

# **Livestock Production Research & Development**

Strategic Plan 2006-2011

***ideas into action!***

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## Executive summary

Meat & Livestock Australia (MLA) has developed a strategic plan for research and development (R&D) into livestock production for the five years from 2006–2011. It provides the framework for how and where producer levies and Commonwealth government funds will be invested in livestock production R&D, together with the related areas of communicating with the industry and encouraging producers to adopt practices that will improve their profitability and sustainability.

The plan builds on existing plans and R&D activities while aiming to improve decision-making, execution and delivery of results. It is aligned with the Federal Government's National Research Priorities as well as Federal and State Government Rural R&D Priorities. Industry plans such as the *Meat Industry Strategic Plan* (MISP) have also been taken into account.

The plan is the result of extensive consultation with the industry and consideration of the strategies of other relevant organisations including Rural Research and Development Corporations (RDCs), Cooperative Research Centres (CRCs), state government departments of primary industry, the CSIRO and universities. We also have examined the social and political environment in which the industry will operate during the next five years.

MLA assumed the strategic plan should:

- Equip producers to run a profitable and sustainable business;
- Deliver value to producers;
- Look to the future, especially in relation to consumer needs;
- Take account of market demands for product quality, safety and environmental sustainability.

Based on the MISP, this plan is organised around five areas (see Figure 1, page 3):

- Science for the future;
- Healthy environments;
- Improved animal welfare;
- Improved productivity;
- Building knowledge and capacity.

In developing the plan we reviewed the following aspects of R&D investment:

- The mix of short, medium and long-term projects that are essential to creating a balanced national R&D portfolio;
- The overall process or 'roadmap' used to determine the R&D portfolio;
- The key drivers of farm profitability and sustainability so the impact of individual R&D projects can be assessed.

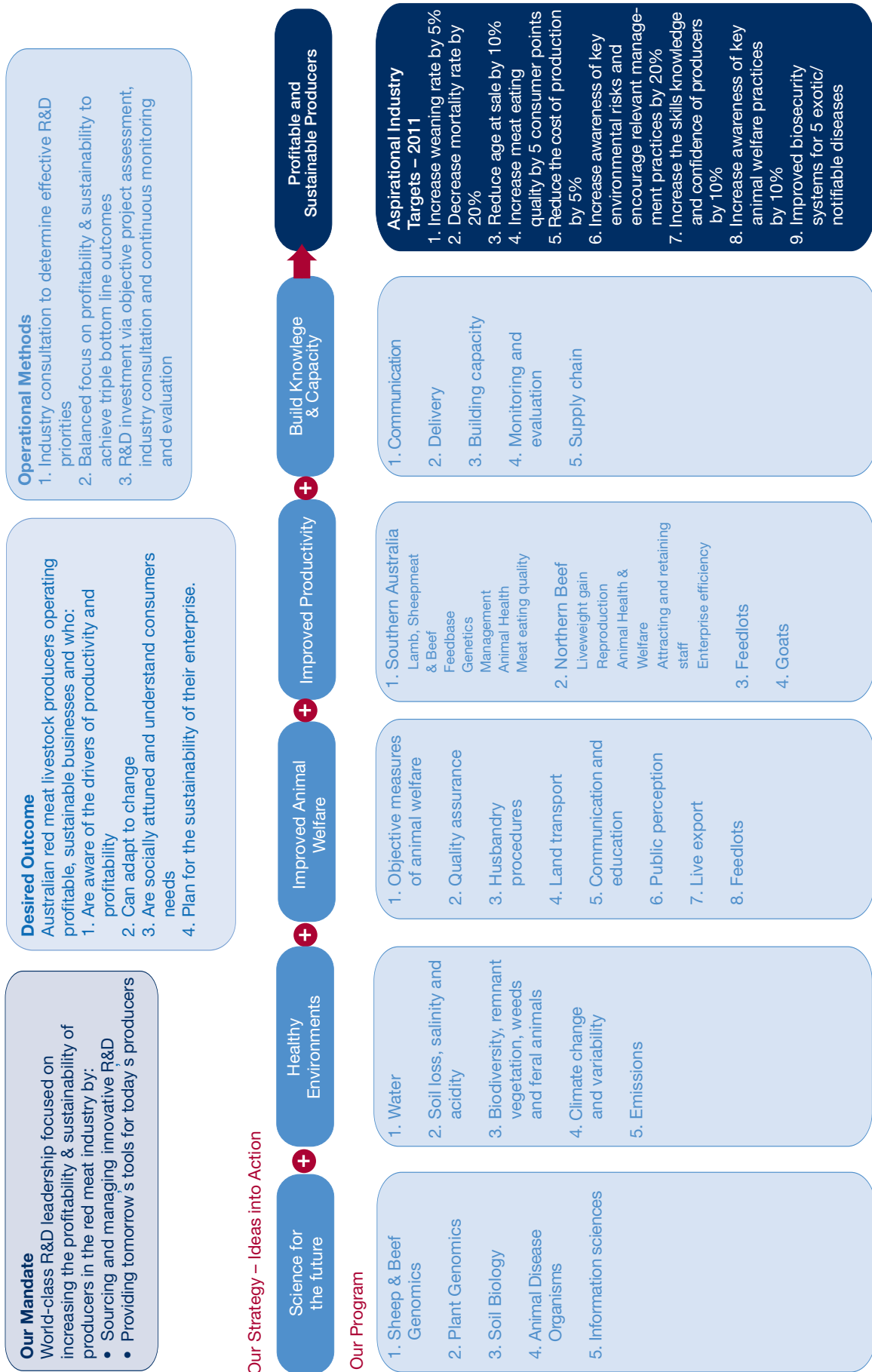
This document presents MLA's plan of action followed by an overview of how the plan was developed.

The plan will apply Australia-wide and is supported by detailed plans for the following sectors:

- Beef—Northern Australia
- Beef—Southern Australia
- Feedlots
- Lamb and Sheepmeat
- Goatmeat

These sector plans can be obtained by contacting MLA: [onfarm@mla.com.au](mailto:onfarm@mla.com.au)

Figure 1: An overview of MLA's livestock production R&D strategy for the period 2006-2011



**Our Key Measures**  
Project cycle time indicating efficiency of project administration; satisfaction by staff in internal surveys; survey results from major communication/education events; ex-ante and ex-post evaluation of major projects indicating quantitative benefits; increased awareness and adoption of targeted practices.

# **Section 1**

## Action plan

## 1 Action Plan

MLA's mission is to deliver world class services and solutions in partnership with industry and government. Its industry vision is a profitable, sustainable meat and livestock industry that meets consumer and community expectations. In delivering on its mission, MLA has adopted four main strategies:

1. Increase market access;
2. Grow demand;
3. Develop competitive advantage from paddock to plate;
4. Partner industry to build capacity.

All four areas are covered by livestock production R&D but the emphasis is on developing competitive advantage.

### 1.1 What MLA will do

We will invest in projects that will deliver value for money and focus on improving the profitability and sustainability of red meat producers. MLA's program for livestock production R&D is divided into five areas. These are based on categories highlighted as important in the *Meat Industry Strategic Plan* (MISP) and for which appropriate budget allocations have been made. See Figure 1 page 2.

The areas are:

1. Science for the future;
2. Healthy environments;
3. Improved animal welfare;
4. Improved productivity;
5. Building knowledge and capacity.

Within these five areas, the MLA Board has approved strategies for animal welfare, environment/natural resource management and communication and research adoption. These can be obtained by request to: [onfarm@mla.com.au](mailto:onfarm@mla.com.au).

#### 1.1.1 Science for the future

The Strategic Science program will continue MLA investments in:

- The application of genomics to sheep (together with Australian Wool Innovation Limited);
- Functional beef genomics (through the Beef CRC);
- Pasture plants (with Dairy Australia and the Geoffrey Gardiner Dairy Foundation);
- Soil biology (with Australian Wool Innovation Limited and Grains Research and Development Corporation);
- Animal health, including Johne's disease and parasites of sheep.

During the period 2006-2011 we will seek and support scientific discoveries that could underpin breakthrough innovations in any aspect of the meat production practice. This reflects industry recognition that investment in visionary R&D is necessary if we are to be in a strong position for the future.

#### 1.1.2 Healthy environments

R&D will concentrate on the following areas which are important throughout Australia:

- Water use and water quality;
- Soil loss, salinity and acidity;
- Biodiversity, remnant vegetation, weeds and feral animals;
- Climate change and variability;
- Emissions;
- Demonstrating environmental stewardship.

### 1.1.3 Improved animal welfare

Reflecting 12 months of industry consultation, MLA's animal welfare strategy will deal with:

- Objective measures of animal welfare;
- Quality assurance;
- Husbandry procedures;
- Land transport;
- Communication and education;
- Public perception.

Animal welfare R&D is also being undertaken in the area of live export.

### 1.1.4 Improving productivity

<i>Lamb and Sheepmeat</i>	decreasing mortality rates and reducing the cost of production (for example, through increasing pasture utilisation and feed efficiency), whilst improving growth rate and unit value.
<i>Southern Beef</i>	reducing cost of production (for example, through increasing pasture utilisation) and reducing age at sale.
<i>Northern Beef</i>	increasing reproductive rates (for example, increasing branding rates) and reducing age at sale.
<i>Feedlots</i>	decreasing mortality rates, increasing meat eating quality and reducing the cost of production.
<i>Goatmeat</i>	increasing awareness of natural resource management issues and improvement in meat eating quality, together with improvement in reproductive rates.

### 1.1.5 Building knowledge and skills

MLA recognises that it is important not only to generate knowledge but also to present that knowledge in a form that producers can take advantage of. Producers must be able to translate 'good ideas' into action.

Our R&D program will incorporate:

- Communication;
- Delivery;
- Improving skills, learning and decision support;
- Monitoring and evaluation.

