
NATIONAL PRIMARY INDUSTRIES RESEARCH, DEVELOPMENT & EXTENSION (RD&E) FRAMEWORK

Animal Welfare RD&E Strategy

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ACKNOWLEDGEMENTS

This Strategy has been prepared by the Steering Committee of the National Primary Industries Animal Welfare RD&E Strategy, chaired by Alan Tilbrook and comprising the major investors and providers of animal welfare RD&E.

STEERING COMMITTEE MEMBERS

Alan Tilbrook (Centre for Animal Science, Queensland Alliance for Agriculture and Food Innovation)
Jojo Jackson (Australian Eggs Limited)
Brad Mathers (Australian Meat Processor Corporation)
Pat Mitchell (Australian Pork Limited)
Bridget Peachey (Australian Wool Innovation)
Kathryn Davis (Dairy Australia)
Sam Brown (LiveCorp)
Jim Rothwell (Meat and Livestock Australia)
Michael Beer (Rural Industries Research and Development Corporation)
Susan Hazel (Animal Welfare Science Centre, University of Adelaide)
Andrew Fisher (Animal Welfare Science Centre, University of Melbourne)
Jane Quinn (Charles Sturt University)
Caroline Lee (CSIRO)
Teresa Collins (Murdoch University)
Tim Mahony (University of Queensland)
Peta Taylor (University of New England)
Peter White (University of Sydney)
Cameron Ralph (Animal Welfare Science Centre, South Australian Research & Development Institute)
Joe Jacobs (Department of Economic Development, Jobs, Transport and Resources, Victoria)

Executive Officer

Jeremy Skuse (Animal Welfare Science Centre, University of Melbourne)

Champions

Alan Tilbrook, (Centre for Animal Science, Queensland Alliance for Agriculture and Food Innovation)
Andrew Spencer, CEO, (Australian Pork Limited)

OBSERVER MEMBERS

Stephen Hodge (Australian Government Department of Agriculture and Water Resources)
Kelly Wall (Animal Health Australia)
Melina Tensen (RSPCA Australia)

FURTHER INFORMATION

Further information on the national RD&E framework and underpinning sector and cross-sector strategies can be found at <http://www.npirdef.org/strategies>.

The final report and appendices for the 2017 “Animal Welfare Research, Development and Extension Capability and Infrastructure Inventory for the Australian Livestock Sector” are available from Jeremy Skuse (jskuse@unimelb.edu.au).

1. ABBREVIATIONS AND ACRONYMS

In this Strategy, the following acronyms are detailed;

AAWS	Australian Animal Welfare Strategy
AGSOC	Advisory Committee to the Agriculture Senior Officials Committee
ANZSRC	Australian and New Zealand Standard Research Classification
ARC	Australian Research Council
AWSC	Animal Welfare Science Centre
CAWE	Centre for Animal Welfare and Ethics (University of Queensland)
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation.
DAFWA	Department of Agriculture and Food, Western Australia
DPIV	Department of Primary Industries, Victoria
FoR	Fields of Research
FTE	Full Time Equivalent(s)
NAWRDE	National Animal Welfare Research, Development and Education/Extension Strategy
OIE	Office International des épizooties: World Organisation for Animal Health
PIMC	Primary Industries Ministerial Council
PISC	Primary Industries Standing Committee
QAAFI	Queensland Alliance for Agriculture and Food Innovation
R&D	Research and Development
RD&E	Research, Development and Education/Extension
RDCs	Rural Research and Development Corporations
R&I	Research and Innovation
SARDI	South Australian Research, Development and Innovation
SCoPI	Standing Council on Primary Industries

2. EXECUTIVE SUMMARY

The National Animal Welfare RD&E Strategy (NAWRDE, the Strategy) is a component of the National Primary Industries RD&E Framework, an initiative of the Standing Council on Primary Industries (SCoPI), and supported by the Primary Industries Standing Committee (PISC).

Oversight of the development and implementation of the National Primary Industries Research Development and Extension Framework is a key responsibility of the Research & Innovation Committee (R&I) which is an Advisory Committee to the Agriculture Senior Officials Committee (AGSOC).

The broad aims of the Strategy are to provide;

1. Leadership for animal welfare R&D issues in the livestock industries;
2. Collaborative co-investment platform for investment in cross sectoral animal welfare R,D&E for agriculture;
3. Maintain a register of animal welfare R&D activities and outcomes by the various sectoral interests
4. National arrangements to deliver strong collaboration amongst existing RD&E provider groups, and effective partnership between investors and providers.

