

ANIMAL INDUSTRIES' ANTIMICROBIAL STEWARDSHIP

Research, Development & Extension strategy
2020 - 2025



Acronyms

5Rs	Responsibility, Review, Reduce, Refine, Replace
AIAS	Animal Industries' Antimicrobial Stewardship RD&E strategy
AMR	Antimicrobial Resistance
AMS	Antimicrobial Stewardship
AMU	Antimicrobial Use
ASTAG	Australian Strategic and Technical Advisory Group on Antimicrobial Resistance
AVA	Australian Veterinary Association
AVAMS	Australian Veterinary Antimicrobial Stewardship Conference
NABRDES	National Animal Biosecurity RD&E strategy
RD&E	Research, Development and Extension
SCAHLs	Subcommittee on animal health laboratory standards

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INTRODUCTION

In Australia, the animal industries are responsible for maintaining the health, welfare and productivity of the livestock in their care and ensuring safe food products for human consumption. Access to antimicrobials are an important part of maintaining this responsibility, however they must be used without detriment to human, animal or plant health. Use of antimicrobials may result in the development of antimicrobial resistant (AMR) bacteria, which subsequently reduces the efficacy of antimicrobials to treat infection. The development of AMR is a threat to managing infections in animals and humans, however access to the current range of antimicrobials needs to be preserved so that treatments remain available for injured or ill people and animals. Historical Australian initiatives have resulted in very low levels of AMR bacteria from food animals, however, further progress is needed to ensure this situation remains and Australian industries are afforded relevant opportunities to capitalise on this status.

Antimicrobial stewardship (AMS) is the term used to describe all practices that aim to maintain the clinical efficacy of antimicrobials through optimising the 5R principles – Responsibility, Reduce, Refine, Replace, Review. These principles underpin activities that minimise disease incidence and then if disease occurs that requires antimicrobial treatment, that they are used optimally i.e. the right drug, at the right time, at the right dose, for the right duration using the right route of administration. Therefore, AMS offers a sound foundation for Australian animal industries to contribute to minimising the incidence of resistance.

The Australian red meat, dairy, pork and poultry industries have formed strong links to share information, opportunities and experiences related to progressing AMS in Australian animal industries. They recently collaborated on the preparation of the “Antimicrobial Stewardship in Australian livestock Industries report”¹ and the establishment of the “Australian Veterinary Antimicrobial Stewardship” conference in November 2018. Since that conference, there has been discussion on how to better collaborate on AMS research, development and extension (RD&E) activities of mutual interest and benefit. To this end, the ‘Animal Industry Antimicrobial Stewardship Research, Development and Extension Strategy’ (AIAS) has been produced. This strategy is focussed on prioritising RD&E that enhances AMS activities, rather than a sole focus on reduction in AMR or AMU, which are already comparatively low internationally.

The AIAS has been developed primarily to meet the needs of Australia’s food animal industries, but will also benefit the implementation of *Australia’s National AMR Strategy*² and *The Australian Animal Sector National Antimicrobial Resistance Plan*³. The Australian Veterinary Association (AVA), the Australian Government Department of Agriculture, and AMR management experts were also consulted during the development of the strategy to ensure the AIAS fit within national and international AMR management initiatives and linked to biosecurity initiatives that impact AMU.

Accordingly, the Animal Industries Antimicrobial Stewardship RD&E Strategy (AIAS) aims to:

‘Create a collaborative mechanism for animal industries to identify common research, development and extension (RD&E) priorities for the effective monitoring of antimicrobial use (AMU) and surveillance of AMR to inform stewardship actions that meet Australia’s animal health and market access needs, without impacting food safety or human health.’

Through this strategy, animal industries could maintain access to antimicrobials provided their use was:

- Reviewed using evidence-based science
- Responsible and appropriately managed the risks of AMR development
- Continuously refined and/or reduced
- Managing the risk of having to replace effective antimicrobials with less effective antimicrobials

This Strategy sets out the framework and how it was used to identify priority AMU and AMR R&D and how those outputs feed up through the logic to enhance AMS, through extension.

