

National Beef Production RD&E Strategy

Acknowledgments

The National Beef Production Research, Development and Extension Strategy was developed under the auspices of the Primary Industries Standing Committee, Research and Development Subcommittee on behalf of the Primary Industries Ministerial Council.

Development of the Strategy has been led by staff from Department of Employment, Economic Development and Innovation (Qld) together with Meat & Livestock Australia, working with members of the Red Meat Co-investment Committee.

– Content has been developed with contributions from:

- Australian Government Department of Agriculture, Fisheries and Forestry
- Charles Sturt University
- Commonwealth Scientific and Industrial Research Organisation
- Cooperative Research Centre for Beef Genetic Technologies
- Department of Agriculture and Food Western Australia
- Department of Employment, Economic Development and Innovation
- Department of Primary Industries Victoria
- Griffith University
- Industry & Investment NSW
- James Cook University
- La Trobe University
- Meat & Livestock Australia Limited
- Murdoch University
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- Tasmanian Department of Primary Industries, Parks, Water and Environment
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- University of Southern Queensland
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The Red Meat Co-investment Committee

The Red Meat Co-investment Committee (RMCIC) had its origins in the combined Meat & Livestock Australia (MLA)–Departments of Primary Industries (DPIs) Co-investment Committee. The RMCIC was formed in 2005 to improve strategic alignment of production research, development and extension (RD&E) investments in the red meat industries.

In the same year, state ministers for primary industries and the Australian Government endorsed a National Primary Industries Research, Development and Extension Framework (National RD&E Framework) that sought to engender national collaboration across a range of agricultural industries by publicly funded RD&E agencies. MLA and the other rural Research and Development Corporations (RDCs) were asked to join this initiative in 2007.

These parallel processes resulted in the MLA–DPIs Co-investment Committee gaining responsibility for developing and implementing the strategies for both beef and sheepmeat production RD&E under the National RD&E Framework, with the committee subsequently augmented to include representation from the:

- Commonwealth Scientific and Industrial Research Organisation
- Cooperative Research Centre for Beef Genetic Technologies
- Cooperative Research Centre for Sheep Industry Innovation
- Australian Government Department of Agriculture, Fisheries and Forestry
- member faculties of the Australian Council of Deans of Agriculture.

The MLA–DPIs Co-investment Committee was subsequently renamed the Red Meat Co-investment Committee in 2008 to reflect its expanded membership and responsibilities.

The broad national membership of the RMCIC ensures that the National Beef Production Research, Development and Extension Strategy (the Strategy) has strong links to Australia’s major publicly funded RD&E providers and, through MLA, to key industry decision makers with interests in RD&E.

The RMCIC will have an ongoing role in facilitating implementation of the Strategy and the operational interactions between its members. Its ultimate aim is to achieve better outcomes for industry from the available RD&E resources.

Contents

Acknowledgments.....	1
Abbreviations and acronyms.....	5
Executive summary	7
1 Introduction.....	9
2 Situation analysis	13
2.1 Industry size and value	13
2.2 Structure and production systems.....	16
2.3 Productivity	17
2.4 Industry prospects.....	19
3 Industry research, development and extension investment priorities.....	20
3.1 Vision	20
3.2 Identifying industry priorities.....	20
3.3 State agency priorities	23
3.4 Linkage to other strategies.....	25
4 Capability, infrastructure and intellectual property	27
4.1 Capability	27
4.2 Infrastructure and intellectual property	30
4.2.1 Livestock and pasture resources and databases	30
4.2.2 Pastures and plant genetic resources	32
4.2.3 Other forms of intellectual property.....	32
5 New processes for collaborative investment	Error! Bookmark not defined.
5.1 Evaluation and prioritising of investment Error! Bookmark not defined.	
5.2 National program coordination and development Error! Bookmark not defined.	
5.3 Mechanisms to monitor and address gaps in capability and infrastructure..... Error! Bookmark not defined.	
5.4 Prioritising infrastructure for future investment Error! Bookmark not defined.	
5.5 Succession planning	Error! Bookmark not defined.
5.6 Maintaining the competitive funding element at the project level Error! Bookmark not defined.	

5.7	National communication development and extension	Error! Bookmark not defined.
5.8	Funding models and agreements	Error! Bookmark not defined.
5.9	Monitoring and evaluation	Error! Bookmark not defined.
5.10	Next steps	Error! Bookmark not defined.
Appendix A	Regional industry priorities and derived national priority industry outcomes.....	Error! Bookmark not defined.
Appendix B	Beef production research, development and extension capacity	Error! Bookmark not defined.
Appendix C	Postgraduate and undergraduate students	Error! Bookmark not defined.
Appendix D	Consolidated infrastructure and research herd data	Error! Bookmark not defined.
Appendix E	First-pass evaluation and investment analysis process	Error! Bookmark not defined.

Abbreviations and acronyms

ABARE	Australian Bureau of Agricultural and Resource Economics
ASRC	Australian Standard Research Classification
Beef CRC	Cooperative Research Centre for Beef Genetic Technologies
CCA	Cattle Council Australia
CD&E	communication, development and extension
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSU	Charles Sturt University
DAFWA	Department of Agriculture and Food Western Australia
DEEDI	Department of Employment, Economic Development & Innovation (Qld)
DPIs	departments of primary industries
DPIV	Department of Primary Industries Victoria
DREAM model	Dynamic Research Evaluation for Management model
FTE	full-time equivalent
I&I NSW	Industry and Investment NSW
JCU	James Cook University
MLA	Meat & Livestock Australia Limited
MISP	Meat Industry Strategic Plan
MSA	Meat Standards Australia
MWG	Modelling Working Group
NABRC	North Australia Beef Research Council
NFI	net feed intake
NSW	New South Wales
NT	Northern Territory
NTDR	Northern Territory Department of Resources
PIMC	Primary Industries Ministerial Council
PIRSA	Department of Primary Industries and Resources of South Australia
PISC	Primary Industries Standing Committee
Qld	Queensland
RD&E	research, development and extension
RDC	Research and Development Corporation
RMAC	Red Meat Advisory Council Ltd
RMCIC	Red Meat Co-investment Committee
SA	South Australia
SABRC	Southern Australia Beef Research Council
Sheep CRC	Cooperative Research Centre for Sheep Industry Innovation
Tas	Tasmania
The Strategy	The Beef Production Research Development and Extension Strategy
TIAR	Tasmanian Institute of Agricultural Research
UQ	University of Queensland;
UNE	University of New England
USQ	University of Southern Queensland
UTAS	University of Tasmania
UWA	University of Western Australia
UWS	University of Western Sydney
vet	veterinary science
Vic	Victoria
WA	Western Australia

Executive summary

The National Beef Production Research, Development and Extension (RD&E) Strategy, (the Strategy) has been developed at the request of the Primary Industries Ministerial Council (PIMC), and follows the submission of a first draft strategy to the Primary Industries Standing Committee (PISC) R&D Subcommittee in March 2009.

The lead agencies for developing the Strategy are the Queensland Department of Employment, Economic Development and Innovation (DEEDI) and Meat and Livestock Australia (MLA). The leadership roles of both organisations were determined on the basis of the significant interests they oversee in beef production on a national scale.

In developing the Strategy, MLA and DEEDI have worked with all the other organisations represented on the Red Meat Co-investment Committee (RMCIC) to develop and collate information on the relative (industry) demand for, and (agency) supply of, beef RD&E resources (including personnel and infrastructure) across Australia. The RMCIC has overseen the development of the principles and processes for identifying and reallocating RD&E resources in line with future investment priorities.