The aims are to:

- Develop high quality awareness and participation/trial activities that reach as many producers as possible and maintain broad coverage across the capacity building methods;
- Implement strategic partnering activities with key intermediaries to increase producer adoption;
- Maintain a vigorous program that assists producers and their advisers to increase knowledge, skills and confidence to change on-farm practices;
- Evaluate new initiatives and measurement of effectiveness to improve the efficiency of the motivation/ exploration/ adoption cycle.

## 1.2 Profitable and sustainable producers: priorities and targets

The ultimate goal of MLA's 2006-2011 livestock R&D program is to increase producer profitability and sustainability. Based on input from the industry, nine R&D priorities have been adopted, with targets to be achieved over the five years. These are to:

- Increase reproductive rates (by 5%);
- Decrease mortality rates (by 20%);

- Reduce age at sale (by 10%);
- Increase meat eating quality (by 5 consumer points);
- Reduce the cost of production (by 5%);
- Increase awareness of environmental risks and encourage relevant management practices by 20%;
- Increase skills, knowledge and confidence of producers (by 10%);
- Increase awareness of key animal welfare practices (by 10%);
- Improved biosecurity systems for 5 exotic/notifiable diseases.

(See Section 5, Analysis of R&D Investment, for the relevant targets and also **Appendix 1** for details of the nine priorities).

### **1.3 How MLA will implement the plan**

In implementing the strategic plan MLA will focus on:

- Ongoing industry consultation and collaboration to identify shifts in current R&D priorities;
- Balancing profitability and sustainability to achieve triple bottom line outcomes for producers and the community;
- Continuously improving the effectiveness of R&D investments through objective project assessment, industry consultation, monitoring and evaluation.

### **1.4 Industry collaboration to determine R&D priorities**

MLA can help to facilitate the collaboration between different industry participants that is essential for the success of the Australian red meat industry. Effective collaboration can reduce duplication of effort, create synergies and make the most effective use of investments.

### **1.5 Balancing profitability & sustainability to achieve triple bottom line outcomes**

Producer workshops have continually highlighted the need to develop R&D projects that assist producers to improve their profitability while achieving desirable environmental and social outcomes.

### **1.6 R&D effectiveness through objective project assessment, industry consultation and continuous monitoring and evaluation**

MLA will select an appropriate mix of R&D projects using both objective and subjective methods. The objective methods outlined in Section 5 are based on economic modelling of profit drivers. Industry R&D advisory committees will be an important source of advice. R&D investment will be measured using processes to determine the outcomes of R&D.

### **1.7 National and sector priorities**

A key output of the outlined processes has been the creation of aspirational targets that focus R&D expenditure on areas which, in conjunction with industry, have the potential to drive improvements to broad industry profitability and sustainability by 2011 and take into account the Federal Government's National Research Priorities. Priorities also have been determined in consultation with industry groups. These priorities and targets are outlined in Tables 1 and 2.

The relative importance of different priorities is shown in Table 1. The shaded area represents the priorities that are shared across sectors; these areas are difficult to measure in terms of economic impact, however, feedback from industry groups has highlighted the importance of awareness and adoption and issues affecting sustainability.

**Table 1: Priorities according to sector**

Nine key priorities	Sectors				
	Lamb & Sheepmeat	Southern Beef	Northern Beef	Feedlots	Goats
Increase reproductive rates	xx	x	xxx	N/A	xx
Decrease mortality rates	xxx	x	x	xx	xx
Reduce age at sale	x	xx	xxx	xx	x
Increase meat eating quality	x	x	x	x	xxx
Reduce the cost of production	xx	xxx	xx	xxx	x
Increase awareness of environmental risks and increase relevant management practices	xxx	xxx	xxx	xxx	xxx
Increase skills, knowledge and confidence of producers	xxx	xxx	xxx	xx	xxx
Increase awareness of key animal welfare practices	xx	xx	xx	xxx	xx
Improved biosecurity systems for 5 exotic/notifiable diseases	xx	xx	xx	xx	xx

Note: xxx - highest priority, xx - medium priority, x - lower priority

Future R&D investment will be based on the nine priorities taking into account:

- Industry consultation about R&D priorities for individual sectors;
- Outcomes of the more detailed economic analysis on a project by project basis using a project evaluation framework (see MLA brochure *Investing in Research and Development—Information for Researchers* on [www.mla.com.au](http://www.mla.com.au));
- Analysis of the current R&D portfolio;
- Likelihood of change and adoption being achieved;
- Difficulty of achieving R&D solutions.

### 1.7.1 Identified priorities and targets

With industry input, targets have been developed to improve profitability and sustainability by 2011.

**Table 2: Targets for key priorities**

Nine key priorities	2011 target (related to base year 2005)
Increase reproductive rate	5%
Decrease the mortality rate	20%
Reduce the age at sale	10%
Increase meat eating quality	5 consumer pts
Reduce the cost of production	5%
Increase awareness of key environmental risks and encourage relevant management practices	20% of targeted producers
Increase the skills, knowledge and confidence of producers	10% of targeted producers
Increase awareness of key animal welfare practices	10% of targeted producers
Improved biosecurity systems for exotic/notifiable diseases	5 exotic/notifiable diseases

\*Note: Increase or decrease measures are over ABARE 2005/2006 industry averages where applicable.

It is intended that future projects will be evaluated with respect to their contribution to each of the nine priorities (and specifically to focus areas within each objective). Greater emphasis will be placed on those areas that support more than one of the key priorities for each sector.

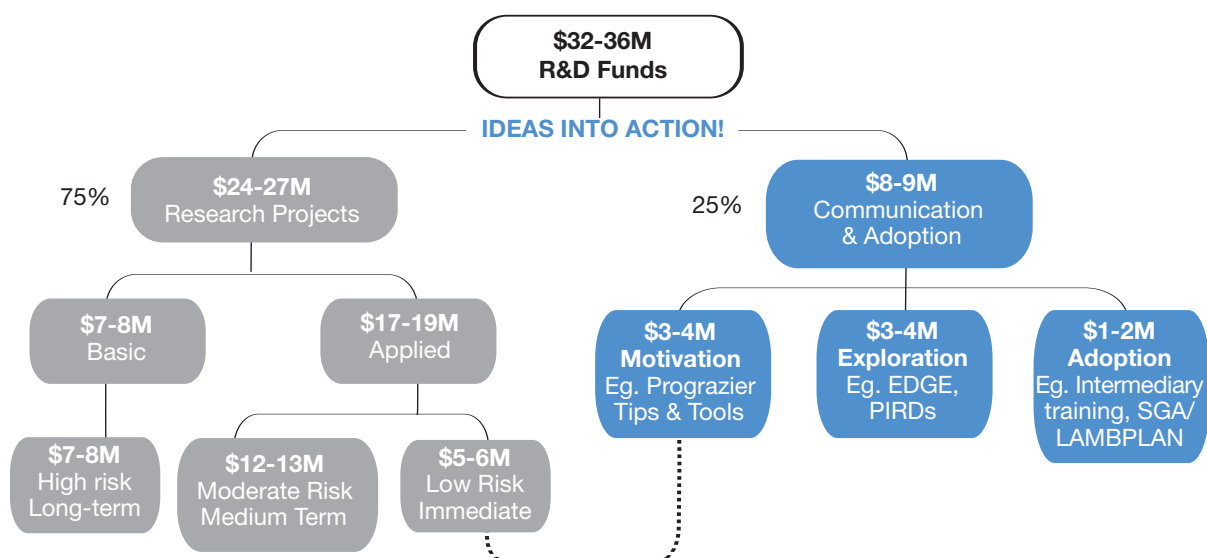
### 1.7.2 Budget

The industry has indicated that it supports expenditure being allocated as follows (Figure 2):

- Communication and research adoption (short-term) about 25% of the budget
- Medium-term projects about 50% of the budget
- Strategic and basic research (long-term) about 25% of the budget

Significant investments in science for the future ('blue sky' research) will continue, recognising the potential for new technologies to have a substantial impact on future profitability and sustainability. The current portfolio of basic and strategic science projects will finish around 2008/9. It is clear that continued financial support will be needed to develop mature products such as gene markers and other tools.

**Figure 2: Projected annual budget for livestock production R&D**



Note: Total budget will vary from year to year; but is likely to be around \$32-36 million per annum, of which 75 to 80% is typically committed to projects continuing from the previous year.

## **Section 2**

### How the plan was developed

## 2 Consultation with livestock production industry and government

MLA's current livestock production plans conclude in June 2006. Work on the 2006-2011 plan started in 2004 and continued through 2005 and early 2006. Preparing this new plan has involved extensive industry consultation, including meetings, workshops, correspondence and dialogues.

### 2.1 The consultative process

The first step was to brief Peak Councils and the Department of Agriculture, Fisheries and Forestry (DAFF) on the intended planning process. Then, in February 2005 once the process had been endorsed by the MLA Board, a workshop was conducted with senior members of Peak Councils, DAFF and MLA, and a representative of CSIRO.

Between March and October 2005 the Peak Councils were briefed further and workshops to discuss draft plans were held with the Southern Australian Beef Research Council, the Northern Australian Beef Research Council, the Lamb and Sheepmeat Research Advisory Committee, the Australian Lot Feeders Association Research and Development Sub-committee, the Goat Industry Council, major R&D funding organisations including sister Rural R&D Corporations and key research providers including the CSIRO.

Following further consultation with Peak Councils in November 2005, a revised document was sent to stakeholders for feedback before finalisation in May 2006. The plan will be reviewed annually to monitor progress and so that emerging issues can be considered promptly.

#### 2.1.1 Industry feedback

The consultative process made it clear the industry considered it was important to take account of the following:

- Federal government R&D priorities;
- Developing integrated systems, recognising the need for triple bottom line outcomes;
- Simultaneous improvement of profitability and sustainability;
- Better tools to enable producer uptake of R&D through proof of profit;
- Using innovative producers who have the ability to influence others in the industry;
- Appropriate measurements for program evaluation.