Following input from attendees at the 2013 and subsequent annual Strategy Forums and discussion at meetings of the Steering Committee, it was decided to revise the RD&E Themes to more closely reflect those areas of RD&E which are more applicable to cross-sectoral, collaborative application.

The revised Themes which will guide cross-sectoral investment in RD&E activities under the Strategy are:

1. Animal Welfare Assessment
2. Pain Assessment & Management
3. Management, Housing & Husbandry
4. Transport, Euthanasia & Slaughter Impacts
5. Attitudinal Effects on the Welfare of Livestock throughout the Value Chain
6. Education, Training & Extension

An audit of current animal welfare RD&E capability, infrastructure and investment was conducted during 2016. The audit identified that there are some 54 Full Time Equivalents (FTEs) dedicated to animal welfare RD&E in Australia, representing an increase of approximately 35% compared to an audit carried out in 2010. The audit also compared current capability with the capability required to deliver on the agreed 6 RD&E themes, to identify gaps that will need to be addressed for effective delivery of the Strategy. The implementation of this Strategy will identify strategies to address these gaps in capability.

Overall, it appears that the livestock industries are well placed with access to the majority of R, D&E capabilities, (human and infrastructure), that it requires to address industry priorities over the next 5-10 years but it is apparent that focussed planning will be required to ensure that capability is ensured in certain disciplines to support those themes which will gain in importance due to changing market and community concerns.

Further analysis of capability against the 6 themes indicated that effort will be required to access several key capabilities from other R,D&E sectors, such as for animal welfare monitoring and engineering/housing, sociology and ethics and extension and adoption in order to ensure that the key RD&E Themes can be adequately resourced.

In relation to more formal collaborative arrangements, under this Strategy, the value and importance of multi-organisational strategic partnerships in building capability and maintaining a critical mass to address animal welfare RD&E priorities cannot be overestimated. The Strategy will seek to actively support existing strategic partnerships through pursuing co-investment arrangements and long term funding agreements that provide R,D&E organisations with the funding certainty required to maintain and build capability and will seek to identify and promote opportunities to establish new collaborative arrangements to help maintain existing capability and to fill capability gaps.

Animal welfare R, D&E is a high priority for all livestock industry RDCs and all are planning to either increase or maintain their current levels of investment in this area. The Strategy provides a key opportunity for the RDCs to efficiently invest in high priority, cross-sectoral, collaborative projects.

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4. INTRODUCTION

Commonwealth and State Agriculture Ministers recognise that RD&E has a crucial role in underpinning productivity, growth, competitiveness and sustainability of Australia's primary industries and market access and trade. RD&E organisations across Australia together form a very complex web of research providers and investors who are independent operators with strong interconnections. The 16 rural R&D corporations and industry-owned companies (RDCs) are an integral component of this web, as well as the state and territory governments, CSIRO, universities and private research providers.

Nationally, RD&E investment in primary industries, which exceeds \$1.7 billion annually, needs to be better focussed as the current competitive RD&E model duplicates effort and resources. Combined with the recent decline in Australia's RD&E capacity and capability, a strong case was made for a national approach to Australia's investment in RD&E to provide a focussed, efficient, effective and collaborative RD&E future.

In 2005, the Primary Industries Ministerial Council (PIMC) endorsed the development of a National Primary Industries Research, Development and Extension Framework. The framework promulgates the concept of 'National R with Regional D&E' recognising that basic, strategic and some applied research (R) can be provided from a distance, and that regional adaptive development (D) and local extension (E) is required to improve the uptake of innovation by industry.

The framework contains a national RD&E Strategy for 14 industry sectors (beef, cotton, dairy, fishing and aquaculture, forestry, grains, horticulture, new and emerging industries, pork, poultry, sheep meat, sugar, wine, and wool), and 7 cross-industry sectors (animal biosecurity, animal welfare, biofuels and bioenergy, climate change, food and nutrition, plant biosecurity and water use in agriculture).

At the request of the Primary Industries R&D Sub-committee, the Victorian Department of Primary Industries (DPIV) facilitated the development of a national Strategy for animal welfare RD&E (the 'Strategy'). The Strategy was developed in close consultation with major investors and providers of animal welfare RD&E services, with industry providing a leadership role. The Strategy built on the work already undertaken by the Australian Animal Welfare Strategy (AAWS) towards defining RD&E priorities and enhancing national collaboration and communication.

The Australian Government reviewed the National Research Priorities in 2007 in consultation with state and territory governments, industry, and RD&E investors and providers. The R&D priorities focussed R&D investment in areas of greatest need and were particularly important in guiding the RDCs and thus impacted significantly on the work of research providers and other research investors in related fields. A shared approach to priority setting among the players is recognised to focus R&D efforts on issues of major importance and enable issues of common concern to be explored in a coordinated and cost effective way.