– These priorities have been identified and developed in consultation with beef producers, industry RD&E consultative entities (the North and Southern Australia Beef Research Councils) and the Cattle Council of Australia (CCA). Collectively, the consultation processes and entities have been used to develop:

- ten Priority Industry Outcomes, incorporating the regional and national needs of industry
- seven strategic imperatives that align with Australian Government, state and territory governments RD&E priorities and those prescribed within the Meat Industry Strategic Plan (MISP) 2010–2105
- proposed RD&E programs and deliverables for further assessment and consideration by the RMCIC.

– The Strategy has the formal support of all the government agencies and CSIRO represented at RMCIC, and describes the implementation of new processes that will guide investment in the beef RD&E sector in the future. These processes provide for collaborative approaches to:

- stakeholder assessment of investment priorities
- ex-ante investment analysis and ex-post evaluation
- program development, initiation and management
- maintaining critical infrastructure and IP
- maintenance and development of human capacity.

– The outcomes from implementing these new approaches to RD&E will be:

- better coordinated RD&E investment that aligns with industry and government priorities
- increased efficiency in resource use and retention of key resources and infrastructure
- development of, and succession planning for retaining key human resources to address current and future priorities
- identification, retention and national coordination of critical intellectual property in terms of research herds, animal samples and databases.

The processes described in this strategy provide new mechanisms for government, MLA, universities, CSIRO and the Cooperative Research Centre for Beef Genetic Technologies (Beef CRC) to share information and make collaborative investments on behalf of industry, government and other RD&E providers. The linkage to sheepmeat RD&E investment through the RMCIC will also ensure that appropriate resource and information sharing and co-investment occurs between the two red meat industries. Linkages with other sectoral and cross-sectoral plans have also been identified.

These investment processes are not directly relevant to all the RD&E investment processes currently used in the beef processing, feedlot and live export sectors. Nevertheless, the intention is to further develop this strategy to encompass RD&E relevant to the whole beef supply chain in the near future.

1 Introduction

In 2005, the National Primary Industries Research, Development and Extension Framework (National RD&E Framework) was endorsed by the Australian Government, and all states and territories, supporting a model of national research, regional development and local extension for a range of industries and cross-sectoral themes. The National RD&E Framework recognised that basic and strategic research can be provided from a distance, along with regional adaptive development and local extension, to improve the rate of innovation by industry.

PIMC called for the National Beef Production Research, Development and Extension Strategy (the Strategy) to be developed for consideration in April 2010. DEEDI (Qld), has been allocated the lead role in this process. MLA is the supporting Research and Development Corporation. The development of the Strategy has been facilitated through the RMCIC whose membership includes MLA, state agencies, CSIRO, the Beef CRC, the Cooperative Research Centre for Sheep Industry Innovation (Sheep CRC) and representatives of the university sector. The Cattle Council of Australia (CCA) has also been closely involved with the development of the Strategy.

– The aims of the Strategy are to:

- improve the focus, efficiency and effectiveness of beef production RD&E across Australia, and reduce fragmentation and duplication of effort
- create a system of beef production RD&E that better integrates the priorities of industry and industry organisations, investors, federal, state and territory governments, CSIRO, the Beef CRC, universities, and private providers for industry, stakeholder and community benefit
- enhance beef production RD&E capability through increased collaboration, specialisation and critical mass as appropriate, and generate greater national benefits from large infrastructure investments
- provide a beef production RD&E system that is supportive of, and responsive and accountable to, industry needs and which delivers integrated and accelerated industry development.

– This document provides a strategic framework and process plan for national collaboration by state, territory and Australian government departments, MLA, universities, CSIRO and the Beef CRC in beef production RD&E. It sets out the process by which agencies and institutions with an interest in beef production RD&E will invest and work collaboratively in the future. This process will provide greater efficiency of resource use by:

- avoiding duplication of effort
- identifying and prioritising critical infrastructure required for beef production RD&E
- maintaining and nurturing human resource capability.

– The Strategy further develops the principles for developing a National RD&E Framework set out in the Statement of Intent signed by all PIMC members and the Rural Research and Development Corporations (RDCs), namely:

- a) The Parties will cooperate to encourage the establishment of a more efficient and effective RD&E system nationally.

- b) Recognising that the Parties will be subject to budget fluctuations, the Parties will endeavour to at least maintain RD&E funding levels for primary industries; and investments, including from savings, should be re-directed to improve the capability of primary industries RD&E in priority areas.
 - c) The Parties will share information, plans and priorities for investment in RD&E to facilitate development and implementation of the Framework.
 - d) The Parties will facilitate access to national research capability (people, infrastructure and information) by industry and R&D partners across Australia, including the private sector.
 - e) The Parties will support processes to refresh the rural R&D priorities and to encourage more consistent and rigorous monitoring of performance of R&D targeting and delivery.
 - f) The Parties recognise the importance of investing in extension of R&D to facilitate rapid uptake of research and innovation, and the increasing role of the private sector.
 - g) The Parties agree to work cooperatively to improve the administrative processes and effectiveness of information sharing and management.
 - h) The Parties agree to freely share the knowledge generated through the primary industries National RD&E Framework, including minimising barriers to RD&E created by intellectual property protection.
 - i) The Parties will monitor, evaluate and report on the performance of the National RD&E Framework and the sector and cross-sector strategies developed and implemented under the Framework.
- The Strategy has also been aligned with the relevant components of the Meat Industry Strategic Plan 2010–2015, released in October 2009, which contains the following strategic themes:
1. Environment and ethics
Promote ethical and responsible custodianship of the environment, animal welfare and resources used in the production of red meat.
 2. Market access
Maximise, in partnership with government, effective trade facilitation.
 3. Our industry
Promote a single coordinated voice for our industry to reshape and reinvigorate relationships within industry and with government.
 4. Our people
Develop and retain motivated and appropriately skilled people for our industry.
 5. Innovation
Increase competitiveness and profitability through innovation.
 6. Marketing and promotion
Focus on the consumer to continue to achieve profitable growth in demand for Australian red meat and livestock products.
 7. Economics and infrastructure
Foster economic reform and infrastructure investment to enhance the capabilities of our industry.

Some work has been done to align this production sector plan with the processing, feedlot and live-export sectors, but further efforts are required to complete this.

The Strategy will provide a mechanism for the beef industry to retain an effective and efficient RD&E capability. This will support the production sector to innovate and respond to the growing demand for beef, despite pressures on government budgets and human resources.

Meat Industry Strategic Plan 2010–2015

The Meat Industry Strategic Plan (MISP) 2010–2015 represents a single view of the Australian red meat and livestock industry and provides a high-level roadmap for RD&E, marketing and policy investments across the whole red meat supply chain for the period 2010–2015.

The plan was developed by the Red Meat Advisory Council Limited (RMAC), which has custodianship of the MISP planning and implementation process. RMAC comprises five of the six peak industry councils of the red meat and livestock industry:

- Australian Livestock Exporters Council
- Australian Lot Feeders' Association
- Australian Meat Industry Council
- Cattle Council of Australia
- Sheepmeat Council of Australia.