##### 2.1.1.1 Industry strategic plans

A number of different agricultural industry plans were also considered (see Appendix 2). All these plans identified similar strategic issues:

- Securing and maintaining further access to markets ;
- Effective marketing of product and value adding;
- Ensuring food safety and eating quality;
- Improving the efficiency of the whole supply chain;
- Addressing community concerns such as the environment, animal welfare and food safety.

At the more specific level of livestock production, common themes were the need to:

- Ensure the relevance and coordination of R&D;
- Improve profitability and sustainability;
- Manage natural resources;
- Minimise the impact of pests, weeds and diseases;
- Integrate the supply chain and foster the uptake of innovation.

### 2.1.2 Government input

This new livestock production plan is aligned with the Federal government's National Research Priorities:

- An environmentally sustainable Australia;
- Promoting and maintaining good health;
- Frontier technologies for building and transforming Australian industries;
- Safeguarding Australia.

We also drew on relevant government strategic plans, the Federal and State Rural R&D Priorities, and conferred with each of the state and territory departments of primary industry.

## **Section 3**

### General community factors

### 3 General community factors

An important aspect in developing the plan was to review the industry future in the context of the social and political environment in which it will operate during the next five years.

The *Australian Cattle and Sheep Industry Projections 2005* (published by MLA in January 2005), as well as the consultation process undertaken for this plan, identified several factors likely to impact on livestock production.

#### 3.1 Relevant social and political trends

Environmental and social sustainability and ensuring food safety, freedom from disease and appropriate animal welfare are critically important objectives for all red meat production industry sectors. Producers will need to be adaptable to change and attuned to issues that concern consumers. R&D programs will need to consider systems that deliver beneficial environmental and animal welfare outcomes.

#### 3.2 Natural resource management

The continued success of the Australian red meat industry will depend on the way the industry, with its 100,000 plus producers, manages its natural resources. Australia's natural resources have long been a source of competitive advantage and it is vitally important that these resources are maintained and remain available to the red meat industry.

A major challenge for the industry is to build competitive advantage while managing risk, so there is sustained growth. To achieve this, the industry must use natural resources in a sustainable way, meet the market with innovative products that recognise consumer needs, and enhance productivity across the value chain.

The industry has made significant progress in adopting Natural Resource Management (NRM) principles by improving production systems to address issues such as salinity, soil acidity, pests and soil erosion. We need to build on this work and ensure the industry can respond to critical issues such as biodiversity and greenhouse emissions.

#### 3.3 Animal welfare

A growing number of consumers in countries that trade with Australia now want to be assured that the products they are purchasing come from humane production systems. It is expected that consumer sentiment will increasingly favour meat sourced from farms that implement best practice animal welfare procedures. Fortunately, there is a strong link between appropriate animal welfare initiatives and improved profitability.

#### 3.4 Food safety and freedom from exotic disease/biosecurity

Research shows that modern-day consumers will opt for a healthy diet that includes red meat, provided such a diet is safe and nutritious. Future growth will depend on the red meat industry's ability to maintain a reputation as a healthy, disease-free supplier. Several departments within MLA are undertaking R&D into food safety but this is not an area for R&D in livestock production.

Currently many countries, including our largest customers, restrict the import of Brazilian and Argentinean beef due to Foot and Mouth Disease (FMD). These countries would otherwise be significant competitors to the Australian industry.

Ensuring freedom from a range of exotic diseases, including FMD, is an important issue for the whole of the livestock sector. MLA's livestock production plan will continue to include work with the Biosecurity CRC, the Australian Animal Health Laboratory and Animal Health Australia to support R&D in areas of biosecurity and disease surveillance that are important to the red meat industry.

#### 3.5 Future industry view

The factors outlined above are summarised in Table 3 below.

**Table 3: External challenges facing the red meat industry & the livestock production R&D response**

External challenges facing the red meat industry	R&D response
The potential impact of developing South American beef production, particularly Brazil	Focus on decreasing the cost of production while improving product quality and maintaining favourable disease-free status
Product differentiation as a key international strategy for Australian red meat, with quality as a differentiator, and a product that consumers know is safe and ethical	Focus on continuing to improve meat eating quality, animal welfare, and natural resource management
The price of wool relative to lamb and sheepmeat	Genetics R&D to enable selection of the best sheep for targeted outcomes
Consumer demand for high quality, consistent product	Focus on R&D through the supply chain to improve product quality and consistency
Unpredictable fluctuations in market prices	Focus on decreasing cost of production while maintaining product quality
Community concerns over animal welfare standards and the environment	R&D to address areas of community concern and focus on sustainability

## **Section 4**

### Analysis of R&D investment

## 4 Analysis of R&D investment

Investing in R&D generates new knowledge and tools that enable producers to:

- Be aware of what will most improve productivity and profitability in their enterprise;
- Adapt to change;
- Be socially attuned and understand consumer needs;
- Plan for the sustainability of their production systems.

MLA considered the following aspects of R&D investment:

- The relative proportion of short, medium and long-term projects necessary to achieve a balanced R&D portfolio;
- The overall process or roadmap used to determine the R&D portfolio;
- An R&D investment framework so that individual R&D projects can be assessed according to their ability to promote profitability and sustainability.

### 4.1 The need for different timeframes in an R&D portfolio

Currently livestock production R&D is a mix of short-term (1-3 years), medium-term (3-5 years) and long-term (5-15 years) projects that will enable livestock businesses to face the future armed with competitive products and services.

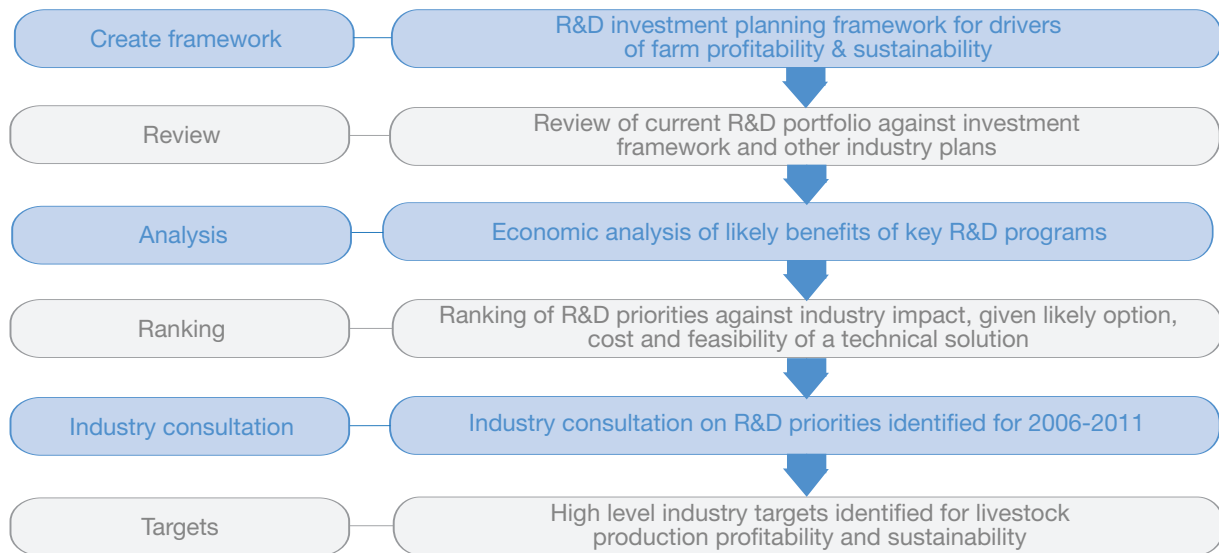
Short-term projects include a range of tools, products and knowledge that are ready to be adopted and are packaged and delivered to producers for maximum impact. Most medium-term projects extend the capacity or coverage of current tools: for instance, developing Estimated Breeding Values (EBVs) for new traits in BREEDPLAN® and LAMBPLAN®. Our portfolio of longer-term, strategic science R&D projects is diverse and mostly science that has a longer term time frame for its impact: such as sheep genomics, soil biology, sheep parasitology and investment in the CRC for Beef Genetic Technologies.

In terms of the future, there is limited scope to adjust the project mix in any one year because of commitments to research projects that span several years. For example, an average R&D project runs over 3-5 years which leaves only 10-30% of the total budget available for any one year. MLA's policy therefore is to evolve the portfolio over time rather than to make radical changes that may impede the delivery of real benefits to producers.

## 4.2 R&D investment planning roadmap

As part of its planning process MLA adopted a roadmap for developing an R&D investment plan (see Figure 3 below). This involved reviewing the portfolio against an economic framework, consulting with industry on R&D priorities and identifying targets for industry change.

