Priorities is intended to drive outcomes in Priority Areas, through to meeting the Strategy's Broader Goals.
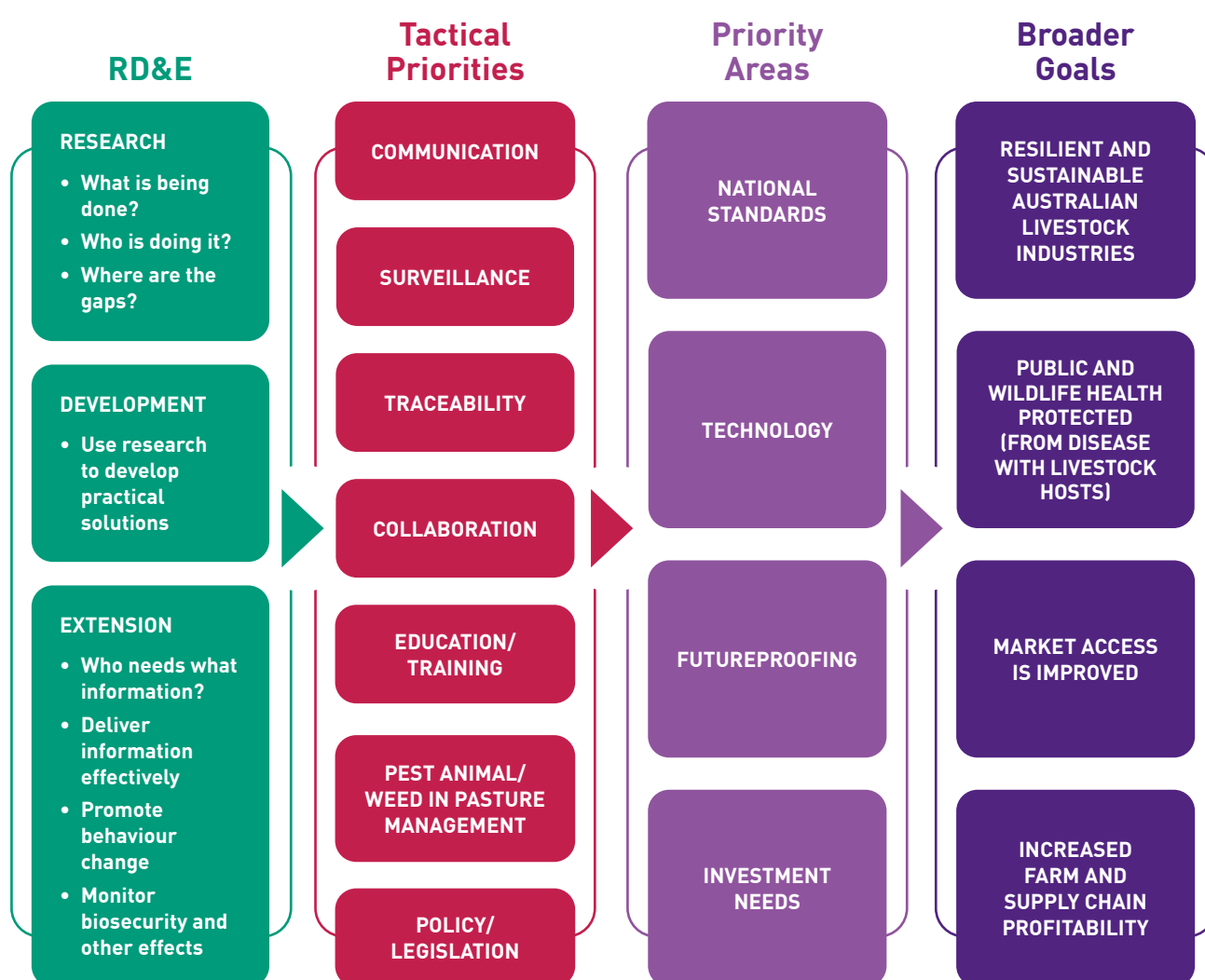
NABRDES PRIORITIES

The NABRDES aims to deliver outcomes in four Priority Areas through RD&E within seven Tactical Priorities (**Figure 2**). The four Priority Areas are:

- the development and implementation of national standards
- investigation of technological solutions
- future-proofing Australian livestock biosecurity
- identifying investment needs