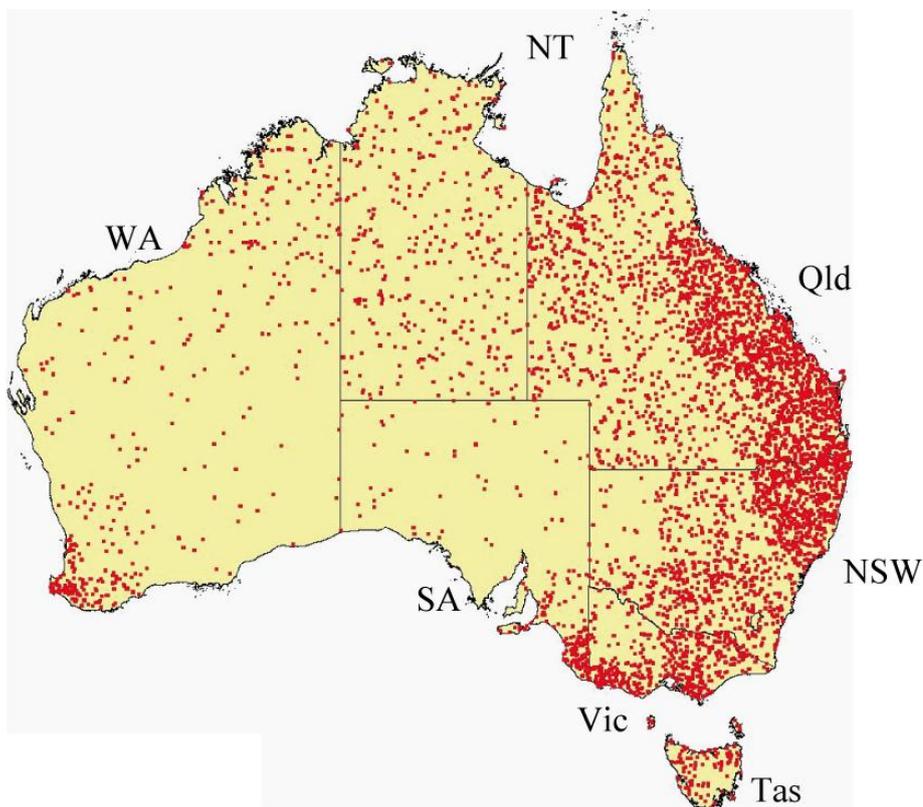
The Goat Industry Council of Australia, although involved in the red meat industry, is not a member of RMAC. The MISP is now into its third major iteration — the foundation plan (MISP 1) was developed by industry in 1996.

2 Situation analysis

This section provides an overview of the beef industry in Australia, including the industry size and value, structure and production systems, productivity and industry prospects.

2.1 Industry size and value

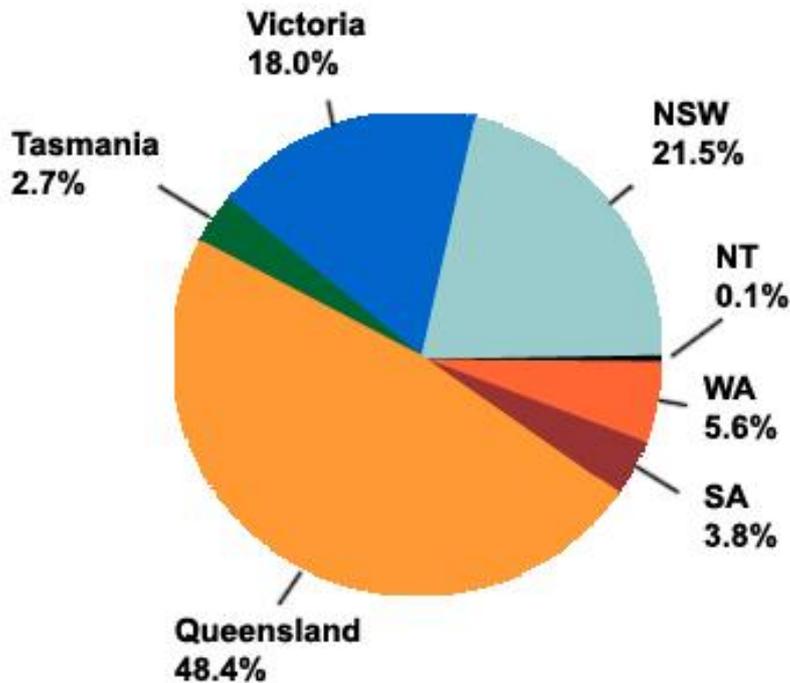
The Australian beef industry has the largest geographical footprint of all broadacre industries, occupying 332 million hectares (43 per cent) of the country's land mass and having a strong presence in all states and territories (Figure 2.1). In June 2008, there were 27.3 million cattle in Australia, 44 per cent of which were in Queensland.



Source: Australian Bureau of Statistics

Figure 2.1 Distribution of beef cattle by state and territory (million head) (2008)

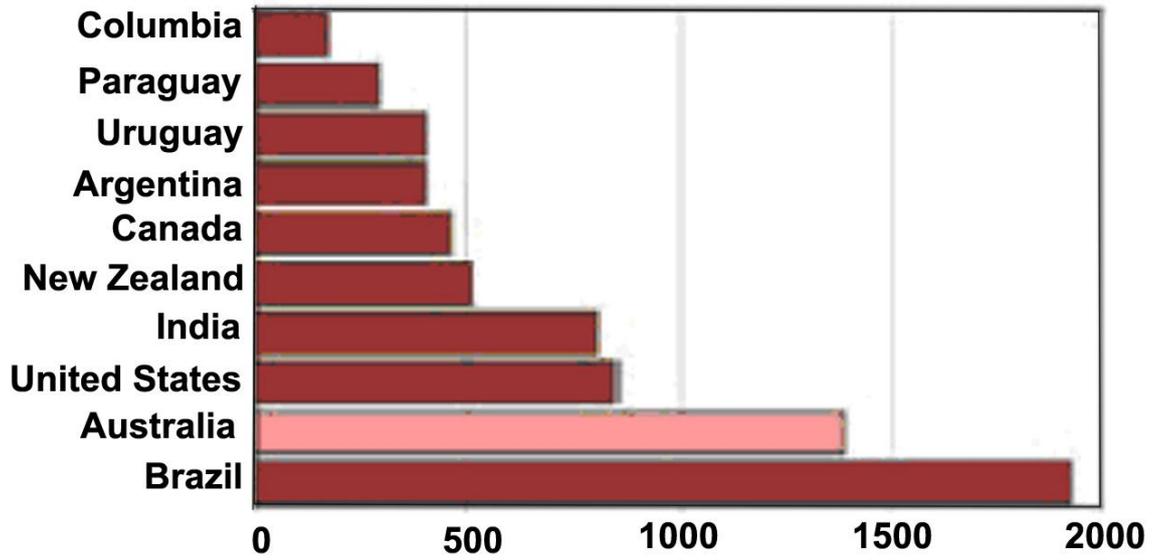
Total beef and veal production was 2.2 million tonnes in 2008–09 (Figure 2.2) with a farm-gate value of \$8 billion. Beef exports in that year were distributed to more than 100 countries and totalled 968,000 tonnes (A\$5052 million free-on-board [FOB] value), making Australia the second largest beef exporter in the world (Figure 2.3). With live cattle exports reaching 891,000 head, valued at A\$646 million, beef and beef cattle are Australia’s most valuable agricultural export commodity.¹



Source: Australian Bureau of Statistics

Figure 2.2 Australian beef and veal production, 2.2 million tonnes cwt (2007–08)

¹ MLA (Meat & Livestock Australia) (2009). *Cattle industry projections — mid year update*, MLA, Canberra.



cwt = carcase weight
 a Includes processed meat
 Source: United States Department of Agriculture (2008)

Figure 2.3 Top ten beef-exporting countries^a, '000 tonnes cwt (2008)