In 2013, the South Australian Research and Development Institute took over as lead agency for the Strategy which is a component of the National Primary Industries RD&E Framework, an initiative of the Standing Council on Primary Industries (SCoPI), and supported by the Primary Industries Standing Committee (PISC).

The national animal welfare landscape changed in 2014 when the Commonwealth withdrew its support for the Australian Animal Welfare Strategy (AAWS). The AAWS initiative was supported by the State, Territory and Commonwealth governments and organisations within all the animal industries and aimed to support joint partnership, focus towards a national agenda and regular

communication between industry, government, universities and animal welfare organisations. The AAWS objectives were broader than livestock welfare RD&E however, extending to the wellbeing of all animals in Australia.

The demise of AAWS has focused importance upon the Strategy as the sole national, cross-sectoral body in the animal welfare R&D space.

Oversight of the development and implementation of the National Primary Industries Research Development and Extension Framework is a key responsibility of the Research & Innovation Committee (R&I) which is an Advisory Committee to the Agriculture Senior Officials Committee (AGSOC).

The purpose of the Strategy is to develop national arrangements to deliver strong collaboration amongst existing RD&E provider groups, and effective partnership between investors and providers.

This Strategy underpins the National Research Priorities (Food Priority). It is anticipated that this Strategy, in conjunction with the other cross sector and sector specific Strategies, will further inform and contribute to the refreshment of the National Research Priorities over time.

By ensuring the substantial resources invested by government and industry in research are managed cooperatively, a more efficient, effective and comprehensive capability will be possible. Success will be achieved by the demonstration of a more coordinated and collaborative approach to rural RD& E, more focussed national research capability and more efficient RD&E uptake by primary industries to achieve the identified goals.

5. PURPOSE

A national animal welfare RD&E Strategy that will deliver strong collaboration amongst existing RD&E provider groups and effective partnership between investors and research providers.

More specifically, the Strategy will:

- Provide a situation analysis of animal welfare RD&E in Australia, including infrastructure and science capability and gaps;
- Develop an agreed national RD&E Strategy including priorities for animal welfare RD&E;
- Develop a model that will facilitate collaboration and partnerships between investors and providers;
- Develop an implementation plan for the RD&E Strategy.

6. RESEARCH, DEVELOPMENT AND EXTENSION VISION

“A national animal welfare RD&E Strategy that contributes sound, science based options for improved animal welfare, community confidence and market access.”

7. SCOPE

The national RD&E Strategy for animal welfare will include the development, implementation and delivery of RD&E nationally for livestock (farm animals) from the point of rearing at the farm (birth) to the point of processing (slaughter).

In designing the Strategy, a flexible approach was adopted so that the scope can be readily expanded sometime in the future to include other categories of animals that are also the responsibility of State and Territory Agriculture Ministers such as farmed fish/aquaculture.

8. SITUATION ANALYSIS

For reasons ranging from increased community interest in animal welfare, market access issues for both domestic and export markets for livestock industries, state and federal governments, Universities and industry funding bodies all provide resources for animal welfare RD&E.

To determine current gaps and future needs in animal welfare RD&E in relation to capability, infrastructure, investment and collaborative opportunities a comprehensive “*Animal Welfare Research, Development and Extension Capability and Infrastructure Inventory for the Australian Livestock Sector*” was commissioned to collect data on current capability and infrastructure. This document provided a basis for identifying capability gaps and future RD&E needs to inform the development of this Strategy.

This document is provided separately to this Strategy, and is available from the Strategy Executive Officer. Details are provided on page 2, under ‘further information’.

9. ANIMAL WELFARE IN AUSTRALIA – THE SECTOR OVERVIEW

Livestock industries need to be able to ensure strategies are in place to manage productivity and animal welfare issues and to deal with changes in community values and consumer preferences in the immediate term and over time. Science plays a key role in generating sound knowledge and promoting a well-informed debate on the appropriate treatment of animals. The assessment of animal welfare requires a multifaceted approach and the risks associated with new or alternative technology, systems and practices need continual attention and management as part of daily business. Animal welfare standards are improved through an improved scientific understanding of animal welfare and factual information about animal treatment. The development of credible animal welfare policy needs to be soundly based in science, otherwise the growth and market access of Australian animal industries and the current freedoms of animal ownership will be jeopardised.

Australia has an impressive record in animal welfare RD&E, demonstrated by the number of peer reviewed publications, presentations at international conferences and positions on international committees and advisory groups. There is already a reasonably strong focus on collaboration, demonstrated through interactions between individuals in science, industry, government and animal welfare organisations, particularly in terms of joint determination of RD&E priorities.