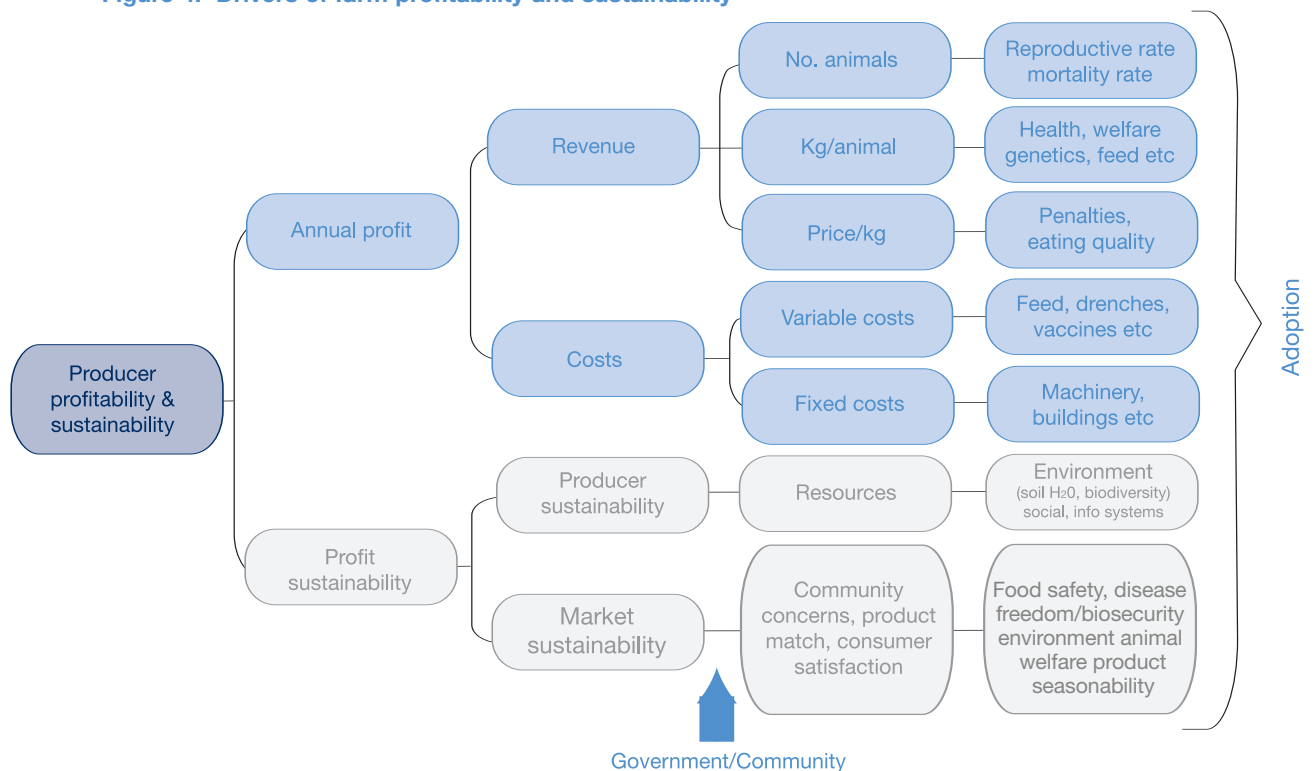
Figure 3: Livestock production R&D planning roadmap



## 4.3 An R&D investment framework

Both the current R&D portfolio and potential areas for R&D investment were analysed according to the key drivers of on-farm profitability and sustainability (see Figure 4). While genetics and feed have been included in the diagram, these factors, together with management, impact all drivers of revenue as well as variable costs.

Figure 4: Drivers of farm profitability and sustainability



Producer profitability and sustainability is a function of annual profit and profit sustainability. Annual profit is a function of revenue and costs. In relation to meat production, revenue is related to the number of animals, kilograms per animal, and price per kilogram. Each of these factors is influenced by aspects such as reproductive and mortality rates, health and eating quality. Costs are both variable and fixed and some of these are indicated in the framework.

Sustainability is also important. The framework shows areas of producer and market sustainability and covers:

- Natural resource management;
- Social factors;
- Information systems;
- Food safety;
- Freedom from disease, biosecurity;
- Animal welfare;
- Consumer satisfaction.

Importantly, these issues are increasingly likely to influence profit and so using this framework we can decide where R&D is likely to have the most impact. For details of how MLA analysed the way R&D influences the different drivers of farm profitability, see Appendix 3.

From this analysis R&D targets were developed for the industry as a whole, while each sector (Northern Beef, Southern Beef, Lamb and Sheepmeat, Feedlots and Goatmeat) produced an individual plan.

For the industry as a whole, the most important shared objectives are environmental and social sustainability, food safety, disease control/biosecurity and animal welfare. The other objectives vary in their importance according to individual industry sectors, as follows:

<i>Lamb and Sheepmeat</i>	decreasing mortality rates and reducing the cost of production (for example, through increasing pasture utilisation and feed efficiency), whilst improving growth rate and unit value.
<i>Southern Beef</i>	reducing cost of production (for example, through increasing pasture utilisation) and reducing age at sale.
<i>Northern Beef</i>	increasing reproductive rates (for example, increasing branding rates) and reducing age at sale.
<i>Feedlots</i>	decreasing mortality rates, increasing meat eating quality and reducing the cost of production.
<i>Goatmeat</i>	increasing awareness of natural resource management issues and improvement in meat eating quality, together with improvement in reproductive rates.

The relative importance of different priorities is shown in Table 1 (page 8). The shaded area represents the priorities that are shared across sectors; these areas are difficult to measure in terms of economic impact, however, feedback from industry groups has highlighted the importance of awareness and adoption and issues affecting sustainability.

#### 4.4 Identified priorities and targets

With industry input, targets have been developed to improve profitability and sustainability by 2011. These are outlined in Table 2 above (page 8).

Projects and programs are outlined against the nine identified priorities and targets in Appendix 1.

## **Section 5**

### Current R&D programs: achievements and challenges

## 5 Current R&D programs: achievements and challenges

MLA's current R&D programs are supported by a matrix of industry sectors and budget areas within the *Meat Industry Strategic Plan (MISP)*.

These areas are outlined below, along with past investment, key areas of achievement, and future issues and challenges. Individual sector plans have been developed for Northern Beef, Southern Beef, Lamb and Sheepmeat, Feedlots and Goatmeat.

### 5.1 Southern Beef, Lamb and Sheepmeat, and Goatmeat

The Southern Beef, Lamb and Sheepmeat, and Goatmeat programs are complementary and so they are dealt with together. While each program may have different priorities, the areas of interest are the same, and consist of environment and feedbase development and management, improving animal and herd/flock productivity, and improving supply chain efficiency.

#### 5.1.1 Past investment and achievements

Significant investment and achievement has occurred in the following areas:

- Growth in genetic evaluation and genetic progress in sheep and cattle;
- The sustainable grazing system program and development of its successor for the wheat/sheep zone, Grain & Graze, which demonstrates practices that simultaneously improve productivity and sustainability;
- Sheepmeat eating quality R&D and initial implementation of electrical stimulation;
- Gene markers for marbling and tenderness in beef;
- Improved tests for net feed efficiency;
- Development of R&D communication/delivery/extension packages such as MLA's More Beef from Pastures, Prime Time forums and EDGE<sup>network</sup>® courses.

#### 5.1.2 Issues and challenges

- Animal genetic improvement is impacting on how to manage pastures for maximum profit;
- Pasture management needs to be significantly altered to increase usage;
- Profitability and sustainability must be considered simultaneously;
- R&D must be effectively coordinated with other Rural RDCs;
- Budget limitations for R&D.

There are significant similarities between Lamb and Sheepmeat R&D and that undertaken by Southern Beef. Where there can be mutual benefit, some research is supported from lamb and sheepmeat and beef funds.

Lamb and Sheepmeat R&D meetings have identified several additional issues:

- Effective coordination of R&D in areas that affect both wool and meat sheep;
- Maternal genetics, carcass information and quality feedback;
- New feeding systems, particularly for finishing lambs;
- Easy access to information about elite genetics;
- Animal welfare issues, including lamb mortality;
- Minimising disease costs;
- Understanding key profit drivers.

Southern Beef R&D meetings have identified these additional issues:

- Soil R&D;
- Importance of quality assurance systems for animal welfare;
- Genetics R&D to ensure adaptability of animals to their environments;
- Ensuring natural resource R&D is coordinated with appropriate national groups;
- Weeds R&D – making weeds work for us;
- Importance of working with appropriate intermediaries for improving adoption of research outcomes.

Goatmeat R&D meetings have identified these additional issues:

- Development of supply chain and higher value goatmeat products;
- Increasing supply to meet existing domestic and export demands;
- Understanding the impact of goats on the environment;
- Fully realising the potential of existing R&D through extension and adoption activities.

## 5.2 Northern Beef

This program undertakes on-farm R&D for beef production in Queensland, the Northern Territory, and the Kimberley and Pilbara regions of Western Australia.

### 5.2.1 Past investment and achievements

Significant investment and achievement have occurred in the following areas:

- Improvements in more effective nutritional supplementation;
- Grazing and fire management to both maintain and improve the natural resource base upon which the industry depends;
- A number of bio-control projects targeted at significant weeds including rubber vine, parthenium and Giant Rat's Tail grass;
- The development of tenderness gene markers, particularly benefiting *Bos indicus* breeds;
- EDGENetwork® courses developed specifically for the northern beef industry;
- Major projects to improve genetics in the northern beef industry.

### 5.2.2 Issues and challenges

- Sustainable grazing land management that optimises production;
- Better packaging and communication of research results;
- Attracting and retaining staff in a competitive labour market;
- Nutrition to improve liveweight gain and reproduction;
- Animal welfare – especially husbandry procedures;
- Weed biocontrol;
- Water quality and distribution;
- Vegetation management and woodland thickening;
- Enterprise efficiency and cost of production;
- The range of environments and different production systems within the program's geographical boundaries;
- Budget limitations that affect project selection.

## 5.3 Feedlots

The feedlot R&D program has strong support from the Council of the Australian Lot Feeders' Association (ALFA) and the ALFA R&D sub-committee.

### 5.3.1 Past investment and achievements

- Projects to address feedstuff shortages during periods of drought, including the evaluation of alternative high-energy feedstuffs that can be used to replace part of the grain in feedlot rations;
- Development of the National Beef Cattle Feedlot Environmental Code of Practice;
- A range of initiatives to combat excessive heat load in feedlot cattle, including a forecast service that can predict the onset of excessive heat load out to six days and a software package that can be used by feedlot operators to evaluate the risk of excessive heat load conditions occurring on their particular site.