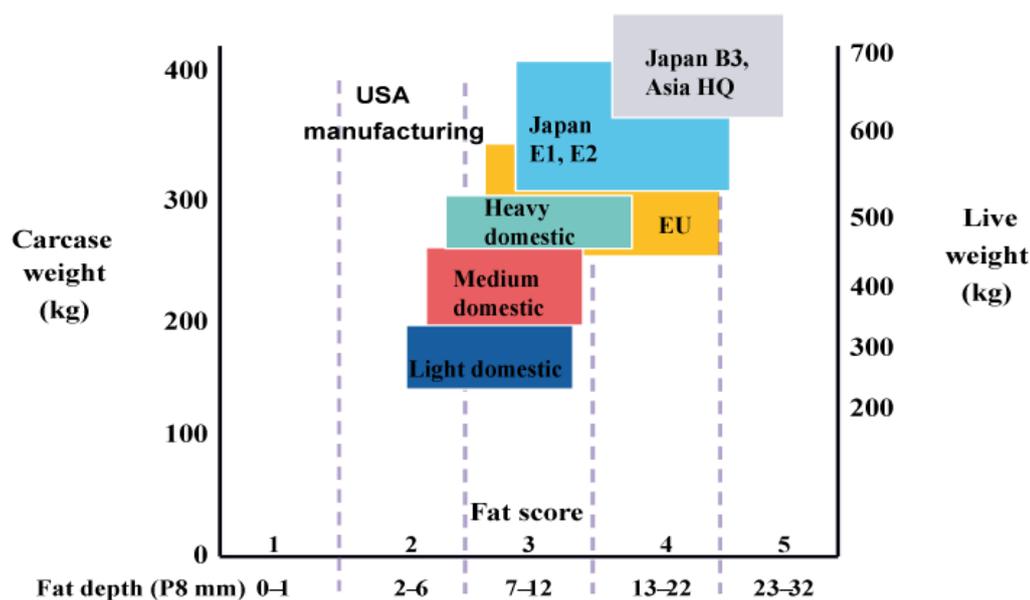
2.2 Structure and production systems

The beef industry employs more than 220,000 people at the farm, processing and retail levels. There are nearly 43,000 commercial beef properties in Australia (>100 head), with the largest 27 per cent of those carrying 79 per cent of the total beef herd. The scale of production is a particular feature in northern Australia, where the largest 17 per cent of properties carry 71 per cent of the region's beef herd.²

The industry is characterised by a wide range of farm sizes and production systems. In the extensive rangelands of Australia, producers generally have large properties and production is based mainly on the grazing of native pastures. In intensive production regions, properties are generally smaller in area and the grazing of cattle is usually part of a mixed enterprise (crops and other livestock) with a greater reliance on introduced pastures and forage crops.

In area terms, grazing is the most widespread form of land use in all Australian states and territories. In the extensive rangelands of central and northern Australia, where few alternative income-generating forms of land use exist, grazing systems provide a particularly important source of income, as well as environmental stewardship over vast tracts of sparsely populated land.

The beef industry can and does target a wide range of products and market outlets, which is testament to the diverse range of climates within which Australian beef is produced and the different requirements of destination markets. These range from light carcasses of less than 200 kilograms for the domestic market to the long-fed carcasses demanded by Japanese markets of more than double that weight (Figure 2.4).



kg = kilogram; mm = millimetre

² ABARE (Australian Bureau of Agricultural and Resource Economics) (2009). *Australian beef 09.1: financial performance of beef farms, 2006–07 to 2008–09*, ABARE, Canberra.

Figure 2.4 Beef market specifications for slaughter cattle

2.3 Productivity

Total factor productivity (TFP) measures outputs relative to the total inputs used to produce the output. Between 1977–78 and 2005–06, TFP of the Australian beef industry grew by an average of 1.5 per cent per annum.³ This is on par with productivity growth in mixed crop–livestock systems and average overall TFP for all broadacre industries (Table 2.1).

Table 2.1 Broadacre agricultural total factor productivity, input and output growth (1977–78 to 2005–06)

	TFP growth (%)	Output growth (%)	Input growth (%)
Total broadacre	1.5	0.8	-0.6
Cropping	2.1	3.1	1.0
Mixed crop–livestock	1.5	0.1	-1.5
Beef ^a	1.5	1.7	0.1
Sheep	0.3	-1.4	-1.8
Dairy ^b	1.2	5.1	3.9

TFP = total factor productivity

a Includes farms mainly engaged in beef cattle and beef–sheep production

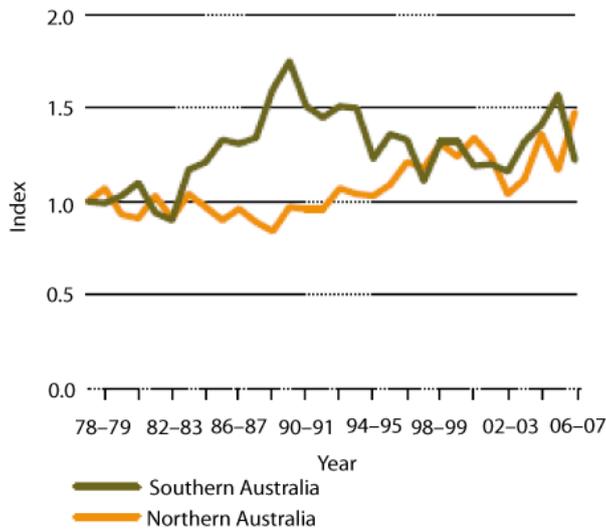
b Dairy industry estimates are for the period 1988–89 to 2006–07

Source: ABARE (2009)³

Over the past decade, northern Australia has attained higher levels of overall productivity growth than southern Australia (Figure 2.5), due mainly to the significant expansion of beef and live cattle output in northern Australia over this period.

Total factor productivity is highly variable in all of Australia’s broadacre and dairy industries, with shorter-term (year-on-year) variability in productivity being a feature of both the northern and southern beef industries (Figure 2.5 on the following page). In the north, this is often a function of scale, whereby higher efficiencies, including in production, are often achieved on larger properties. In southern Australia, variability is also a function of the smaller and more diverse nature of the agricultural enterprises in that region.

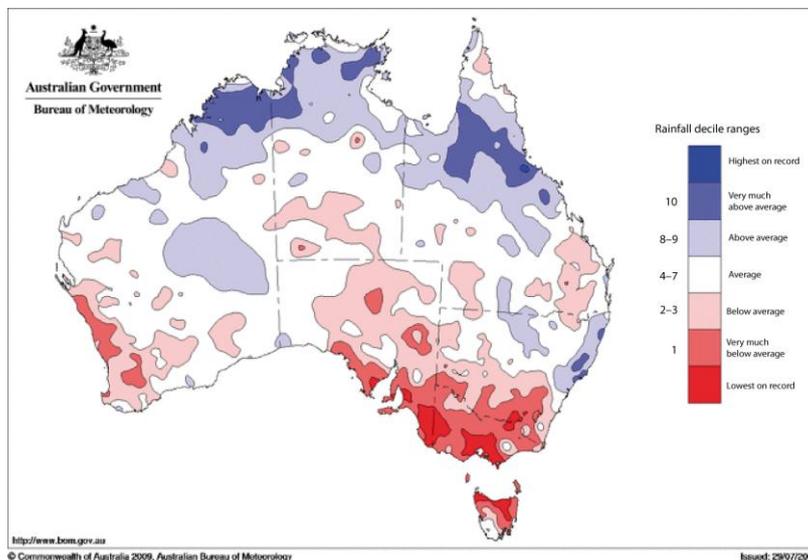
³ ABARE (Australian Bureau of Agricultural and Resource Economics) (2009). *Australian beef 09.1: financial performance of beef farms, 2006–07 to 2008–09*, ABARE, Canberra.