¹ <https://www.animalhealthaustralia.com.au/antimicrobial-stewardship-in-australian-livestock-industries/>

² <https://www.amr.gov.au/resources/australias-national-antimicrobial-resistance-strategy-2020-and-beyond>

³ <http://www.agriculture.gov.au/SiteCollectionDocuments/animal/health/aus-animal-sector-national-amr-plan-2018.pdf>

BACKGROUND

Australian food animal production systems have historically been judicious in their approach to the use of antimicrobials, which is guided by strict regulatory controls and high animal health status of Australia's livestock. The timeline of AMS for Australian livestock industries⁴ highlights the key initiatives and interventions, including regulatory controls, implemented over time. This stringent stewardship has maintained a very low prevalence of AMR within our food animal value chains compared to food animal industries in some other countries. Australia's extremely low levels of AMR across food animal industries and in food products is a competitive advantage that continues to underpin market access domestically and internationally and is critical to maintaining our ongoing access to antimicrobials without jeopardising animal health, impacting food safety, or human health. Australia's human health AMR management is more complex because of the greater prevalence of resistant organisms and the need to preserve the effectiveness of critically important antimicrobials. There is interdependence of the animal and human health imperatives in preventing and managing AMR risks across human and animal health spectrums. To proactively manage those risks, the Australian government put in place a national AMR strategy in 2014 that set out measures to minimise the risk of increasing AMR across both sectors, using a 'One Health' approach.

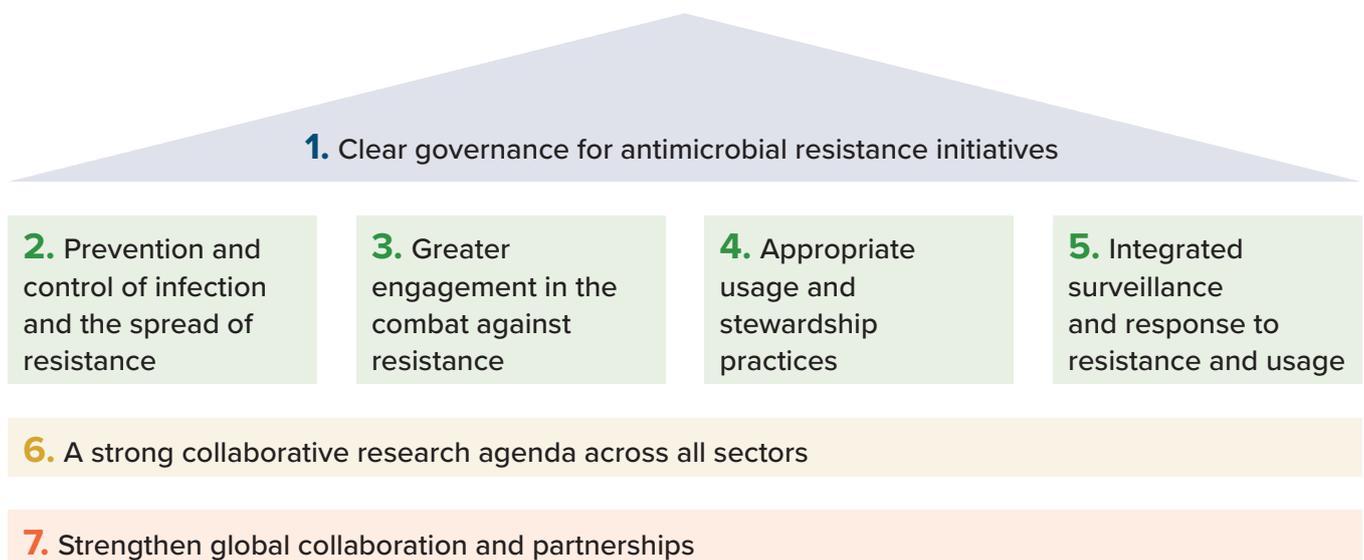
Australia's national strategy is currently being renewed by the Australian Government and includes the following objectives:

1. Clear Governance for Antimicrobial Resistance Initiatives
2. Prevention and Control of Infections and the Spread of Resistance
3. Greater Engagement in the Combat Against Resistance
4. Appropriate Usage and Stewardship Practices
5. Integrated Surveillance and Response to Resistance and Usage
6. A Strong Collaborative Research Agenda Across All Sectors
7. Strengthen Global Collaboration and Partnerships.