A significant number of collaborations have been established in animal welfare science between RD&E investors and providers, ranging from collaboration at the project level or through grant programs, to more formal collaboration between organisations. The most formal of these are three dedicated “Centres” with focus on animal welfare RD&E in Australia. The Animal Welfare Science Centre is an unincorporated joint Centre partnered by the University of Melbourne, the Department of Economic Development, Jobs, Transport and Resources, Victoria, The University of Adelaide and the South Australian Research and Development Institute. The other two recognised Centres are the CSIRO Livestock Industries division based at Armidale and the Centre for Animal Welfare and Ethics, based at the University of Queensland. Further collaborations exist between stakeholders as part of the various industry Co-operative Research Centres (e.g. pork, sheep and poultry CRCs) and for projects underpinned by other joint funding initiatives and R&D grant programs, including Australian Research Council (ARC).

Finally, it is recognised that collaboration exists between Australian and New Zealand RD&E providers. The World Organisation for Animal Health (OIE) collaborating centre for animal welfare science and bioethical analysis: The David Bayvel consortium is a joint New Zealand and Australian OIE Collaborating Centre and is a recognised centre of expertise in animal welfare. Its member scientists, (from the Animal Welfare Science Centre (AWSC), Centre for Animal Welfare and Ethics at the University of Queensland (CAWE), CSIRO, Massey University and AgResearch NZ), provide expert scientific, bioethical and educational advice to the OIE, scientific and technical training and will coordinate scientific and technical studies in Australia, New Zealand and for the Asia and Oceania Region.

The Strategy recognises the need for continuity and security in funding to enable organisations to maintain the required capability for future animal welfare RD&E. Whilst considerable effort is placed on developing capability through medium and long term projects, animal welfare research is somewhat reactive in nature, often addressing issues that are of immediate concern to industry market access or that have attracted the attention of Governments through community and customer pressure.

10. ANIMAL WELFARE RESEARCH, DEVELOPMENT AND EXTENSION CAPABILITY AND INFRASTRUCTURE FOR THE AUSTRALIAN LIVESTOCK SECTOR

The Strategy commissioned the “Animal Welfare Research, Development and Extension Capability and Infrastructure Inventory for the Australian Livestock Sector” 2016. (Appendix 1 and 2).

Using a blended methodology of an on-line survey and interviews, respondents were asked to outline their organisation’s human and physical capability to deliver animal welfare research, development and extension programs in the livestock sector.

Full details can be found in the appendices and key learnings are outlined below.

INFRASTRUCTURE

The major providers of animal welfare R, D&E services to the livestock industries provide the key platform for the current and future capability required to meet industry’s objectives. An understanding of these research providers forward infrastructure planning and priorities, while necessarily a qualitative assessment, provides valuable insights in assisting the consideration of future industry infrastructure requirements, emerging gaps and strategies to be addressed.

Based upon the results of the audit, it appears that facilities required to conduct animal welfare RD&E are adequate to service current and future needs. Whilst some organisations identified that a lack of suitable infrastructure and facilities in some areas was a concern, (for example, animal environmental chambers to measure heat stress), collaboration with other organisations to access infrastructure and facilities will likely overcome these concerns. Some organisations reported that their facilities will be updated and despite urban pressure, no organisation indicated that they will reduce infrastructure and facilities for animal welfare R, D&E in the next five years.

CAPABILITY

The largest concentration of current animal welfare researchers is located at the University of Melbourne, SARDI, CSIRO and University of Queensland, each having between 6 and 11 researchers. A second group of organisations, comprising University of WA, Murdoch University,

University of New England, University of Adelaide and University of Sydney each have 3 – 4 researchers.

The distributions of age and research experience of researchers indicates a good spread of experience and scope for succession in these institutions. Most researchers hold postgraduate qualifications, 72% with a PhD and 12% with a Master's degree.

The analysis of capability was considered against the Strategy Themes and can be summarised;

1. Animal Welfare Assessment theme:

Existing capability, primarily through animal behaviour expertise is strong however, increased access to capability associated with fields such as automated welfare monitoring systems and biosensors will be necessary to meet the objectives of this theme. This additional capability exists in other RD&E sectors (both agriculture and non-agriculture) and should be accessible.

2. Pain Assessment & Management theme:

Existing capability is generally well placed, although there are multiple, relevant fields of research capability (for example veterinary anaesthesiology, pharmacology, neurobiology) that will need to be accessed from other RD&E sectors to meet the likely capability requirements to achieve the theme's objectives.