Note: 1977-78 = 1.0
 Source: ABARE (2009)⁴

Figure 2.5 Total factor productivity growth in specialist beef producers (2009)

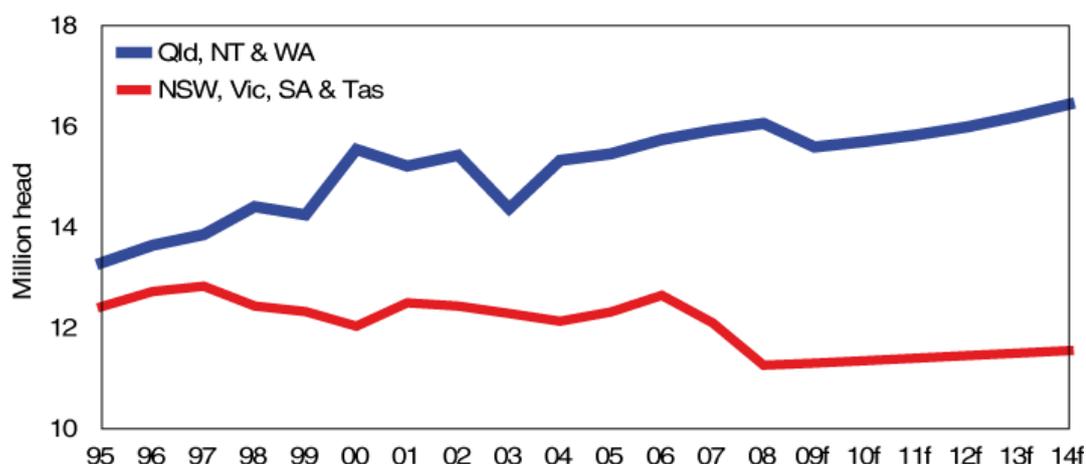
More recently, the high severity and frequency of drought conditions (Figure 2.6) have impacted significantly on agricultural productivity in southern Australia. This, and ever-increasing competition for land use in many southern agricultural regions, has contributed to a reduction in beef production in southern Australia. Conversely, better seasonal conditions, lower costs of land resources, the uptake of improved management practices and technologies, and the decline of the sheep industry have seen beef production in the north expand (Figure 2.7) on the following page.



Note: Distribution based on gridded data
 Source: National Climate Centre, Bureau of Meteorology (2009)⁵

⁴ ABARE (Australian Bureau of Agricultural and Resource Economics) (2009). *Australian beef 09.1: financial performance of beef farms, 2006-07 to 2008-09*, ABARE, Canberra.
⁵ www.bom.gov.au

Figure 2.6 Australian rainfall deciles, July 2006 to June 2009



f = forecasts

Note: As at 31 March 1995 to 1999; as at 30 June 2000 to 2014

Source: Australian Bureau of Statistics; MLA forecast (2009)⁶

Figure 2.7 Geographical distribution of beef cattle, 1995–2014

Continued productivity growth is required in the beef industry to offset declining terms of trade and to maintain and improve profitability. RD&E to support such growth is critical.

2.4 Industry prospects

The medium to long-term prospects for the Australian beef industry are undoubtedly strong. The domestic market is highly valuable, and is growing and reliable. Over the past decade, and especially in recent years, the Meat Standards Australia (MSA) grading scheme has successfully underpinned a positive shift in beef-eating quality in Australia, and a strengthening of domestic demand and expenditure. In 2008–09, domestic expenditure on beef approximated A\$6.4 billion, up from A\$5 billion in 2002–03. Per capita beef consumption now stands at around 32.5 kilograms per year in Australia.

Export demand for Australian beef is also forecast to grow, particularly with the growth in disposable incomes in Asian markets, for which Australia is well placed to take advantage. Fall-out from the global financial crisis continues to affect exports, but recovery is already occurring in some outlets. Recent and unprecedented volatility in the Australian dollar, and its present high value, are major factors mitigating against rapid recovery in export markets.

Ultimately, the prosperity of the industry depends upon continuity of supply and consistency of product. In the short term, supply will be tight. Poor brandings in 2007–08 (due mostly to prolonged and widespread drought) contributed to one million fewer breeding cattle in 2009. This is approximately an 8 per cent decrease from the previous year. It is expected that supply of slaughter cattle will be down by 300,000 early in 2010, with total slaughter in 2010 predicted to be 7.5 million head. A relatively slow rate of herd expansion is expected in 2010, before herd growth resumes in 2011, especially in northern Australia. Localised drought conditions will continue to affect the recovery of the cattle herd overall.

⁶ MLA (Meat & Livestock Australia) (2009). *Cattle industry projections — mid year update*, MLA, Canberra.

3 Industry research, development and extension investment priorities

This section discusses the vision, industry and state agency priorities, and linkages to other agencies that are associated with the beef industry in Australia.

3.1 Vision

– Following industry and government agency consultation, the following vision has been developed for the beef production RD&E strategy:

A competitive and sustainable beef industry, responsive and adaptable to a changing operating environment.

3.2 Identifying industry priorities

Development of an industry plan and the setting of investment priorities require input from producers and processors, in consultation with RD&E organisations that have the capacity to execute the plan. With this as the focus, the Southern Australia Beef Research Council (SABRC), North Australia Beef Research Council (NABRC) and MLA ran four regional consultation forums (Brisbane, Tamworth, Adelaide & Bendigo) during October–November 2008. These forums gathered information on industry priorities for future RD&E. The participants were a mixture of producers, peak body representatives, state and other RD&E agencies and MLA representatives.

– These forums provided the RMCIC with information to develop 10 national industry priority outcomes (Appendix A). From these, seven strategic imperatives that would form the basis for this strategy were formed:

1. Enhancing food safety, product integrity and biosecurity.
2. Increasing natural resource use efficiency and reducing environmental impacts.
3. Increasing cost efficiency and productivity (including adaptability and risk management).
4. Enhancing integration and value adding in supply chains (including cost efficiency).
5. Improving beef eating and nutritional quality.
6. Developing new and existing beef markets.
7. Aligning animal welfare practices with consumer and community expectations.