The seven objectives are framed around strategic initiatives (1-5) or integration initiatives (6 and 7) with additional detail shown in Figure 1.

⁴ <https://www.animalhealthaustralia.com.au/antimicrobial-stewardship-in-australian-livestock-industries/>

Figure 1: Schematic of the seven objectives within Australia's National Antimicrobial Resistance Strategy⁵



⁵ Adapted from Australia's National Antimicrobial Resistance Strategy – 2020 and Beyond

Work towards those objectives will be encompassed in a range of sector-specific action plans, for example the Australian Animal Sector AMR Action Plan. The AIAS has been contextualised to nest effectively within the broader national AMR management and action plan framework as well as other relevant AMR management initiatives (Figure 2).

The industries involved in the development of the AIAS began the process in conjunction with the inaugural Australian Veterinary Antimicrobial Stewardship Conference (AVAMS) in November 2018. AVAMS was an industry initiative designed to bring together all stakeholders with an interest in AMS in animal industries. This provided a platform for all stakeholders to gain an understanding of the sector-specific issues and initiatives, in the national and international context of reducing the risk of AMR developing. AVAMS identified opportunities for industries to work together to address some of the barriers to understanding and improving AMS across animal industries. In addition, industries have acknowledged that gaps exist that R, D&E can address. This will enable their leadership in developing best-practice AMS to be demonstrated and results applied in the most cost-effective

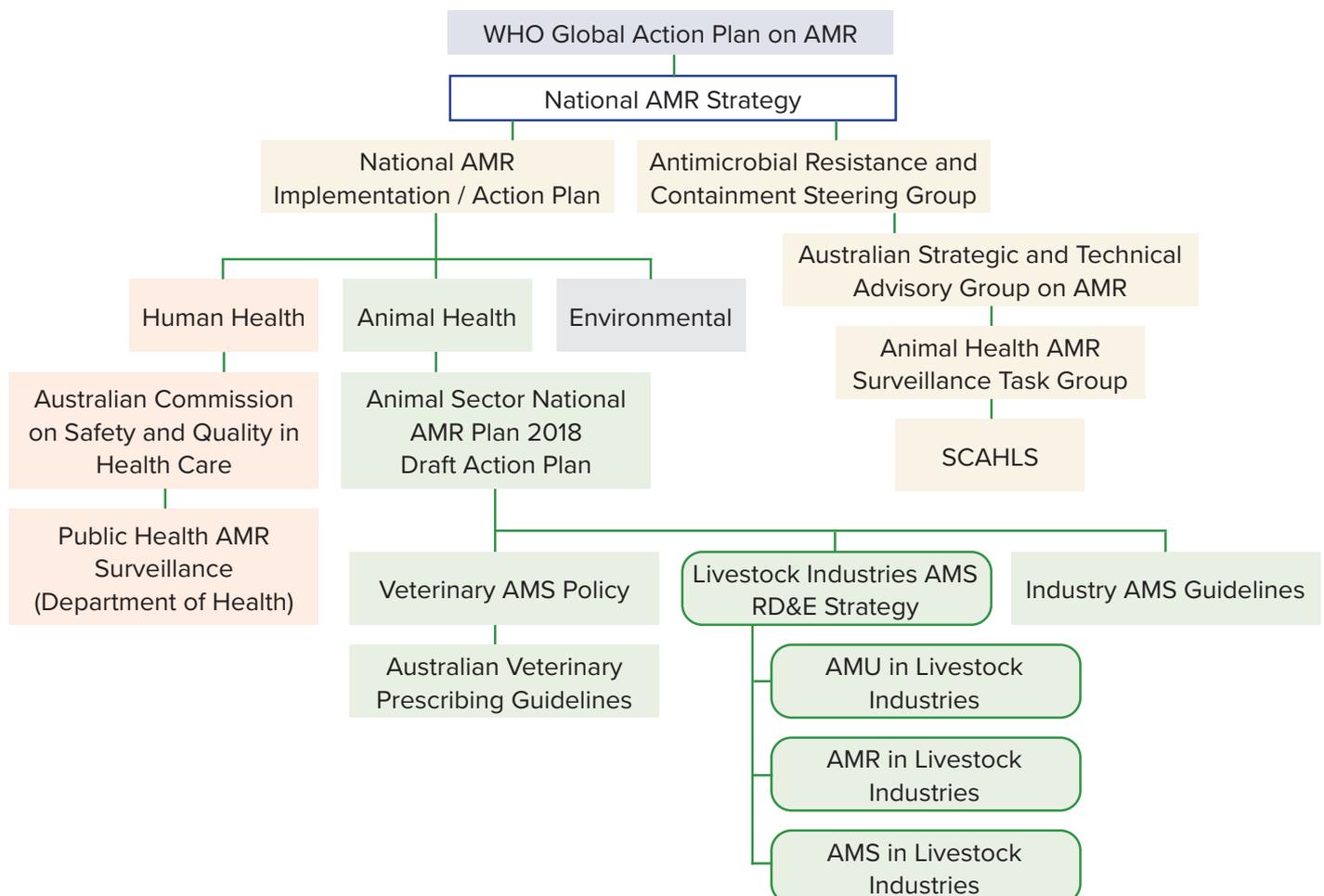
impactful ways. As a result, the red meat, poultry, dairy and pork industries, agreed to proactively co-invest to develop this AIAS