3. Management, Housing & Husbandry theme:

Of all the NAWRDE Strategy priority themes, the 'Management, Housing & Husbandry theme' is best placed to achieve its objectives based upon current animal welfare researcher capability.

4. Transport, Euthanasia & Slaughter theme:

This theme shares key relevant capability requirements with several other themes, particularly 'Animal Welfare Assessment', 'Pain Assessment & Management' and 'Management Housing & Husbandry'. Consequently, it has strong capability in a number of key fields, such as animal behaviour, animal management and animal nutrition. However, meeting the objectives of this theme will, in concert with other priority themes, require accessing several key capabilities from other R, D&E sectors, such as for animal welfare monitoring and engineering/housing.

5. Attitudinal Effects on the Welfare of Livestock throughout the Value Chain theme:

There are indications that this priority theme is of increasing importance for the NAWRDE Strategy. It is also noteworthy that this theme will be highly interactive and contributory to all other priority themes in the strategy. The results from the capability survey suggest that this theme warrants greatest consideration for the adequacy of capability to meet the immediate and near term priorities of the NAWRDE Strategy. Total current capability is limited and increased capacity will be required. There is potential capacity in the social sciences in several government departments and universities, however, social science capability is increasingly being sought by the agricultural production sector (particularly in the design and development of new extension delivery models and for research design and prioritisation). Consequently, the ease and assuredness of being able to access the necessary capability from other RD&E sectors will be a high priority for the Strategy.

6. Education, Training & Extension theme:

This theme is of comparatively lower priority with respect to researcher capability, with the key capability being provided by non-researchers. However, researchers can provide a valuable degree of supporting capability. The results from the capability survey indicated that a small percentage of current animal welfare researchers directly participate in this theme and thus opportunities exist for

broadening researchers' engagement and skills to support the theme. As new extension models evolve, it is highly likely that there will be a growing need for researchers who can effectively interface with Industry Advisory staff.

The audit identified 12 animal welfare postgraduate students carrying out research predominately in the Fields of Research of Animal Behaviour and Animal Management; this contrasts with the capability audit performed in 2010 which reported that there were 23 postgraduate students engaged in animal welfare-related study.

11. IDENTIFYING CAPABILITY FOR THE FUTURE

Critical to ensuring that Australia's animal welfare RD&E needs are able to be resourced over the next 5-10 years is the ability to attract students and mentor them towards a long-term involvement in animal welfare RD&E. Current students are working predominately in the Fields of Research of Animal Behaviour and Animal Management, two fields that are comparatively well resourced by existing researchers. The Strategy will consider attracting students to contribute to key capabilities required for the updated NAWRDE Strategy priority themes, such as Animal Neurobiology, Engineering Instrumentation, Humane Animal Treatment and Sociology and Ethics.

The implementation of this Strategy will identify capability needs against the RD&E themes, and strategies to address gaps in capability.

12. IDENTIFYING NATIONAL RD&E PRIORITIES

Animal Welfare RD&E priorities are broad ranging. Some impact multiple industries while others are specific to individual industries, species and sectors. In recent years, considerable effort has been directed towards identifying RD&E priorities for animal welfare both within and across RD&E organisations and industries. Given this, the Strategy Steering Committee gathered animal welfare priorities from existing government and industry strategic plans and arranged into 6 RD&E themes to provide a broad direction for the Strategy. The themes reflect both industry specific and cross industry current RD&E activities and anticipated future direction at national, regional or local levels. The themes are as follows:

1. Animal Welfare Assessment
2. Pain Assessment & Management
3. Management, Housing & Husbandry
4. Transport, Euthanasia & Slaughter
5. Attitudinal Effects on the Welfare of Livestock throughout the Value Chain
6. Education, Training & Extension

Each theme is underpinned by several "focus areas" which describe in further detail, the project categories that underpin the outcome described for each theme. The implementation model for this Strategy allows for investors and R&D providers to reach agreement on research priorities and activities for individual industries and multiple industries (cross sectoral projects) within each focus area in accordance with the participating organisations' strategic goals and priorities.

The broad nature of the themes and focus areas enables flexibility for participating organisations. It is expected that RD&E investors and providers will continue their individual priority planning processes to identify specific priorities based on the needs of their constituents or end-users. These identified priorities will inform this Strategy and provide a basis for identifying priorities of national, industry specific and/or cross sectoral significance and on this basis, potential collaboration and co-investment.

It is acknowledged that animal welfare RD&E priorities will change over time as a result of change in public and community attitudes, customer and market expectations and as a result of other influences including practice change, technology and innovation in the livestock industries.