These strategic imperatives, on which this Strategy is based, and their relationship to the Meat Industry Strategic Plan (MISP) and Australian Government priorities is illustrated in Figure 3.1

AUSTRALIAN RURAL R&D PRIORITIES

- Biosecurity
- Supply Chains & Markets
- Productivity & Adding Value
- Climate variability & climate change
- Natural resource management
- Technology
- Innovation skills

MISP3 THEMES

- Marketing and Promotion
- Innovation
- Environment and Ethics
- Our People

MLA IMPERATIVES

- Growing Demand
- Increasing Market Access
- Increasing productivity across supply chains
- Promoting industry integrity and sustainability
- Increasing industry and people capability

BEEF RD&E STRATEGIC IMPERATIVES

- Enhancing food safety, product integrity and biosecurity
- Improving beef and sheepmeat eating and nutritional quality
- Developing new and existing beef and sheepmeat markets
- Increasing cost efficiency and productivity (including adaptability and risk management)
- Enhancing integration and value adding in supply chains (including cost efficiency)
- Aligning animal welfare practices with consumer and community expectations
- Increasing natural resource use efficiency and reducing environmental impacts

INDUSTRY OUTCOMES

- Domestic and global recognition of best practice food safety and product integrity levels
- Biosecurity practices and programs protecting the industry's reputation and animal health status, and maximising market access
- Beef and sheepmeat eating and nutritional quality that meets target market specifications
- Diversified beef and sheepmeat markets that minimise risk and maximise industry prosperity
- Profitability and productivity at the enterprise level
- Integrated and responsive supply chains that add value to livestock, beef and sheepmeat products
- Beef and sheep production systems aligned with consumer and community expectations for environmental impacts
- Community recognition of industry custodianship for environmental protection, animal welfare and ethical behaviour
- Animal welfare practices aligned with consumer and community expectations
- Beef and sheep enterprises that are resilient and adaptable to changing markets and operating environments



MISP = Meat Industry Strategic Plan; MLA = Meat & Livestock Australia; RD&E = research, development and extension

Figure 3.1 National beef production research, development and extension strategic imperatives and their relationship to other national plans

3.3 State agency priorities

As part of the development of the RD&E Strategies, the PISC R&D Subcommittee have requested that each agency identify whether their organisation will take a ‘major’, ‘support’ or ‘link’ role in beef production RD&E in the future.

- The definitions of major, support and link for the purposes of the Strategy are:
 - major — the agency will take a national lead role by providing significant RD&E effort
 - support — the agency will undertake RD&E, but other agencies will provide the major effort
 - link — the agency will undertake little or no RD&E: instead it will access information and resources from other agencies.

Table 3.1 indicates the priority that each state agency involved in development of the plan places on beef production RD&E. The states intending to take a major role in beef RD&E in the future (Queensland, Northern Territory and New South Wales) also have the largest capability in terms of full-time equivalent (FTE) staff. Agencies indicating a support role also have significant capability currently allocated to the beef production sector.

Table 3.1 Beef production research, development and extension priority in state agencies^a

State agency	Intended role in beef RD&E	FTE capacity in beef — 2009
Primary Industries and Resources South Australia	Support	12.9
Department of Food and Agriculture Western Australia	Support	21.4
Victorian Department of Primary Industries	Support	23.6
Tasmanian Institute of Agricultural Research	Link	4.1
Department of Employment, Economic Development and Innovation Queensland	Major	119.5
Industry & Investment New South Wales	Major	78.5
Northern Territory Department of Resources	Major	28.8
Total		288.8

^a The total capacity in beef RD&E across state agencies, CSIRO and the university sector is 458.8 FTE (Section 4.1).

In developing this plan, each agency has also indicated the relative future priority (high, medium or low) that it places on each of the strategic imperatives within the Strategy.

In Table 3.2, the current FTE capacities for beef production RD&E within each state agency are compared with priorities for investment at the strategic imperative level.

Table 3.2 Strategic imperatives mapped by agency priority and the current full-time equivalent staff capability (2009)

Strategic imperatives	Agency FTE							Total
	PIRSA	DAFW A	DPIV	TIAR	DEEDI (Qld)	I&I NSW	NTDR	
1. Enhancing food safety, product integrity and biosecurity	0.0	0.0	3.4	0.0	8.6	15.9	2.0	29.9
2. Increasing natural resource use efficiency and reducing environmental impacts	0.0	3.7	6.6	1.3	25.6	16.8	11.6	65.6
3. Increasing cost efficiency and productivity (including adaptability and risk management)	11.8	14.1	7.8	2.1	55.0	28.3	13.5	132.6
4. Enhancing integration and value adding in supply chains (including cost efficiency)	0.0	0.0	1.4	0.0	8.1	1.5	0.0	11.0
5. Improving beef eating and nutritional quality	0.3	0.0	0.5	0.1	12.7	5.3	0.0	18.9
6. Developing new and existing beef markets	0.0	0.0	0.5	0.0	4.4	0.3	1.2	6.4
7. Aligning animal welfare practices with consumer and community expectations	0.0	1.4	0.1	0.1	5.1	2.0	0.5	9.2
Other	0.8	2.3	3.3	0.6	0.0	8.4	0.0	15.4
Total	12.9	21.4	23.6	4.1	119.5	78.5	28.8	288.8

FTE = full-time equivalent; RD&E = research, development and extension

■ High priority ■ Medium priority ■ Low priority

Notes: The total capacity in beef production RD&E across state agencies, CSIRO and the university sectors is 458.8 FTE (Section 4.1)

'Other' means that the organisation has the FTE capacity that is engaged in work not covered or described by items 1–7

No shading indicates that the organisation has not placed any priority on that particular strategic imperative

Table 3.2 indicates that, currently, most capability in the state public sector agencies exists within strategic imperatives 2 and 3, which are associated with the efficient use of natural resources and productivity on-farm. This is not surprising, given the importance of sustainable use of resources and productivity in driving the performance of a land-based industry, and the role of government investment in on-farm RD&E and public good outcomes.

Historically, governments have not invested in RD&E further down the supply chain. The table indicates that these two strategic imperatives are considered to be a high priority for the future by these agencies.

3.4 Linkage to other strategies

This Strategy identifies all RD&E activity considered by industry to be a priority for the beef production sector. Many of the programs and deliverables that have been identified for consideration by the RMCIC require investment activities that are the same as or have some relevance to, other sectoral and cross-sectoral plans, such as sheepmeat, wool, animal welfare and climate change.

The Strategy has been developed to provide a complete picture of the requirements of the pre-farm-gate sector. Many of the priorities and programs will be implemented as part of cross-sector and cross-industry investments. These linkages will reduce duplication and increase the efficiency of investment in the future.

Care should be taken not to ‘double count’ capacity and investment intentions between sectoral and cross-sectoral plans.

The cross-sectoral strategies will summarise what is happening across all industry sectors relevant to that topic, identify gaps in investment and ensure collaboration across sectors, where it is appropriate.

North Australia Beef Research Council and Southern Australia Beef Research Council

NABRC and SABRC are the key industry–agency forums with the responsibility for determining and advising on strategic requirements for RD&E activities (including education and training) in the Australian beef industry.

NABRC and SABRC act as the central consultative councils comprising all major northern and southern beef RD&E agencies and educational institutions (departments of primary industries, CSIRO, CRCs and universities) and producer representatives from applicable states and territories. NABRC and SABRC will contribute to overseeing and implementing the processes and policies developed by RMCIC in relation to collaboration, program coordination and monitoring and evaluation for implementation of this Strategy.

NABRC and SABRC have formal linkages to other industry organisations, including CCA and state farm organisations, and provide information and advice to support RD&E policy development by these prescribed bodies. Oversight of the activities of levy-funded service companies, including MLA’s involvement in delivering the objectives of the Meat Industry Strategic Plan (MISP3), is the express responsibility of peak industry councils (including CCA). Therefore, CCA has the overarching authority over MLA’s strategic direction within the Strategy.

4 Capability, infrastructure and intellectual property

This section presents current beef industry capability, infrastructure and intellectual property available to the Strategy.

4.1 Capability

In the preparation of this Strategy, significant effort has been allocated to collecting data that describe the current status of human capacity, infrastructure and beef research herds that exist across the broad spectrum of organisations contributing to the national RD&E effort.

Detailed summaries on an organisational basis are provided in Appendix B for full-time equivalent (FTE) capacity in relation to the Australian Standard Research Classification, employment classification, strategic imperatives and age classification. A snapshot of the national data is provided in figures 4.1–4.3. This information will be used by each RMCIC member organisation to inform their decisions about research capability and its application to investment priorities at the strategic imperative and program levels.