The AIAS will draw benefit from Australia's National Animal Biosecurity RD&E Strategy (NABRDES) as investment in biosecurity priorities is one pillar underpinning good AMS. Likewise, benefits from an effective AIAS will flow to the NABRDES, Australia's national animal welfare RD&E strategy through improved AMU, and the national AMR strategy by advancing the convention of the 5R's (Responsibility, Review, Reduce, Refine, Replace) which are at the core of best-practice AMS.

An overview of antimicrobial stewardship within Australian Livestock Industries was reported in November 2018 and details historical and current practices relevant to AMS and the 5Rs for each of the contributing industries (Chicken meat, Dairy, Duck meat, Egg, Grain-fed beef/Grass-fed beef, Pork, Poultry primary breeders and Turkey)⁶

⁶ <https://www.animalhealthaustralia.com.au/antimicrobial-stewardship-in-australian-livestock-industries/>

Figure 2: How Australian cross sectoral AMR Management Initiatives, (National animal industries AMS RDE strategy - red outline), aggregate up into the global AMR containment strategy



STRATEGY PURPOSE

Aim

‘The collaboration of animal industries in the identification of common research, development and extension (RD&E) priorities for the effective monitoring of antimicrobial use and surveillance of AMR to inform stewardship actions that meet Australia’s animal health and market access needs, without impacting food safety or human health.’

Scope

The scope of the AIAS includes:

- AMR, AMU and their impact on best-practice AMS
- Food animal industries (this strategy should aim to incorporate all industries that use antimicrobials, or may be impacted by the use of antimicrobials in other sectors)
- Providing a mechanism to fund and implement AMS RD&E priorities for terrestrial food animal industries

The scope of the AIAS does not include:

- AMU/AMR/AMS advocacy
- AMU/AMR/AMS policy development.
- The development of new antimicrobial products
- AMS RD&E for companion animals except where results will be applicable
- Animal biosecurity RD&E (relevant actions will be forwarded to the Animal Biosecurity RD&E Strategy).

Risks

Risks to the AIAS that will be monitored and managed include:

- Scope creep as the AIAS is made fit for purpose.
- This is a food animal industry strategy and AMR researchers, Governments with active AMR strategies and companies that supply antimicrobials were not directly involved in its development to avoid real or perceived conflicts of interest. However, options are provided for their engagement in the Strategy’s activities as each of these sectors represent valuable stakeholder groups that should not be excluded from opportunities to support animal industry priorities.

- The lack of new antimicrobials being approved for use in animals, and the potential for loss of approved antimicrobials as animal medicines present a risk to progressing long-term AMS initiatives.

What does success look like?