### 5.3.2 Issues and challenges

- Projected significant expansion of the lot feeding industry;
- The varying sizes of feedlot operations and the environments in which they operate;
- Issues that arise as a result of the high public profile of the industry and increasing regulation.
- Access to and security of water supply, which is seen as the most significant limitation on the growth potential and size of the feedlot sector into the future;

- Reliable supply of the cattle, grain and labour inputs required to secure the existing industry and service the expected industry expansion;
- Development of a whole of supply chain approach to the management of bovine respiratory disease, which continues to be a major problem for the industry.

## 5.4 Environment, Animal Health and Welfare Program

This program is intended to increase the sustainability of the whole farm system with a specific emphasis on environment, animal health and welfare issues. Research may be undertaken either to inform policy or to assist with positioning the industry for changes in the market.

Objectives that support environmental sustainability of the whole farm system are also linked to government natural resource management R&D priorities.

### 5.4.1 Past investment and achievements

Significant investment and achievement has occurred in the following areas:

- Understanding of ovine Johne's disease leading to an effective vaccine;
- Information about developments in the prevention, diagnosis, treatment and control of calf scours with expanded basic management principles for control, and enabling a clear and consistent approach, and reducing producer costs;
- Development of a new diagnostic test for bovine tuberculosis, leading to improved surveillance to demonstrate freedom from this disease/
- Development of an integrated research framework for understanding and developing objective animal welfare measures;
- Development of a reliable test for on-farm measurement of animal temperament and initial work to investigate the relationship between genetics of temperament and animal welfare;
- Transformation of existing industries through the Sustainable Grazing Systems project and a major new investment in Grain & Graze and Environmental Management Systems;
- Management of soil through plant breeding for perennial pastures, sustainable grazing for saline land, environmentally responsible fertiliser use and remote sensing of land conditions projects;
- Focus on climate change through work on drought management, an internet tool for climate risk and improved seasonal climate forecasts.

### 5.4.2 Issues and challenges

#### Animal Health and Welfare

- Understanding the economic impact of endemic diseases;
- Improving surveillance to demonstrate freedom from disease and assist biosecurity
- Increasing scrutiny of farm practices by activists, markets and the general community;
- Improving Australian animal welfare research capabilities;
- Achieving internationally recognised research outcomes and preventing the imposition of restrictions and policies that are impractical in Australia;
- Management of internal parasites of sheep, particularly through prevention.

#### Natural Resource Management

- Increased scrutiny by environmental activists, government, community and markets;
- Cost and difficulty of measuring impacts/outcomes;
- Geographically diverse issues and challenges;
- Climate change;

An issue for both areas is the lack of direct signals to the producer regarding poor/improved welfare and NRM practices.

## 5.5 Strategic Science

This program focuses on developing technologies for long-term growth and transformation. The anticipated time to delivery is 5 to 15 years.

### 5.5.1 Past investment and achievements

In recent years the Strategic Science portfolio has focused on the application of genomics to sheep (together with Australian Wool Innovation Limited), functional beef genomics (through the Beef CRC), pasture plants (with Dairy Australia and the Gardiner Foundation) and soil biology (with Australian Wool Innovation and Grains Research and Development Corporation). This reflects industry recognition that longer term R&D investment is necessary to better position the industry for the future. The program has also supported the bridge from education to agricultural research through a postgraduate program and various scholarships. Upon completion, more than 70% of students supported by this scheme continue to work within the meat and livestock industry.

### 5.5.2 Issues and challenges

- Maintaining effective communication with industry, including the establishment of a pipeline to link knowledge and tools from researchers to producers;
- Complexity and timeliness of collaboration with other Rural RDCs, CRCs and the Australian Research Council;
- Issues around commercialisation of new technology;
- Maintaining research capacity in strategic science.

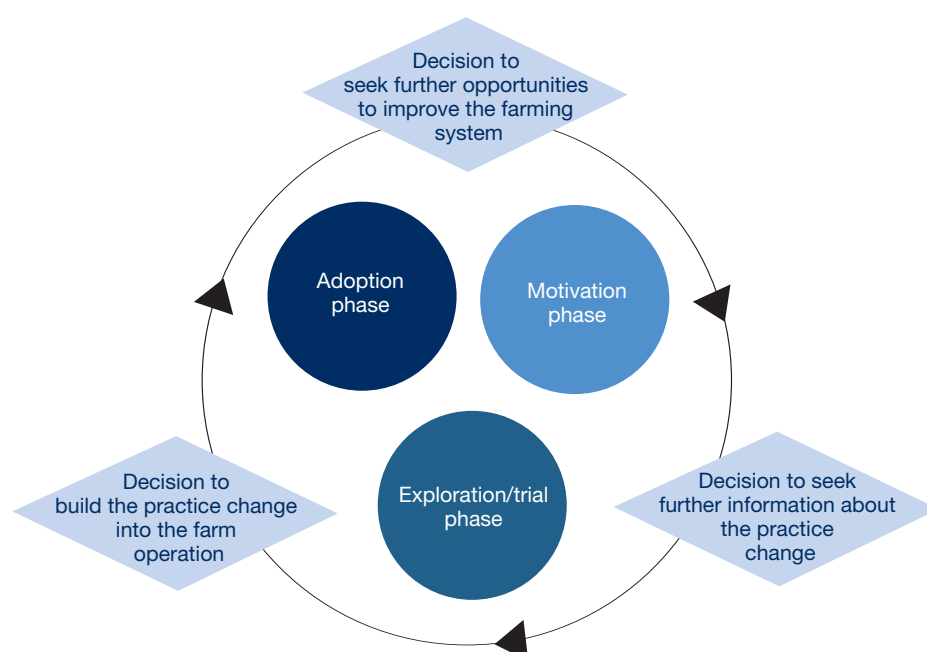
## 5.6 Communication and Research Adoption

The overall objective of the Communication and Research Adoption program is to communicate, facilitate the use of, and help deliver the tools and information resulting from MLA's R&D to its livestock producer and lot-feeder stakeholders.

### 5.6.1 Past investment and achievements

MLA has focussed its communication and research adoption on awareness, delivery, and capacity building activities to influence producers' motivation, exploration and trialling, and adoption of improved management practices (refer Figure 5).

**Figure 5: Research adoption model developed from Sustainable Grazing Systems program**



The three phases are explained on page 25 .

### 1. **Motivation—making producers aware of technologies and the opportunity for their businesses**

MLA carries out a range of activities aimed at raising producer awareness and motivating them to explore further. *Prograzier* magazine is distributed to 15,000 producers in southern Australia, and is highly rated as an influence of on-farm management decisions. A similar publication, *Frontier*, has commenced for Northern Australia in 2006. The MLA website contains reports and additional resources. Other initiatives such as producer forums (including Prime Time and More Beef from Pastures) have directly engaged thousands of producers resulting in approximately two-thirds of participants changing management practices.

### 2. **Exploration/trial—enabling the development of skills, knowledge and confidence in a technology**

MLA has a range of group-facilitated programs including: BeefCheque<sup>®</sup>, LambCheque<sup>®</sup>, BeefPlan, producer research support (including Producer Research Support eg. PIRDs<sup>®</sup>, and various demonstration trials), Prime Time workshops, and MLA's co-investments with Bestwool/Bestlamb and Bestprac. These co-investments have also been shown to be highly influential in changing management practices of those involved. EDGEnetwork<sup>®\*</sup>, a structured learning program involving more than 50 workshops that can be delivered across Australia, is a major component of MLA's investment in producers' exploration/trialling phase.

### 3. **Adoption**

Once producers have decided to 'scale up' with a technology, these products support the change:

- More Beef from Pastures tools;
- Tips and Tools sheets on a variety of industry issues;
- Sheep Genetics Australia (SGA)—tools to deliver breeding values to enable producers to achieve genetic gain;
- EDGEnetwork<sup>®</sup> workshops;
- Training/engagement of Intermediaries.

#### 5.6.2 **Issues and challenges**

- Up to half of all producers are not open to changing management practices (from MLA Producer Awareness/Adoption survey Dec 2003);
- Most producers rely on several sources of information, influence and support for on-farm management decisions;
- Effective application of technology by producers requires capacity building—skills, knowledge and confidence;
- Declining extension resources, and less than 15% of producers use private sector consultants;
- Effective collaboration with agribusiness, state departments, consultants and other Rural R&D Corporations, to improve the efficiency of producer information transfer, learning and change;
- Measurement of adoption and outcomes to convince more producers of benefits, adjust programs to increase effectiveness and report against the triple bottom line to assess return on investment.

### **Conclusion**

There have been significant achievements during the previous 5 year livestock production R&D plan. In looking to the period 2006 – 2011, the major industry issues have been considered and extensive consultation carried out. However, we are well aware that new challenges can arise and annual review of this plan will be important to ensure continued relevance.