Figure 2. NABRDES priorities

RD&E	Tactical Priorities	Priority Areas	Broader Goals
RESEARCH • What is being done? • Who is doing it? • Where are the gaps?	COMMUNICATION	NATIONAL STANDARDS	RESILIENT AND SUSTAINABLE AUSTRALIAN LIVESTOCK INDUSTRIES
	SURVEILLANCE		
DEVELOPMENT • Use research to develop practical solutions	TRACEABILITY	TECHNOLOGY	PUBLIC AND WILDLIFE HEALTH PROTECTED (FROM DISEASE WITH LIVESTOCK HOSTS)
	COLLABORATION		
EXTENSION • Who needs what information? • Deliver information effectively • Promote behaviour change • Monitor biosecurity and other effects	EDUCATION/ TRAINING	FUTUREPROOFING	MARKET ACCESS IS IMPROVED
	PEST ANIMAL/ WEED IN PASTURE MANAGEMENT	INVESTMENT NEEDS	INCREASED FARM AND SUPPLY CHAIN PROFITABILITY
	POLICY/ LEGISLATION		

Each Priority Area is underpinned by the Tactical Priorities, which were derived from the multiple reviews of the ad hoc investment made by industry and the jurisdictions in biosecurity since circa 2005. The identified livestock biosecurity Tactical Priorities are (in alphabetical order): collaboration, communication, education/ training, pest animal/ weed in pasture management, policy/ legislation, surveillance and traceability. These are still current and relevant for the NABRDES 2023-2028.

Coordinated RD&E activities reaching forward through the Tactical Priorities will generate outcomes in the Priority Areas. For example:

- Researching gaps in surveillance could inform development of national standards for surveillance.
- Development of automation within traceability could feed into new technology outcomes to strengthen Australia's national biosecurity system.
- Extension of targeted information on education and training could contribute to futureproofing biosecurity

IDENTIFYING RD&E CAPABILITIES FOR THE FUTURE

Having sufficient capability to deliver current and future livestock biosecurity requirements is essential to Australia's livestock biosecurity system. A key role of the NABRDES is undertaking gap analyses of current capabilities, and then communicating any identified gaps to stakeholders along with possible solutions for consideration.

Inventory of RD&E capabilities

National RD&E capability has been assessed by the National Biosecurity R&D Capability Audit[10] in 2012 (note that this did not cover Extension); and by the NABRDES Snapshot in 2014 and again in 2019[11].

The 2019 Snapshot consisted of a survey sent to 75 stakeholder organisations (consisting of governments, relevant livestock organisation and other RD&E funder and providers; response rate = 72%). The total investment reported was over $100 million. Analysis of responses revealed that:

- awareness of the NABRDES was high
- the majority of participants considered the NABRDES to be important to their organisation
- organisations were involved with the NABRDES principally through scientific, market access or public health initiatives
- the seven NABRDES Tactical Priorities were all highly important to animal biosecurity RD&E
- funding and institutional barriers were the main challenges to conducting RD&E
- the NABRDES should focus on delivering outputs in the areas of RD&E collaboration, communication, co-ordination and identifying investments in order to improve cross-sectoral animal biosecurity RD&E

Another Snapshot will be conducted in 2023, primarily to reassess the state of national animal biosecurity RD&E, including areas of duplication and areas of deficit. The information will be used to guide governance of the NABRDES 2023-2028.

Ongoing support for effective collaboration between RD&E stakeholders is required. This is cross-sectoral both within animal biosecurity and also externally (e.g. other relevant NPI RD&E Strategies - Plant, Animal Welfare, Environment).

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10   National Biosecurity Research and Development Capability Audit
11   Animal-Biosecurity-RDE-Snapshot-Report.pdf (animalhealthaustralia.com.au)

CHALLENGES AND OPPORTUNITIES

There are several drivers for collaboration and co-investment in cross-sectoral animal biosecurity RD&E such as:

- Climate – changes in environmental conditions influence fauna and flora throughout the animal and plant kingdoms.

- Economic – for example, an outbreak of foot-and-mouth disease in Australia has been estimated to cost anywhere between $5 billion (if small and contained) to $80 billion (large outbreak involving multiple states).

- Information technology – advances continue to be made; biosecurity and surveillance systems can benefit from appropriate adoption of powerful new technologies

- Political – particularly with Australia's trading partners overseas and the maintenance and establishment of export markets and standards. WOAH Standards and country-specific requirements to demonstrate proof of freedom

- Resourcing/expertise – Australia's national biosecurity system is being continually challenged by a long-standing trend of decreasing resources - eroding budgets and declining and uneven biosecurity capability, coordination, and expertise across jurisdictions (e.g. with a noticeable gap in biosecurity specialists, veterinarians and plant scientists amongst other technical experts). Building capability and capacity in the biosecurity system means investing in people, our partnerships and our knowledge and information systems to improve performance and meet current and emerging challenges.