A summary of the 6 strategic RD&E themes and focus areas is provided below in table 1.

Table 1. Animal Welfare RD&E Themes and focus areas

RD&E Theme	RD&E Focus Area	Outcome
1 Animal welfare assessment - For the whole value chain	Identify/develop specific and objective measures of animal welfare Novel methods of assessment (physiological and behavioural, remote) Develop animal welfare assessment protocols Minimisation of negative states Optimise positive welfare states	Enhancing current methodology in animal welfare science towards establishing, amending and/or validating animal welfare standards and practices Demonstration of continuous improvement in animal welfare
2 Pain assessment & management:	Novel methods of assessment and pain management Improvement/replacement of aversive practices	Minimising risks to animal welfare by improving pain management and mitigation for animal husbandry and management procedures and/or developing alternatives
3 Management, housing and husbandry	Investigating the welfare implications of existing and alternative production systems Mortality Environmental enrichment	Improved animal welfare outcomes through the application of enhanced farm and supply chain management practices and tools and improved housing and production systems which minimise and/or mitigate animal welfare risks
4 Transport, euthanasia and slaughter	Research is conducted into systems and practices that enhance animal welfare across the supply chain Improved management strategies are developed that safeguard animal welfare during transport Implications for animal welfare associated with transport, euthanasia, stunning and slaughter are identified and assessed Options for improving the uptake of approved practices for euthanasia and slaughter are examined Options for mass slaughter in the event of emergency (e.g. disease) are investigated	Improved understanding of the animal welfare risks associated with transport, stunning and slaughter and better application of enhanced practices to minimise welfare risks
5 Attitudinal effects on the welfare of livestock throughout the value chain	The effects of the attitudes of stockpeople, animal handlers and animal owners on the welfare of their animals The effects of attitudes to animal welfare on consumer and community behaviour Effective communication between industry and the community	Animal welfare practices are aligned with customer and community expectations
6 Education, training and extension	Education, training and extension strategies are developed and implemented to deliver animal welfare R&D outcomes Strategies are developed to enhance the uptake and delivery of R&D through integrated extension and communication initiatives Animal handling and other industry training tools are developed to encourage practice change High quality undergraduate, post-graduate and post-doctoral programs in animal welfare are developed to ensure students entering the animal industries are well placed to deliver sound, scientific advice Education programs are developed and provided to the general community and schools on animal welfare that better educate people on animal welfare practices and issues	Education, training and extension strategies are developed and implemented to deliver animal welfare R&D outcomes. Industry, government and the community are better educated in animal welfare

13. IMPLEMENTATION: THE NAWRDE STRATEGY COMMITTEE

The NAWRDE Strategy Committee will focus primarily on the following 6 high level tasks:

1. DETERMINING AND RANKING RD&E PRIORITIES FOR FUTURE INVESTMENT AND COLLABORATION

The Strategy provides a co-ordinated, national approach to setting strategic priorities for animal welfare RD&E which will address the issues currently impacting industry and Government. To determine RD&E priorities within the defined RD&E themes and focus areas for this Strategy, Committee members will report on their organisations' current RD&E activities, priorities and the Sector Specific Strategy priorities to identify potential areas for collaboration.

The Committee will focus on those animal welfare RD&E priorities that are cross sectoral in nature, are of national significance and that warrant co-investment or collaboration. This cross sector Strategy will therefore complement the Sector Specific Strategies that are focussed on production-related livestock sector RD&E. This Strategy will provide the 'over-arching framework' to summarise 'what is happening' across the sectors in relation to each animal welfare theme and focus area. To facilitate linkages across strategies, industry members of the Animal Welfare RD&E Committee will provide direct communication with other Strategy forums and will allow the Committee to:

- Identify cross sector priorities
- Identify individual sector priorities that might relate to other industries
- Identify capability required to deliver on these priorities

Projects might include those issues that impact on either an individual industry or multiple industries or issues that would benefit from a national focus and/or collaboration and that would otherwise not be effectively addressed. The process will facilitate information exchange and encourage collaboration across the broad RD&E themes for this Strategy.

2. CONDUCTING ANNUAL REVIEW OF ANIMAL WELFARE RD&E THEMES, FOCUS AREAS AND PRIORITIES

The Committee will review the animal welfare RD&E priorities, themes and focus areas and agree on priorities for the coming year. Representatives will provide input and communicate outcomes from their Sector Strategy and/or organisational planning processes as appropriate.

3. NEGOTIATING COLLABORATION AND/OR CO-INVESTMENT OPPORTUNITIES

The NAWRDE Committee will develop strategies to give RD&E providers the greater funding certainty they are looking for, while retaining flexibility for the RD&E investors to address emerging animal welfare issues and retain control of how their resources are used.