# Appendices

## Appendix 1: Projects and programs outlined by nine identified targets

Target area	Continuing R&D	Opportunities for R&D support
<p><b>Increase reproductive rates</b>  <i>Target - 5% increase by 2011 for sheep (meat sheep) 2% pa for 5 years</i></p>	Northern genetics projects, including those through Beef CRC	Reducing perinatal lamb mortality (ewe behaviour, ewe nutrition, maternal genetics & gene markers for lamb survival & ewe behaviour)
	High impact management systems for supplements	Toxoplasma R&D
	PCR diagnostic tests to assess impact of disease on reproductive performance	Increased reproductive performance in beef cattle mainly correlated responses with improved technologies for early reproductive success co-investment with Dairy CRC
	Improved reproduction through genetics, management & grazing systems	Improved technologies for early reproductive success
		DNA markers for improved reproductive efficiency
		Benchmark causes of perinatal mortality
		Impact of Vitamin A on calf wastage
		New species & traits for plant genomics
		Genetic relationship between reproduction, feed efficiency & carcass traits
		Gene markers for increased disease resistance
<p><b>Decrease mortality rates</b>  <i>Target - reduce by 20% by 2011</i></p>	Bovine Ephemeral Fever	Calf scours
	Biology of ovine Johne's disease	
	Sheep parasite resistance	
	Calf scours	
	High impact management systems for supplements	

## Appendix 1: Projects and programs outlined by nine identified targets

Target area	Continuing R&D	Opportunities for R&D support
<b>Increase growth rates</b> ( <i>Target – reduce age at sale by 10% by 2011</i> )	Better pasture plants & pasture utilisation	New species & traits for plant genomics
	New rumen microbes from native fauna/ improved efficiency of rumen functions	Acceptable alternatives to hormonal growth promotants
	Release of new varieties of Leucaena & forage oats	Decision support system for nutritional requirements
	Investment in performance recording & genetic evaluation efficiency of wool & meat production	Reduction of animal maintenance requirement, & improved
	Faster genetic improvement for growth rate	Whole of farm environment & business risk models
	Increased pasture utilization & varieties	Diagnostic tests for sheep internal parasites
		Tests for tick resistance
		Functional nutrition/health of meat
		Gene markers for cattle resistance to tick
		DNA markers for eating quality in beef & sheep
<b>Maximise product value</b> ( <i>Target – increase meat eating quality by 5 consumer points by 2011</i> )	Gene markers for marbling, tenderness in beef	Progeny testing for functional & nutritional aspects of meat
	Genetic improvement in carcass & other traits, including data recording	Whole of farm environment & business risk model
	Genetic data & markers for tenderness, meat yield & resistance to parasites	Reduction of animal maintenance requirement, & improved efficiency of wool & meat production
		Methods for manipulating the plant root/soil microbe interface
		Increased pasture growth from improved soil health
		Pastures Australia – improved pasture selection
<b>Decrease cost of production</b> ( <i>Target – reduce cost of production by 5% by 2011</i> )	Gene markers for reduced feed requirements in beef cattle	
	Climate risk, pasture growth tool efficiency of wool & meat production	
	Markers for improved muscle growth & efficiency in sheep	
	Marker assisted selection of drought tolerant grasses	
	Increased pasture utilisation	

## Appendix 1: Projects and programs outlined by nine identified targets

Target area	Continuing R&D	Opportunities for R&D support
<p>Increase environmental sustainability of whole farm system (Target: increase awareness of key environmental risks and increase relevant management practices by 20%)</p> <p>Increase social sustainability of whole farm system (Target – increase skills, knowledge &amp; confidence of targeted producers by 10% by 2011)</p>	Climate risk & pasture production tool	Integrate historical & real time data to improve decision making
	Life cycle analysis	Develop producer tools to measure soil water
	Impacts of ground cover, riparian management & fertilizers on water quality	Measure soil, plant & animal community characteristics
	Perennial pasture system projects and sustainable grazing catchment studies	Incorporate on-ground measures into remote sensing systems
	Weed control, fire management, native pastures, remnant vegetation management	Understand the environmental footprint of the red meat industry
	Extension of climate change & variability information & tools through EDGENetwork®	Develop novel adoption drivers that provide additional incentives for NRM investment
	Develop & extend practices which increase feed conversion efficiency to reduce greenhouse gas emissions	Drought-risk prediction
	Research opportunities to re-use feedlot effluent	Greenhouse gas – methane redirections, carbon sequestration
	Improving information delivery via communications including key publications & the internet	Strategic partnerships with intermediates including agribusiness
	Increasing the reach of producers through delivery/learning platforms eg. MLA Prime Time, MLA More Beef from Pastures	Development of market systems for marker assisted selection in plants & animals - producer training - business models
Capacity building programs such as EDGENetwork®, PIRDS demonstration trials, producer network support education sector support	Examining potential for extending collaboration on EDGENetwork®	
	Collaborative research into key factors influencing on-farm change	Collaborative research into key factors influencing on-farm change
	Benchmarking & monitor farms	Benchmarking & monitor farms
	Collaborative projects with other RDC, CMAs for adoption of NRM practices	Collaborative projects with other RDC, CMAs for adoption of NRM practices

## Appendix 1: Projects and programs outlined by nine identified targets

Target area	Continuing R&D	Opportunities for R&D support
<p>Address priority issues in animal welfare (Target: Increase awareness of key animal welfare practices by 10%)</p>	<p>Pathogenesis of disease economic modelling of disease costs and impacts</p>	<p>Diagnostics, control methods</p>
	<p>Objective measures R&amp;D—implement integrated research framework</p>	<p>Objective measures R&amp;D - identify research areas &amp; projects within the framework</p>
	<p>Land transport - determine animal welfare outcomes &amp; develop a risk management approach</p>	<p>Land transport - R&amp;D to understand relationship between curfews, food safety, meat quality &amp; animal welfare</p>
	<p>Quality assurance - on-farm animal welfare QA module</p>	<p>Continue to investigate best practice &amp; update on-farm QA module to improve overall standards</p>
	<p>Public perceptions - continued monitoring</p>	<p>Public perceptions - R&amp;D to ensure understanding of changing perceptions &amp; to assist future R&amp;D prioritisation</p>
	<p>Communication &amp; education - understand demand for education package for students or personnel in the livestock industries</p>	<p>Additional education packages as required for producers &amp; students to facilitate uptake of research outcomes</p>
	<p>Husbandry procedures - examining options for pain relief, &amp; understand the genetics of temperament &amp; its relationship with animal welfare</p>	<p>Alternative cost effective methods for managing routine husbandry to improve animal welfare</p>
	<p>Support the building of Australian animal welfare research capacity &amp; international research linkages</p>	
	<p>Disease surveillance projects with Australian Biosecurity CRC</p>	<p>Improved surveillance methods for screw worm fly</p>
	<p>Support Australia's favourable disease status, through targeted research to improve disease surveillance and biosecurity (Target: Improved biosecurity systems for 5 exotic/notifiable diseases).</p>	<p>Other priorities identified in consultation with Animal Health Australia</p>

## Appendix 2: Summary of various industry body strategies

Organisation	Period of plan	Relevant major areas of focus	Measures/outcomes
The Meat Industry Strategic Plan “More From Less”	2004–2009	<ul style="list-style-type: none"> <li>• Market access—securing new access and maintaining existing access</li> <li>• Product marketing</li> <li>• Value adding</li> <li>• Food safety</li> <li>• Eating quality</li> <li>• Community concerns</li> <li>• Whole of chain efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Strength and focus on “blue sky” R&amp;D allowing commercial interest to drive product specific initiatives</li> <li>• Maintain domestic and international marketing programs as priorities</li> <li>• Expansion of value adding activities and maximising returns from by-products</li> <li>• Minimising risks of contamination, residue, disease; eating quality maintained as central theme and implementation of eating quality grading and labeling.</li> <li>• Determining social compliance best practice, eg, animal welfare, environment issues — measure and demonstrate industry achievements in areas of community concern.</li> <li>• More attention to whole of chain efficiency with focus on changes to improve commercial communications between enterprises.</li> </ul>
Australian Government Department of Agriculture, Fisheries and Forestry Corporate Plan	2003–2006	<ul style="list-style-type: none"> <li>• Sustainable management of resources</li> <li>• Competitive agriculture, fisheries, forestry and food industries</li> <li>• Self-reliant and innovative agriculture, fisheries, forestry and food industries</li> <li>• Access to markets</li> <li>• Pest and disease protection</li> <li>• Scientific advice</li> <li>• Economic research</li> </ul>	<ul style="list-style-type: none"> <li>• Adoption of sustainable practices and increased awareness and understanding of natural resource issues</li> <li>• Profitable, commercially sustainable industries responsive to market conditions</li> <li>• Awareness and participation in programs to support change and adjustment and improve business, risk and resource management and uptake of research and innovation</li> <li>• Maintain existing markets and create new trade opportunities, maintain integrity &amp; delivery of inspection</li> <li>• Maintain Australian favourable animal and plant health status and ensure scientific and technical advice underpinning import and quarantine policy</li> <li>• Scientific advice reflected in National Policy decisions.</li> </ul>

## Appendix 2: Summary of various industry body strategies

Organisation	Period of plan	Relevant major areas of focus	Measures/outcomes
Northern Australian Beef Research Council	2004-2008	<ul style="list-style-type: none"> <li>Increasing relevance of research, development extension, education and training to user needs</li> <li>Facilitating co-learning and communication between production and research and development people and organisations</li> <li>Using position as informed forum to advise and advocate better industry and government policies on research and innovation and participate in prioritisation and management of R&amp;D programs</li> </ul>	<ul style="list-style-type: none"> <li>Northern beef producers who will:</li> <li>Be able to apply new technology easily and confidently</li> <li>Have profitability, sustainability and security</li> <li>Be able to respond to things imposed on industry and individuals</li> <li>Make increased use of R&amp;D outputs which are user friendly</li> <li>Effectively influence R&amp;D priorities</li> <li>Not just rubber stamp research and take it up without question.</li> </ul>
Southern Australian Beef Research Council	2002-2005	<ul style="list-style-type: none"> <li>Provide a Southern beef industry focus to R&amp;D initiatives</li> <li>Initiate partnerships and opportunities for networking among all sectors</li> <li>Foster a more collaborative and coordinated approach to achieve R, D and E priorities</li> <li>Create more opportunities to increase a rate of innovation</li> <li>Encourage the development of a viable and sustainable beef industry for the future.</li> </ul>	<ul style="list-style-type: none"> <li>Know how to maximise beef production from feed resources</li> <li>Know how to control and manage diseases and health problems</li> <li>Know how to maximise feed from pastures without degrading land</li> <li>Business and planning skills to maximise return on investment</li> <li>Knowledge and skills to adapt production systems to market specifications</li> </ul>
NSW Department of Primary Industries – Strategic Directions	Towards 2020	<ul style="list-style-type: none"> <li>Innovation and international competitiveness</li> <li>Wise use of natural resources</li> <li>Animal and plant protection</li> <li>Serving the broader community</li> </ul>	<ul style="list-style-type: none"> <li>New technologies that deliver increased prosperity while minimising environmental impacts</li> <li>Production systems that achieve goals of profitability and sustainability</li> <li>Development and commercialisation of biotechnology</li> <li>Enhanced plant and animal genetics</li> <li>Water, soil and land use practices that are environmentally responsible</li> <li>Improved understanding of climate variability and management of drought risk</li> <li>Reduced reliance on chemical treatment for diseases, parasites and pests</li> <li>Protection from invasive pests and diseases</li> <li>Enhance responsiveness to animal disease emergencies</li> </ul>