- Social – the impact of an emergency animal disease incursion will have serious social impact, e.g. resulting from measures that may be necessary to contain and decontaminate infected animals/premises

- Trade and passenger – international trade volumes and passenger movements continue to increase, with corresponding increase in the risk of pest and disease incursions (i.e. biosecurity breaches), which may strain current surveillance, containment and eradication capabilities, and risk establishment of novel pathogens within Australia

IMPLEMENTATION

To ensure engagement of stakeholders and implementation of the NABRDES priorities in the livestock biosecurity space, AHA will:

- Deliver an annual forum to share high level biosecurity RD&E priorities and to identify individual priority RD&E activities.

- Deliver a committee prioritisation forum to share organisational priorities and current RD&E, and to discuss opportunities and gaps for priority future RD&E activities.

Implementation of the NABRDES will be detailed in a five-year project plan approved by the Stakeholder Reference Group.

PROJECT PLAN

A five-year project plan will be developed to support the NABRDES. It will include an annual breakdown of activities and deliverables, and suitable performance measures.

COMMUNICATIONS

Communications is the responsibility of the National Animal Biosecurity RD&E Coordinator (from AHA). The Coordinator works with stakeholders to produce and implement a communications plan for the NABRDES.

The communications plan includes:

- An RD&E knowledge exchange forum
- regular capability assessments (the NABRDES Snapshot)
- maintenance of a register of biosecurity RD&E projects and proposals
- Regular communication with stakeholders

FUNDING

There is a shared funding model for the implementation of the NABRDES, which draws on the pre-existing model and engagement with the AGSOC R&I Committee. The funding model was developed in consultation with stakeholders and is articulated in the project plan developed by the Coordinator. The total funding amount is funded 50% by the Commonwealth, and state/territory governments (as per GVP, and excluding the ACT), and 50% by the animal-based Research and Development Corporations including AgriFutures, Australian Egg Corporation, Australian Pork Ltd, Australian Wool Innovation, Dairy Australia, and Meat and Livestock Australia.

The funding covers the costs of the Coordinator and Chair roles, venue costs for the annual Steering Committee meeting, working group costs and annual forum. Stakeholders fund their own costs of attending meetings.

GOVERNANCE

Implementation of the NABRDES is overseen by a Stakeholder Reference Group and Steering Committee.

The Stakeholder Reference Group (SRG) is the overarching committee responsible for making major decisions and changes to the NABRDES. This group includes all the funding bodies of the NABRDES as well as several observers to provide additional technical expertise.

The SRG is also responsible for:

- Communications – communicate and promote the NABRDES (and its outputs) to their organisations and members
- Outcomes – provide strategic direction to project plan delivery, contribute to NABRDES RD&E outcomes and priorities, identify collaborative opportunities and resources and monitor NABRDES progress
- Participate – participate in committee meetings and public stakeholder fora and maintain awareness and presence at main Australian animal biosecurity activities.

Membership of the SRG includes one representative from each of the NABRDES funding bodies.

Observers on the SRG may include:

- University Veterinary, Animal or Agriculture School representatives
- CSIRO
- NBC
- Animal Health Committee
- Other interested parties as approved by the SRG.

The Steering Committee (SC) performs an active role in the day-to-day operation of the NABRDES. In addition to the responsibilities of the SRG, the SC is responsible for making general decisions and actions to ensure the outcomes of the NABRDES are delivered. The SC may also compile information relevant to support major project decisions which are fed into the SRG for action.

Membership of the SC includes the following representatives from the SRG:

- One representative from the Commonwealth Department
- One to two state and territory departmental representative
- One to two representatives from the RDCs
- One to two university representatives
- One Animal Health Committee representative
- One CSIRO representative

The Stakeholder Reference Group and Steering Committee should meet on a regular basis as determined by the Chair on the advice of the Coordinator, with at least two meetings each year. Members will fund their own costs of attending face to face meetings.

NATIONAL ANIMAL BIOSECURITY RD&E KNOWLEDGE EXCHANGE

The NABRDES should maintain and receive two-way engagement, interaction, advice and feedback from the broader stakeholder group. The Stakeholder Reference Group should utilise the NABRDES knowledge exchange fora (such as the Investment Showcase events) as the main means of engaging with stakeholders, but should not rely solely on this.

The forum is coordinated by AHA and it will also be the key mechanism for setting the national animal biosecurity RD&E priorities. The purpose of the forum is to:

- improve communication, delivery, implementation and promotion of RD&E outcomes
- identify opportunities for improving collaboration and partnership between RD&E providers
- determine and set priorities for RD&E activities for future investment and collaboration
- update information on capability and infrastructure and identify gaps in these resources that are needed to deliver these RD&E priorities
- improve the understanding across RD&E providers of commercial and practical biosecurity challenges facing the livestock industries.