The Committee is the vehicle for the parties to come together to review priorities and, as appropriate, reach agreement on the funding and conduct of specific research activities. In this way, the parties will use the Strategy to deliver direct partnerships and long term commitments, thus ensuring that the key capability required by government and industry is retained and developed for the future.

In addition, Government and industry investors will also work together within the Strategy to identify further opportunities for collaboration and co-investment. Arrangements may vary from single RD&E investor and provider partnerships to co-investment agreements between multiple investors and the core providers for large, cross sectoral programs.

These collaborations may be at the national or international level and include local (state) and regional projects.

4. REVIEWING CAPABILITY, INFRASTRUCTURE AND INVESTMENT NEEDS TO DELIVER THE RD&E PRIORITIES

The Committee, upon identifying RD&E priorities, will examine available capability to deliver these priorities. Gaps in capability and resources will be identified and strategies established towards improving collaboration, resource sharing and investment so that the identified RD&E priorities can be delivered.

To support this process, the Committee will collectively review the available capability, infrastructure and investment against the most recent audit findings on an annual basis. This review will provide a 'benchmark' against the audit findings and enable the Committee to identify any gaps and/or changes in capability and resources over time. There is further capability identified within the Sector Specific Strategies that can and will, be utilised for animal welfare RD&E activities. Therefore establishing regular communication and linkage with the Sector Specific Strategies for the review process will be necessary.

Evaluation

In addition to the above annual review of capability and resources against identified RD&E priorities, the Committee will evaluate this Strategy on a 5 year basis. The purpose of this more formal evaluation will be to assess the effectiveness of the Strategy in delivering its stated aims. Evaluation criteria will examine RD&E outcomes to determine if they:

- Remain high quality and address the evidence needs of organisations, in terms of performance and return on investment;
- Keep pace with industry's changing needs over time and each participating organisations goals;
- Have resulted in achievement of the stated goals and contributed to improvements;
- Are shared and transparent in terms of publications and that arrangements enable innovation and implementation.

Measures of success for this Strategy, both within the contributing organisations and collectively at the national level, will include:

- Assessing the number of collaborative arrangements established for the provision of RD&E;
- Assessing the number of shared, cross industry investments in animal welfare RD&E;
- Examining the annual benchmark of capability, infrastructure and investment to determine whether utilisation and application of resources has improved and whether current gaps in capability have been addressed;
- Examining the impact of the RD&E outputs in terms of meeting industry and Government needs, including underpinning policy.

5. CO-ORDINATING, COMMUNICATING AND PROMOTING RD&E THEMES, PRIORITIES AND OUTCOMES

The Committee will have a considerable role in co-ordinating, communication and promoting this Strategy and its outputs. The Committee will direct the Executive Officer to coordinate communications with the Sector Specific Strategies with representatives of the RDCs, State Governments and RD&E providers on the Committee and additionally, through specific

communication activities including the provision of regular updates on the progress of the Strategy to these other RD&E Strategy forums and to policy makers.

6. ESTABLISHING NATIONALLY COORDINATED APPROACHES TO ANIMAL WELFARE EXTENSION AND EDUCATION.

Education and extension are important in delivering research outcomes and contributing to a balanced and well informed debate. The industries and Governments will need to continue providing sound, science-based educational information on animal welfare to customers and the community in order to ensure a balanced discussion, in particular as welfare issues may be either real or perceived. Adaptive development is a critical step for the effective application of animal welfare science, including commercial application of any livestock management, housing or husbandry practices and alternatives, before any change or improvement can be fully realised by the industry.

The approach to animal welfare extension will need to be integrated with the approaches of the Sector Specific Strategies. The Committee will assess the extension arrangements proposed for each of the Sector specific strategies to determine opportunities for integrating animal welfare, identify opportunities for co-investment and/or collaboration and develop an agreed and national approach to delivering animal welfare extension and education.

14. IMPLEMENTATION: THE ANIMAL WELFARE RD&E FORUM

The Annual Animal Welfare RD&E Forum will focus primarily on the following 4 high level tasks:

1. CONTRIBUTE, VIA AN ANNUAL WORKSHOP OR OTHER MECHANISM, TOWARDS THE DETERMINATION AND RANKING OF RD&E PRIORITIES FOR FUTURE INVESTMENT AND COLLABORATION

The RD&E providers will, through a joint annual workshop with the Committee, contribute to the establishment of RD&E priorities for this Strategy. This will enhance the opportunity for dialogue between investors and providers and additionally, improve the coordination and linkage with the RD&E provider organisations involved in this, and other RD&E Strategies.