## Appendix 2: Summary of various industry body strategies

Organisation	Period of plan	Relevant major areas of focus	Measures/outcomes
Department of Primary Industries and Fisheries Queensland	2004-2009	<ul style="list-style-type: none"> <li>Increase productivity</li> <li>Develop markets</li> <li>Strengthen business adaptability</li> <li>Enhance sustainability</li> <li>manage risks presented by pests and diseases to animal and plant industries</li> <li>Ensure proper care and treatment of all animals in Queensland and ensure market access for products of Queensland primary industries</li> </ul>	<ul style="list-style-type: none"> <li>Safe, quality assured food and fibre</li> <li>Consumer confidence in integrity of the state's primary products.</li> <li>Demonstrated adoption of improved practices for enterprise profitability, productivity and competitiveness</li> <li>Strategic collaboration to enhance output among key service providers</li> <li>Projected value of international and domestic trade resulting from adoption of products and technologies developed by DP&amp;F funded research</li> <li>Commercial return from application of intellectual property</li> <li>Policy leadership to ensure the state's primary industries are sustainable</li> <li>Level of community confidence in prevention and control of biosecurity threats</li> <li>Level of community confidence that systems are in place to protect the welfare of animals in Queensland.</li> </ul>
Victoria Department of Primary Industries Priorities for Action: Victoria's Meat Industries	2004-2008	<ul style="list-style-type: none"> <li>Improving productivity and sustainability of meat production systems</li> <li>Reducing environmental impacts and enhancing ecosystems</li> <li>Developing markets and value chains</li> <li>Increasing community engagement and participation in change</li> <li>Enhancing DPI capability</li> </ul>	<ul style="list-style-type: none"> <li>Improved &amp; more sustainable meat production systems to increase on-farm productivity by at least 10%</li> <li>Improved environmental and ecosystem amenity associated with meat production</li> <li>Assured safety of all meat products, improved eating quality and more efficient processing technologies</li> <li>Increased prosperity of meat producers. By addressing the barriers to adoption of technologies</li> <li>Improved skills within DPI to provide leadership</li> </ul>
Department of Primary Industries Water and Environment in Tasmania – Corporate Plan	2004-2006	<ul style="list-style-type: none"> <li>Facilitating sustainable management of natural resources</li> <li>Creating opportunities through water development</li> <li>Achieving a health and clean environment</li> <li>Expanding access to land information</li> <li>Minimising the impact of pests, weeds and diseases</li> <li>Validating our clean and green image and facilitating sustainable development in Tasmania</li> </ul>	<ul style="list-style-type: none"> <li>Provision of skills, resources, networks and information to enable the community to become involved in sustainable management of natural resources</li> <li>Make water usage more sustainable and increase availability of water for communities and industries while fostering input into water planning and management</li> </ul>

## Appendix 2: Summary of various industry body strategies

Organisation	Period of plan	Relevant major areas of focus	Measures/outcomes
Department of Agriculture Western Australia	2003-2013	<ul style="list-style-type: none"> <li>• Production efficiency and growth</li> <li>• Value added products</li> <li>• Service delivery</li> <li>• Environmental stewardship</li> <li>• Biosecurity</li> <li>• Capacity</li> <li>• Market confidence</li> </ul>	<ul style="list-style-type: none"> <li>• Develop a cleaner environment and promote sustainable industry practices</li> <li>• Develop the land information system Tasmania</li> <li>• Develop industry action partnerships to promote investment, competition and innovation and ensure sustainable natural resource development</li> <li>• An agriculture sector with access to most effective products, processes, technologies and services</li> <li>• Capture additional wealth through differentiation and increase the value of raw produce.</li> <li>• Utilising the most appropriate technology to ensure efficiency</li> <li>• Ensuring environmental benefits are realized and risks minimised</li> <li>• An ability to manage biosecurity risks</li> <li>• A sector which is entrepreneurial with highly skilled management and workforce</li> <li>• High level of consumer and market confidence in the quality, safety and production of WA food.</li> </ul>
South Australia Beef Industry Strategy	2005-2015	<ul style="list-style-type: none"> <li>• End users of beef products</li> <li>• Implementing responsible production systems on a reduced land base</li> <li>• Efficient processing and distribution systems</li> <li>• Strong industry partnerships, committed people and a positive image</li> <li>• Integration throughout the value chain.</li> </ul>	<ul style="list-style-type: none"> <li>• 30% increase in exports</li> <li>• 5% increase in domestic consumption in South Australia</li> <li>• 15% increase in production on a 10% reduced land base</li> <li>• 40% increase in total processing</li> <li>• Knowledgeable and skilled workforce</li> <li>• Close relationships between producers and processors</li> </ul>
South Australian Sheep Industry 10 year Strategic Plan	2004-2014	<ul style="list-style-type: none"> <li>• Support production systems to secure long term involvement of industry in profitable, secure markets and products</li> <li>• Ensure SA Sheep Industry is a competitive and attractive investment for breeders, producers, processors and manufacturers.</li> <li>• Internationally competitive abattoirs and processing facilities</li> <li>• Foster uptake of innovation in production and processing</li> </ul>	<ul style="list-style-type: none"> <li>• Volume of production target 160m kg by 2012, number of lambs in annual production target 3.7m</li> <li>• Increased per unit return feed and water use efficiencies</li> <li>• Percentage of industry implementing identity trace back and environmental management systems</li> <li>• Number of people directly and indirectly employed.</li> <li>• Investment in processing enterprises.</li> </ul>

## Appendix 2: Summary of various industry body strategies

Organisation	Period of plan	Relevant major areas of focus	Measures/outcomes
Australian Wool Innovation Strategic Plan	2004-2009	<ul style="list-style-type: none"> <li>• Positive relationship between industry and community re use of environmental management</li> <li>• Build upon R&amp;D and training skills for future needs.</li> <li>• Profitable grazing for wool sheep</li> <li>• Natural resource management</li> <li>• Animal health and welfare</li> <li>• Applied animal molecular genetics</li> <li>• Wool harvesting</li> </ul>	<ul style="list-style-type: none"> <li>• Increase pasture productivity by 20%</li> <li>• New tools to reduce cost of production by 5% and increase sustainability of grazing systems</li> <li>• Australian wool growers demonstrating their environmental credentials and positive impact on environment</li> <li>• Healthier sheep with more effective control of worms, flies, lice and other diseases with safe procedures and high standard of animal welfare</li> <li>• More rapid genetic gain</li> <li>• Across flock genetic benchmarking system.</li> </ul>
CSIRO Strategic plan	Current	<ul style="list-style-type: none"> <li>• Technologies and systems that will help industry enhance international competitiveness</li> <li>• Ecologically sustainable development</li> <li>• Reduction in risk and consequence of disease outbreaks</li> <li>• Expand market access by product development and researching consumer demand</li> <li>• Enhance efficiency and profitability of the industry</li> </ul>	<ul style="list-style-type: none"> <li>• Protection of Australia's animal health status</li> <li>• Creating new business opportunities by understanding consumer requirements and key markets</li> <li>• Adoption of new management systems that integrate triple bottom line objectives</li> <li>• Adoption of production and processing procedures that minimise undesirable industry impacts</li> <li>• Improved animal performance through improving animals capacity to resist diseases and parasites</li> <li>• Increase production efficiency feed use and more effective feed management.</li> </ul>
Animal Health Australia	2003-2008	<ul style="list-style-type: none"> <li>• Improved awareness of animal health and biosecurity</li> <li>• Improved delivery of animal health services</li> <li>• Improved credibility of animal health surveillance</li> <li>• Improved emergency animal disease and response capability</li> </ul>	<ul style="list-style-type: none"> <li>• Level of awareness of disease risk and mitigation strategies</li> <li>• Australia's animal health system meets international benchmarks and skills capability inventory meets industry needs</li> <li>• Surveillance programs meet market requirements</li> <li>• Ausvetplan accepted and used for emergency animal disease responses.</li> </ul>

## Appendix 2: Summary of various industry body strategies

Organisation	Period of plan	Relevant major areas of focus	Measures/outcomes
Meat & Wool New Zealand	Meat New Zealand Food for the Future 2001-2006	<ul style="list-style-type: none"> <li>Encouraging global leadership in farming systems and practices</li> <li>Keeping markets open for trade</li> <li>Helping position New Zealand beef and lamb as safe, natural, nutritious food.</li> <li>Facilitating new opportunities in bio-actives, functional foods, value added products and co-products</li> <li>Building strong partnerships between Meat New Zealand and other industry participants</li> </ul>	<ul style="list-style-type: none"> <li>Average lambing percentages of 125% and average calving percentage of 92%</li> <li>An increase in average growth rate of between 0.1 and 0.3kg per day</li> <li>Embryo transfer breeding system for cattle</li> <li>Farming systems that allow three lambing cycles every two years</li> <li>A method for identification and treatment of Johnne's disease</li> <li>More cost effective and natural tools for farming systems</li> <li>Release of at least 2 gene based marker assisted selection applications</li> <li>80% of registered levy payers aware of R&amp;D projects relevant to them</li> <li>People with appropriate skills and training available to the industry</li> </ul>

### Other Strategic Plans consulted

The Grains Industry Strategic Plan 2003	Australian Sheep Industry CRC 2003–2008
Australian Pork Limited Strategic Plan	Beef Genetic Technologies CRC prospectus
Rural Industries Research and Development Strategic plan 2002–2005	Tropical Savannas CRC—2003–2007
Grains Research and Development Corporation —Five year plan driving innovation	Plant-based Management of Dryland Salinity CRC 2003–2008
Land & Water Australia Strategic R&D Plan	
Dairy Australia Strategic Plan	
Strategically positioning the Australian Sheepmeat Industry for the year 2005 (Sheepmeat Council of Australia)	
Beef Industry Strategic Plan 2002–2007	
Weeds CRC Strategic Plan 2004–2008	
Australian Biosecurity CRC 2003–04	

## Appendix 3: An analysis of the relative impact of R&D investment for different drivers of profitability (extract)

### Summary

As part of the planning for the period 2006–11, Meat & Livestock Australia has used an objective methodology to evaluate R&D areas that could affect productivity outcomes for Australian red meat and livestock producers. This was done using an enterprise profit analysis and technology adoption model (the Rendell-McGuckian Enterprise Financial Outcome and Adoption Estimation Model). The analysis provides an estimate of the size of benefits achieved by developing technologies or tools that producers can use to make productivity improvements, and thus provides information that can help prioritise areas of R&D investment by outcome.