These data represent a new opportunity to integrate reallocation and succession planning activities where appropriate. RD&E resourcing will be an ongoing area of RMCIC consideration under the Strategy, with the aim of increasing efficiency of resource use and ensuring that skills that are scarce are applied to the highest priority RD&E activities. In particular the RMCIC will use this data set in 2010 to consider the effect of short-term and project-based funding on the future supply and development of important research and technical skills. This information will have an influence on actions taken.

The current snapshot of capability prepared for the Strategy indicates that a total of 459 FTEs were engaged in beef production RD&E across the government agencies, CSIRO and universities in 2009. Figure 4.1 on the following page indicates that the bulk of this capacity is in the field of animal production and extension (other) is the second-most prevalent. Smaller capacities exist in the fields of veterinary science, and crop and pasture science. Within the organisations, there is substantial capacity within other scientific disciplines (eg soil and water, biometrics, economics and business) that is not currently allocated directly to beef production RD&E, but could be called upon to address specific issues as required. This capacity is not recorded here.

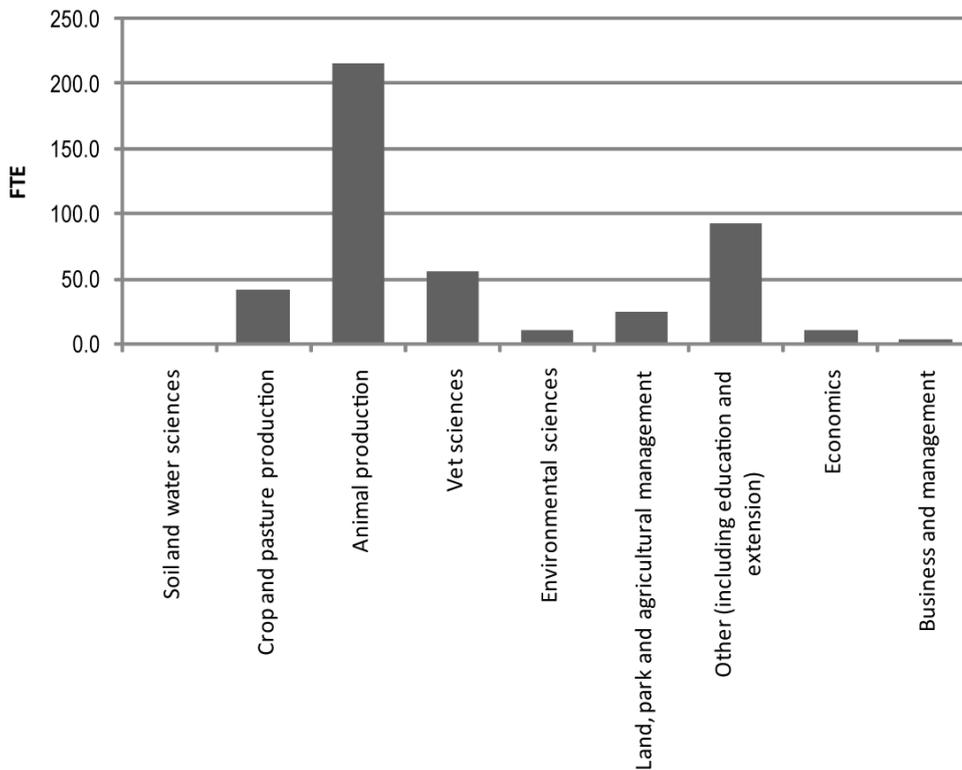
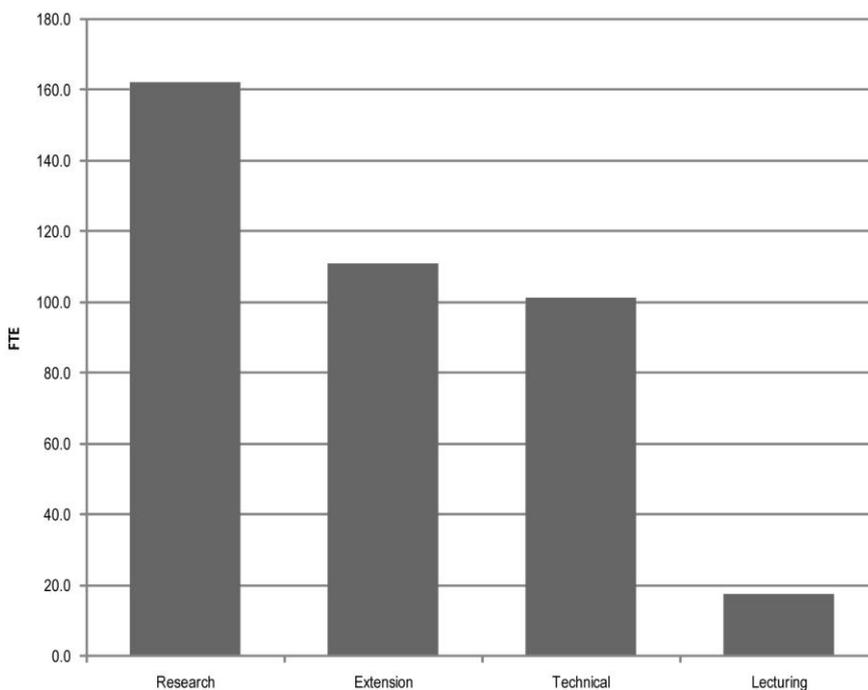


Figure 4.1 Full-time equivalent (FTE) staff in beef production research, development and extension by Australian Standard Research Classification series (2009)

Figure 4.2 provides a snapshot of capability defined by employment classification. Across all the research provider agencies, there are approximately 162 FTEs classified as research staff, 101 in technical roles and 111 classified as working in extension. When a 2.5 multiplier is applied to base salaries to account for internal organisation costs,⁷ the total investment in human capability is valued at \$79.8 million per year.



⁷ McCausland I (2006). *Report on MLA–DPI audit relating to livestock production research, development and extension*. Meat & Livestock Australia Ltd, Canberra.

Figure 4.2 Full-time equivalent (FTE) staff in beef production research, development and extension by employment classification (2009)

Figure 4.3 illustrates the heavy focus on productivity and cost-efficiency RD&E for the beef production sector — 200 FTEs allocated to strategic imperative 3. This is not surprising, given the focus that industry and government has applied to profitability and productivity in the past.