The AIAS provides a platform for cross industry collaboration that prioritises, supports and progresses:

- industry support and investment in collaborative RD&E that results in enhanced AMS across food animal industries
- clear understanding by all stakeholders, customers and consumers that AMU and AMR within Australian food animal industries is amongst the lowest in the world and the initiatives that underpin this
- translation of AMS best practice into different AMS requirements for individual industries
- the efficient use of resources where duplication is avoided
- identification of cross-sectoral RD&E gaps and opportunities for collaborative investment that is strongly linked to strategy outcomes

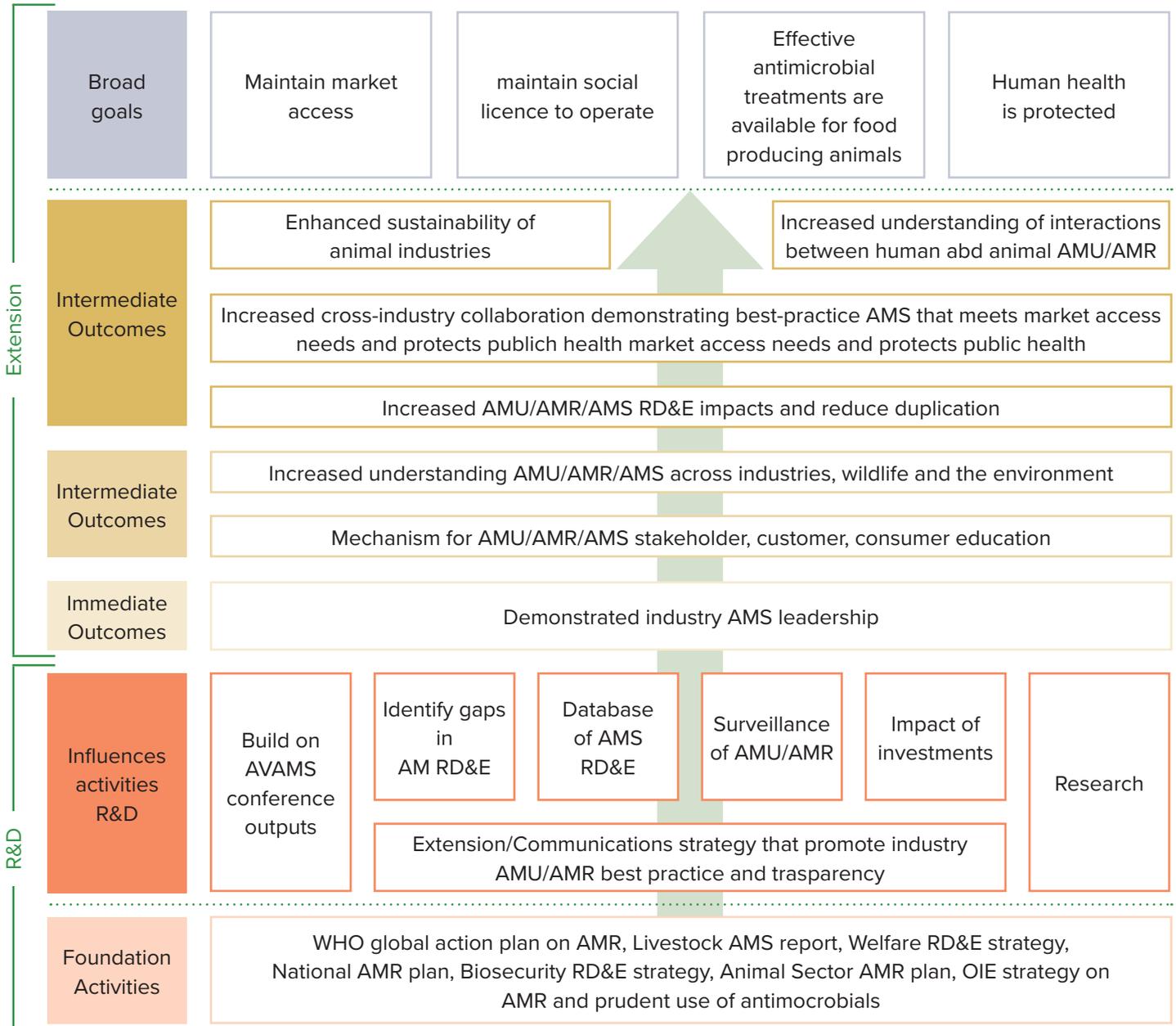
What does success accomplish

Animal health and welfare is maintained as a result of:

- ongoing access to currently approved antimicrobials and usage practices that reduce the risk of resistance developing to preserve the range of effective treatment options available for veterinarians to prescribe for use in food animal production.
- Antimicrobial use by food animal industries does not impact food safety or public health.