### Methodology

#### Use of the Rendell-McGuckian Enterprise Financial Outcome and Adoption Estimation Model.

This model incorporates a profit map for each of the following enterprises – northern beef, southern beef, fine-wool sheep, pastoral zone sheep, medium-wool sheep, and terminal sire lamb operations, where the financial and physical parameters for each are based on recent ABARE statistics.

The user can modify levels of various parameters such as production levels and input costs that might result from a new technology developed via R&D, and obtain an estimate of the impact on gross margin per AE (Adult Equivalent, the measure of feed requirements used for northern beef enterprises) or DSE (Dry Sheep Equivalent), and then, by assessing degree of difficulty, risk and other factors affecting likely adoption, obtain an estimate of the adoption pattern for the technology leading to the modelled outcome. Finally, by including values for R&D and partner investment, the model calculates industry level outcomes such as Net Present Value and benefit:cost ratio for the overall investment.

Outcomes have been modelled for a range of productivity parameters. Results include estimated adoption, benefit per AE (or DSE) and per business adopting, as well as Net Present Value and benefit:cost ratio. In all cases, a 5-year R&D program of \$300,000 pa was assumed, with MLA contributing \$100,000 pa and partners \$200,000 pa. This investment level and split is purely arbitrary. For the NPV calculation, a discount rate of 7% was used.

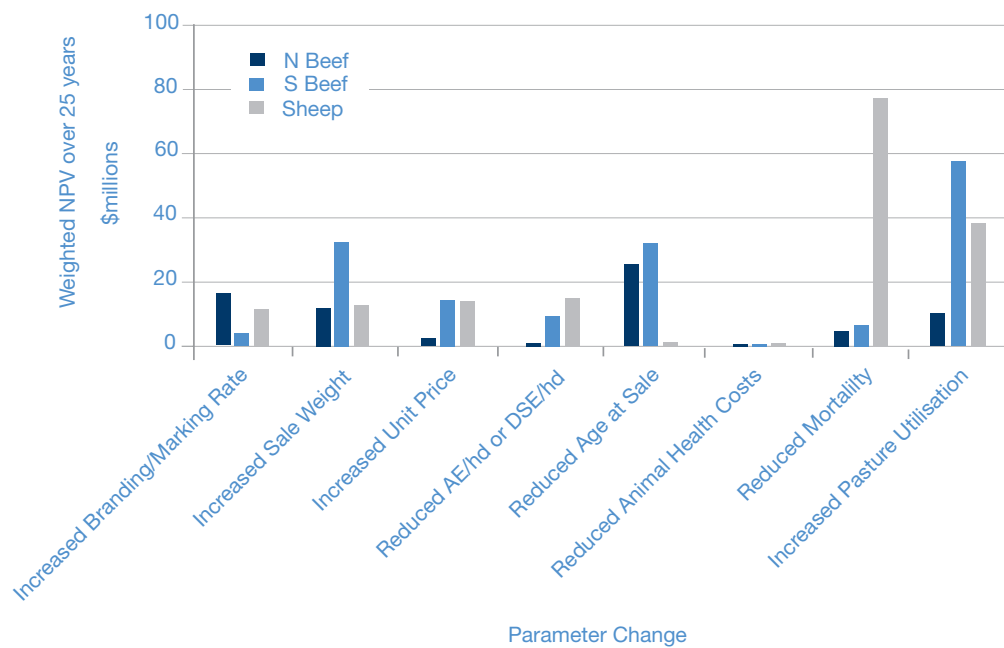
Various adoption profiles were modelled along with the following outcomes:

- **Increased branding/marking rate**—increased by 1%
- **Increased sale weight**—increased by 1%
- **Decreased sale age**—reduced by 1%.
- **Increased unit price**—increased by 1%.
- **Decreased feed requirements**—reduced by 1%.
- **Decreased mortality**—reduced by 1%.
- **Reduced animal treatment costs**—reduced by 1%.
- **Pasture utilisation**—assuming a 1% increase in carrying capacity, a 1% increase in fertiliser costs, and increases in cow/ewe numbers to keep the overall stocking rate constant.

### Results

The following weighted net present value results were found for each outcome.

### Weighted NPV Outcomes by Industry and Parameter Change



#### Beef enterprises

For beef enterprises, outcome rankings are consistent with those developed in the planning of the existing 5-year R&D plans for northern and southern beef. In both southern and northern beef enterprises the best predicted outcomes were provided by increased branding rate, increased sale weight and/or reduced age at sale, increased unit price and reduced feed costs per head. In addition, in southern enterprises, improved pasture utilisation provided the largest predicted benefits.

#### Sheep enterprises

For sheep enterprises, outcomes rankings are also consistent with previous industry R&D targets, but the analysis has highlighted the value of improved pasture utilisation and reduced adult mortality for sheep enterprises, in addition to increased sale weight.

Different sheep enterprises have been modelled—fine-wool, medium-wool, pastoral and terminal sire, and the modelled outcomes in some cases differ significantly between enterprises.

For a full copy of this paper written by Dr. Robert Banks please send a request to [onfarm@mla.com.au](mailto:onfarm@mla.com.au)

## Drivers of on-farm profitability assessed using Rendell McGuckian economic model and ranked according to likely overall benefit

Profit driver	Parameter (change by 1%)	NPV (7%)	Achievable multiple of 1% parameter change in 5 yrs	Likely adoption in 5 years	Predicted Benefit to industry weighted by no. producers	Likelihood of a technical solution (100=Excellent)	Weighted NPV
		(\$m)			(\$m)	New frontier research	(\$m)
<b>Northern Beef</b>							
<b>Revenue</b>							
No of animals	Increased Branding /Marking Rate	54	5	15%	24.9	70%	17.4
Kgs per animal	Increased Sale Weight	73	1	80%	30.7	40%	12.3
Price per Kg	Increased Unit Price	73	1	40%	15.4	20%	3.1
Kgs per animal	Reduced Age at Sale	19	10	50%	64.9	40%	26.0
No of animals	Reduced Mortality	19.9	2	60%	16.9	30%	5.1
<b>Costs</b>							
Variable costs	Pasture utilisation	70	10	5%	10.8	80%	8.6
Variable costs	Reduced AE/hd or DSE/hd	41	0.5	30%	3.7	20%	0.7
Variable costs	Reduced Animal Health Costs	6	1	20%	0.9	20%	0.2
<b>Southern Beef</b>							
<b>Revenue</b>							
No of animals	Increased Branding /Marking Rate	55	4	20%	17.6	25%	4.4
Kgs per animal	Increased Sale Weight	68	4	80%	81.7	40%	32.7
Price per Kg	Increased Unit Price	68	3	50%	38.3	40%	15.3
Kgs per animal	Reduced Age at Sale	63	10	30%	74.3	40%	29.7
No of animals	Reduced Mortality	40.5	1	100%	16.8	40%	6.7
<b>Costs</b>							
Variable costs	Pasture utilisation	102	20	25%	116.4	50%	58.2
Variable costs	Reduced AE/hd or DSE/hd	59	3	50%	34.1	35%	11.9
Variable costs	Reduced Animal Health Costs	12	1	10%	0.5	20%	0.1

Drivers of on-farm profitability assessed using Rendell McGuckian economic model and ranked according to likely overall benefit

Profit driver	Parameter (change by 1%)	NPV (7%)	Achievable multiple of 1% parameter change in 5 yrs	Likely adoption in 5 years	Predicted Benefit to industry weighted by no. producers	Likelihood of a technical solution (100=Excellent)	Weighted NPV
		(\$m)			(\$m)	New frontier research	(\$m)
<b>Lamb &amp; Sheepmeat</b>							
<b>Revenue</b>							
No of animals	Increased Branding /Marking Rate	53	5	25%	26.4	50%	13.2
Kgs per animal	Increased Sale Weight	101	4	80%	20.4	40%	8.2
Price per Kg	Increased Unit Price	33	5	50%	34.3	40%	13.7
Kgs per animal	Reduced Age at Sale	2	4	20%	1.2	40%	0.5
No of animals	Reduced Mortality	104	5	40%	130.3	60%	78.2
<b>Costs</b>							
Variable costs	Pasture utilisation	230	10	25%	98.0	40%	39.2
Variable costs	Reduced AE/hd or DSE/hd	26	4	30%	45.4	35%	15.9
Variable costs	Reduced Animal Health Costs	2	2	10%	0.2	10%	0.0

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