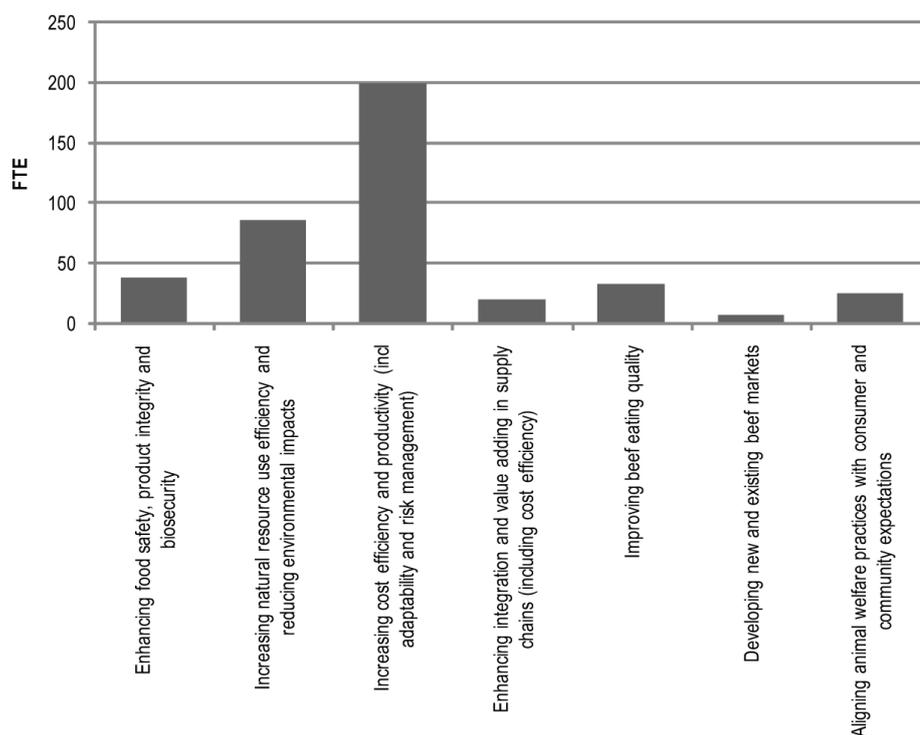


Figure 4.3 Full-time equivalent (FTE) staff in beef production research, development and extension by strategic imperative (2009)

The prioritisation of strategic imperatives and programs for future investment is underway within the RMCIC. Once this prioritisation is finalised, the RMCIC will consider emerging gaps in capability, and how capability could be moved into new investment areas through training, succession planning and interagency agreements. This process could include actions to address any problems identified relating to researchers supported by short-term or project-based funding.

In 2009, there were at least 125 postgraduate students undertaking studies relevant to the livestock industries (sheepmeat, beef, wool and dairy) and approximately 950 students due to graduate from tertiary courses relevant to the rural sector this year (Appendix C).

4.2 Infrastructure and intellectual property

Across the organisations contributing data to the Strategy there are 64 research stations located in agri-ecological zones suitable for cattle production. In total, 30 beef research herds are located across these research stations (Appendix D). Section 5.4 identifies the process that will be applied by the RMCIC to prioritise this infrastructure for retention and future investment.

4.2.1 Livestock and pasture resources and databases

Databases and sample collections have been created over many years of research across Australia. These are essential research tools. Often, historical data can be re-analysed to answer current questions and emerging issues that were not a priority in the original projects. These data can also provide important information in the design and implementation of new RD&E.

The member organisations of RMCIC own many databases and generally seek to ensure that data and intellectual property are available for future public good. Thus, these databases have been available for research and development, with access to data and outcomes licensed through appropriate contracts. It is likely that the future development of RD&E programs will require access to historical datasets and intellectual property — this should be a formal consideration of program development and implementation.

Government agencies have previously transferred relevant genetic and phenotypic resources from completed programs to new programs. For example, the transfer of New South Wales Net Feed Intake (NFI) cattle to South Australia and Western Australia allowed the continual recording of difficult and expensive-to-measure traits. It also enabled effective linkage between the projects that builds on the capacity to inform industry of genetic and genomic outcomes.

The maintenance and security of historical data bases has been an issue, particularly if computer software and hardware is changed or updated, or key staff retire or change roles. The development of centralised databases with common structures within each organisation is recommended. This will provide easier access to data resources in the future. Financial support may be required to ensure development of appropriately maintained databases.

– Significant beef databases include:

- Beef CRC 1 & 2 — this is a large database of genetic, growth and carcass information for *Bos taurus* and *Bos indicus* (including eating quality assessment)
- Beef CRC 3 — genetic resource (DNA bank) and female productivity data
- Industry and Investment NSW (I&I NSW) cattle database, which includes
 - Trangie growth-selection lines — growth, female performance, body composition, carcass information, genetic correlations and heritable traits (20-years of data)
 - Trangie NFI-selection lines — growth, female performance, feed intake, carcass information, genetic correlations and heritable traits (20-years of data)
 - data from the Grafton crossbreeding experiment — this included *Bos taurus* and *Bos indicus* crosses (20-years of first-cross, backcross and terminal cross data, growth, maternal performance, substantial carcass, eating-quality information and heterosis effects)
 - muscling selection lines (15-years of growth, performance, female performance, carcass, scans and body dimensional data)
- South Australia — The University of Adelaide and Primary Industries and Resources South Australia (PIRSA), which includes
 - data from the southern crossbreeding experiment (4 years of *Bos taurus* data, including first-cross data, growth, progeny performance and carcass data)
 - Jersey × Limousine crossbreeding data
- CSIRO — DNA database
- BREEDPLAN database — an Australia-wide genetic evaluation (commercial database).

Livestock resources include the NFI cattle lines and muscle-selection lines within I&I NSW, and new cattle lines developed for methane divergence.

Existing databases for beef are being shared through the Beef CRC. However, these arrangements have been facilitated and funded by Beef CRC. In the future, in the absence of a CRC or its equivalent, the function of coordinating access and sharing of livestock

resources and databases will be assumed by the RMCIC. An audit of beef industry databases will be undertaken by the RMCIC in 2010.

4.2.2 Pastures and plant genetic resources

The current Australian network of plant genetic resources encompasses three pasture collections:

- Australian Trifolium Genetic Resource Centre (Western Australia)
- Australian Medicago Genetic Resource Centre (South Australia)
- Tropical Crops and Forages Genetic Resource Centre (Queensland).
- Other pasture gene banks of value also exist within Australia:
 - temperate forages (grass, legumes and herbs) (Tasmania)
 - temperate forages (mostly grasses) (Victoria)
 - collections of white clover (*Trifolium repens*) and trefoil (*Lotus* spp) (New South Wales and Victoria).

Industry and government are currently unable to sustain these pasture plant gene banks and databases. The collections are at risk and their maintenance requires the attention of government and industry. The Australian Government has an obligation to support conservation and international distribution of seed since its signing of the International Treaty on Plant Genetic Resources for Food and Agriculture in 2002. The future of these genetic resources and databases needs to be considered and included in the development of a cross-sectoral RD&E strategy for pastures when it is developed.

4.2.3 Other forms of intellectual property

The agencies contributing to beef production RD&E in Australia own other forms of intellectual property not listed above, possibly including: copyrights, patents and inventions, trademarks (including brands), industrial design rights, circuit layouts, trade secrets and confidential information, know-how, plant breeders and variety rights, and moral rights. Also relevant are: digital, broadcast and URL rights, indigenous intellectual property, and rights relating to the use of indigenous flora and fauna. Patents and confidential information in particular are owned individually, jointly and collectively by the agencies themselves, as well as the joint ventures they have been involved in (eg CRCs). In many cases, packages of intellectual property are licensed to private entities for the purpose of commercialisation, and those agreements are enforceable.

It is impractical to list and define all the packages of intellectual property that will be relevant and valuable for current and future beef production RD&E, or indeed the commercial arrangements that have been put in place for each. The PISC R&D Subcommittee will be discussing this broad issue for all of the sectoral and cross-sectoral RD&E plans in early 2010 to be consistent with the principle ‘...to freely share the knowledge generated through the primary industries National RD&E Framework, including minimising barriers to RD&E created by intellectual property protection’. The parties to the Strategy and the RMCIC will pay particular attention to any new knowledge or intellectual property generated by parties working under the new arrangements. The guiding intent in the first instance will be to improve the flow of information for the benefit of Australian industry and the community. A realistic initial goal is to increase the access of all parties to know-how and confidential information, while at the same time endeavouring not to compromise commercial opportunities or the moral rights of the discoverers