PROGRAM LOGIC FRAMEWORK

Figure 3: AIAS Program logic - this framework depicts how RD&E tasks (influencing activities) will lead to Strategy AMS outcomes and ultimately reduce the risk of AMR through evidence-based management



The AIAS was created by designing a program logic framework (Figure 3) that laid out the critical work needed to achieve industry and broader goals resulting in:

- Demonstrating industry leadership in AMU, AMR and AMS
- Understanding unique AMS needs between industries
- Minimising duplication and identifying opportunities to collaborate
- A mechanism for stakeholder co-investment with industry, and
- Harmonisation of initiatives including AM surveillance, AMU and AMS.

Strategy Framework – Pathways to Delivery

Through the process of designing the Program Logic framework for the AIAS, two pathways were identified that link foundational activities to end of program outcomes. In practice these will most likely be progressed through a phased investment:

Phase 1 - R&D priority investments by industry are aimed at:

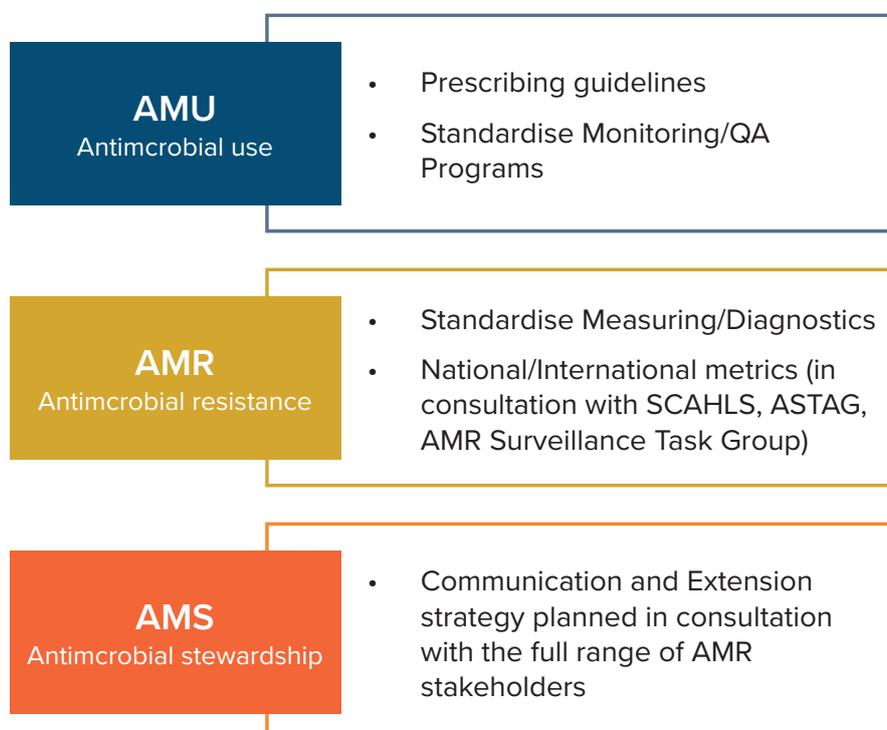
- understanding wider perceptions of industry AMU and AMR
- gaps in AMS RD&E
- quantifying AMU
- defining what ‘relevant and meaningful’ AMR surveillance is for each industry, and
- measuring and reporting the impacts of AMU/AMR/AMS investments made by industries, Research and Development Corporations, Peak Industry Councils and the intersections where governments co-invest with industries.

Phase 2 - Extension priority investments by industry are aimed at:

- assisting stakeholder in the implementation of R&D outcomes
- Communicating that industry is committed to AMS leadership
- Demonstrating that industries are committed to systems that guarantee food safety without negatively impacting animal or human health and welfare, and
- Investing in RD&E that is critical for maintaining market access (domestic and international) for food animal industry products

The AIAS will ensure that investment priority outputs will link to the National AMR strategic and integration objectives where they can be used to serve the needs of industry and the broader framework’s goals. Identifying and prioritising specific projects will form the core action of the AIAS Steering Committee.