The forum may be engaged for a range of reasons, and other activities such as workshops, may arise from it.

SUCCESS FACTORS AND PERFORMANCE INDICATORS

The program logic facilitates monitoring and evaluation to guide continual improvement across all areas of the NABRDES. The Stakeholder Reference Group works with the Coordinator to assess the program logic to determine suitable measurables as part of the development of the accompanying project plan. Identified performance indicators are:

Table 4. Outcomes and performance indicators

	Program Logic outcomes	Performance indicator
Intermediate outcomes	**Informed RD&E decisions and investments -> greater coordination and reduced duplication**	Number of shared, cross-industry investments in animal biosecurity RD&E
	Enhanced cooperation, collaboration and co-investment between stakeholders	Number of gaps in capability and infrastructure identified, ranked by priority and reduced.
	Greater information sharing between stakeholders	Agreement to RD&E priorities.
End of program outcomes	**National biosecurity RD&E priorities addressed**	RD&E outputs meet industry and government agreed needs.
	Efficient use of RD&E resources and capability	Number of shared, cross-industry investments in animal biosecurity RD&E

CONSULTATION AND APPROVALS

The NABRDES 2023-2028 was developed in consultation with the members of the SRG at meetings held in 2022 and then finalised in 2023. Following this, the NABRDES was presented for endorsement to the AGSOC R&I Committee in October 2023.

ANNUAL REVIEWS AND END OF PLAN REVIEW

Annual reviews of the project will be undertaken and will consider and report on several variables including: number of page reviews of the NABRDES webpage, number of stakeholders at public stakeholder meetings, number of RD&E gaps and opportunities identified, and number of RD&E projects presented to and from Animalplan.

The end of project plan review is scheduled for January to June 2028. The review will include an overview of each of the annual review findings, as well as a higher-level strategic review of the project plan schedule, objectives and outcomes (realised and pending). This review may be conducted by a third party or AHA, with a report being presented to the Stakeholder Reference Group.

STAKEHOLDER LIST

Stakeholders in NABRDES include but are not limited to:

Organisation
Australian Alpaca Association (AAA)
Australian Chicken Meat Federation (ACMF)
Australian Dairy Farmers (ADF)
Australian Duck Meat Association (ADMA)
Agforce Queensland
AgriFutures
Animal Health Australia (AHA)
Australian Horse Industry Council (AHIC)
Australian Lot Feeders Association (ALFA)
Australian Meat Industry Council (AMIC)
Australian Meat Processor Corporation (AMPC)
Australian Pork Ltd (APL)
Australian Eggs
Harness Racing Australia
Australian Veterinary Association
Ausvet
Australian Wool Innovation (AWI)
Cattle Australia (CA)
Centre of Excellence for Biosecurity Risk Analysis (CEBRA)
Charles Sturt University
Centre for Invasive Species Solutions (CISS)
Cooperative Research Centre for Developing Northern Australia (CRCNA)
Council of Rural Research and Development Corporations (CRRDC)
Commonwealth Scientific and Industrial Research Organisation (CSIRO)
Department of Agriculture, Fisheries and Forestry (DAFF)
Dairy Australia
Deakin University + Geelong Centre for Emerging Infectious Diseases (GCEID)
Equestrian Australia
Goat Industry Council Australia (GICA)
James Cook University
LiveCorp

Continued

Organisation
Livestock SA
Macquarie University
Meat & Livestock Australia (MLA)
Murdoch University
Northern Territory Cattlemen's Association
Natural Resource Management Regions Australia (NRM)
New South Wales Department of Primary Industries (NSW DPI)
New South Wales Farmers (NSW Farmers)
Northern Territory Department of Industry, Tourism and Trade (NT DITT)
NT Buffalo Industry Council (NT BIC)
Queensland Department of Agriculture and Fisheries (Qld DAF)
South Australia Department of Primary Industries and Regions (DPIR, SA)
Sheep Producers Australia (SPA)
Department of Natural Resources and Environment Tasmania (DNRET)
Tasmanian Farmers Graziers Association
The iThree Institute, University of Technology Sydney (UTS)
The University of Melbourne
University of Adelaide
University of New England
University of Queensland
University of Sydney
University of Tasmania
Agriculture Victoria (AgVic)
Victorian Farmers Federation Livestock Group
WA DPIRD Western Australia Department of Primary Industries and Regional Development
Western Sydney University
Wildlife Health Australia (WHA)
WoolProducers Australia (WPA)