2. CONTRIBUTE TO ANNUAL REVIEW OF CAPABILITY, INFRASTRUCTURE AND INVESTMENT NEEDS TO DELIVER RD&E PRIORITIES

As part of the annual review of capability and resources, the Committee will seek information from the forum. The forum will contribute to benchmarking capability and resources, as well as identifying capability gaps and needs to deliver on the identified RD&E priorities. This process will enhance the ability of the RD&E provider organisations to forward plan and be more dynamic in the manner by which they consider their available capability, investment in post-graduate programs and future succession planning arrangements.

3. IDENTIFY OPPORTUNITIES FOR IMPROVING COLLABORATION AND PARTNERSHIP BETWEEN RD&E PROVIDERS

Existing collaboration between RD&E providers range from those at an individual project level to formal agreements and for short, medium and long term activities or outcomes. A more strategic approach to enhancing collaboration across providers will help to build critical mass and improve capability across specialist disciplines and with specific industry experience.

Although formal collaborative arrangements already exist amongst some animal welfare RD&E providers, there is ample scope for increased resource use efficiency through further collaboration.

4. IMPROVE COMMUNICATION, DELIVERY AND IMPLEMENTATION OF RD&E OUTCOMES WITHIN THE LIVESTOCK INDUSTRIES

The Forum will work cooperatively with the Committee to improve on current delivery mechanisms for RD&E. Specifically, the Forum and the Committee will consider strategies towards gaining

greater ownership and implementation of RD&E outcomes within the livestock industries. This interaction will improve the understanding across RD&E providers of the commercial and practical challenges facing the livestock industries in RD&E, as well as improve the ability to communicate and promote the outcomes of RD&E to the industries. The Animal Welfare RD&E Forum will also have a joint role in promotion and communicating RD&E activities and outputs – specifically in promoting ‘critical mass’ and science capability nationally and internationally.

15. CONSULTATION AND APPROVALS

Endorsement will be sought for this revision to the Strategy from the Research & Innovation Committee (R&I) which is an Advisory Committee to the Agriculture Senior Officials Committee (AGSOC).

16. COMMENCEMENT

It is agreed that the implementation phase of this revision to the Strategy will commence, following its endorsement, during July 2017.

17. WORKPLAN

The Strategy will continue to evolve over time, with regular updates on these activities provided to the R&I Committee.

PROJECTS COMPLETED UNDER THE STRATEGY

1. *'National Primary Industries Animal Welfare RD&E Forum'*

An annual event which brings together RD&E providers, funders and Governments which are not represented on the Strategy Committee. The Forum aims to encourage networking between funders and providers of primary industry animal welfare RD&E and to foster a collaborative approach in project development.

2. *'National Animal Welfare RD&E Project Register'*

An ongoing project which collates animal welfare RD&E carried out in the Australian livestock sector. Projects are collated and presented at the annual Forum.

3. *'Toolkit to Guide Livestock Animal Welfare Contingency Planning'*

This project delivered a business contingency planning toolkit to assist livestock businesses to develop a single plan encompassing all risks and hazards to their business with the emphasis on managing an on-farm animal welfare crisis situation. An Implementation Plan as well as a Promotional Plan was developed that included generic and industry specific promotional documentation and farmer educational material.

4. *'Livestock Animal Welfare RD&E: Capability and gaps analysis'*

This project delivered a capability and gaps analysis of primary industries animal welfare Research, Development and Extension (RD&E) in Australia.

5. *'Australian animal Welfare Views'*

This project developed and tested a web-based forum that can be used to address specific issues. This output of this project will assist in identifying current or future issues surrounding a particular topic. Observing and measuring the discussion within groups can also assess the amount of divergence across stakeholders.

6. *'Novel markers of pain in animals'*

This project produced a comprehensive literature review focusing on advances in the measurement of pain in animals and humans.

7. *'Assessing the Welfare of Farm Animals - Development and Implementation of a Unified field Index'*

This project undertook a comprehensive analysis of the scientific literature on welfare measures and assessment methods to identify the most credible scientific measures that could be developed into a uniform field index and recommended where further research to validate welfare concepts and methodologies is required.

8. *'Monitoring public attitudes – Development of a monitoring scheme to inform animal welfare policy'*

This project examined the community's attitudes towards and knowledge of livestock management practices, explored levels of trust in the livestock industries and investigated the extent to which demographics, attitudes, trust and knowledge are related to community behaviours. The project also sought to identify opinion leaders and their characteristics in terms of demographics, attitudes, levels of trust and behaviours.