Figure 4: How the animal Industries AMS RD&E Priorities will contribute to broader AMR management programs



GOVERNANCE

Monitoring & Evaluating

Monitoring and evaluation of the AIAS will be important to capture its value and measure its success. M&E will encompass capturing data relevant to informing the success of the collaborations formed as well as industry narratives, calculating impact from investment, communicating progress toward outcomes as well as driving management practice change via extension.

Key deliverables of the AIAS will be:

- Demonstrating how the landscape of AMU/AMR RD&E investments will deliver industry relevant best-practice AMS
- Support with coordination of the AVAMS conferences and actioning outputs
- Implementation of AMU/AMR RD&E outputs to achieve positive AMS outcomes

Funding

Implementing the AIAS is a priority for food animal industries. The preliminary structure will include 0.25FTE dedicated to coordinating the strategy, with a small proportion of funds to support operating expenses (e.g. meeting costs). Members of the stakeholder working group must be committed to co-investing in the base cost of strategy coordination, the cost of which is to be evenly split between Members. The level of cash and in-kind contributions provided to proposed cross-sectoral projects will be a decision for each individual Member in the context of their industry's priorities, as proposals are presented. Costs to attend meetings are to be borne by each individual attendee.

The base cost covers:

- Coordination of biennial stakeholder meetings and relevant meeting papers
- Facilitation of Steering Committee member engagement
- Finalisation of the AIAS documents (including the strategy and M&E frameworks)
- Identification and coordination of AMS information exchange
- Support for the AVAMS steering committee
- Ongoing support and coordination of AIAS activities, including facilitation of driving co-investment opportunities, drafting tender documents and identifying potential other additional funding sources

Stakeholder Steering Committee

- The Stakeholder Steering Committee will be responsible for ensuring that:
- Strategy priority RD&E investments are identified and implemented
- Strategy extension and communication deliverables influence practice change
- The AVAMS conference continues as Australia's preeminent forum for the exchange of animal industry AMU/AMR/AMS relevant RD&E in ways that compel practice change
- The strategy is strongly linked to the National AMR Strategy, National animal AMR Action Plan, National Animal Biosecurity RD&E Strategy and National Animal Welfare RD&E Strategy.

Members

The AIAS operation will require a Stakeholder Steering Committee that consists of financial members from:

- relevant RD&E funding body representatives for food animal industries
- relevant food animal industry Peak Industry Council representatives
- relevant state and federal government representatives

Financial members will contribute cash to the base cost of coordinating the strategy and be responsible for identifying and prioritising activities and co-investment opportunities.

From these members, there will be selected:

- A Chair; responsible for progressing the strategy
- A deputy Chair (from a different organisation); responsible for supporting the Chair
- At least one strategy Champion; responsible for championing the importance, progression and relevance of the AIAS.

To ensure broad representation, each contribution provides a single industry with two positions on the Steering Committee.

Observers

It is relevant to include various 'observers' for the strategy, which capture additional stakeholders with an interest in animal industry AMS, but for which member status is either not feasible or not relevant.

Observers may consist of a:

- representative from relevant Government Committees including:
 - Animal Health Committee (AHC) Subcommittee on Animal Health Laboratory Standards (SCAHLs)
 - Australian Strategic and Technical Advisory Group on AMR (ASTAG)
 - Human Health sector representatives
- representative from Animal Health Australia (as representatives of the Animal Biosecurity RD&E strategy and important stakeholder in animal health) representative of Animal Medicines Australia.
- Observer status is granted by the Members. Observers may be able to contribute to relevant cross-sectoral projects, on the consideration and approval of Members. Observers have no authority to influence the priorities for cross-industry investment.

Strategy review

The AIAS will be reviewed in line with the review of other relevant guiding documents such as the National AMR Strategy and the Australian Animal AMR Action Plan, both of which have minimum review timeframes of 5 years. However, regular revision will be required to ensure the strategy remains relevant as it grows and changes to meet stakeholder needs and priorities.