
**DAIRY AUSTRALIA**

**SUBMISSION**

**To**

# PRODUCTIVITY COMMISSION INQUIRY

**Into**

# THE AUSTRALIAN GOVERNMENT RURAL RESEARCH AND DEVELOPMENT CORPORATIONS MODEL

**June 2010**

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## EXECUTIVE SUMMARY

As the industry-owned national service body for the Australian dairy industry, Dairy Australia (DA) welcomes the opportunity to participate in the Productivity Commission review of Rural Research and Development Corporations (RDCs).

Australia has a strong comparative advantage in food production. Even so, the open market oriented nature of Australian agriculture means it must continue to innovate and adapt in order to maintain its positions as a competitive, sustainable supplier of staple foods and as a mainstay of regional Australia.

In recent decades RDCs have played a central role in facilitating effective rural innovation. The RDC system has delivered significant gains to both farmers and to the broader Australian community. It can continue to do so into the future.

This submission aims to demonstrate the essential soundness of the current RDC model through particular reference to dairy's experience. It briefly examines

- The evolution of the RDC model in dairy
- DA's approach to delivering innovation that benefits both dairy producers and the broader Australian community
- The strengths of the current RDC model
- The rationale for continued public funding support for rural RD&E and
- Some future challenges facing RDCs

Our central conclusions are that:

1. There is clear value for both industry and the broader community in continuing the RDC joint investment model.
2. There is a clear industry-specific dimension to meeting agriculture's innovation challenge.
3. In dairy's experience, planning and delivering research, development and extension (RD&E) as part of a closely inter-connected matrix of industry services is crucial to maximise the value and return on industry and government investment.
4. Challenges such as climate change will require increased cross-sectoral collaboration between RDCs and other groups within the broader innovation system. But strong industry-based RDCS still have a key role to play in delivering desired outcomes because of their unique positioning and capacity to translate broad high level knowledge into effective industry-based innovation and solutions.

***An Integrated Approach to Delivering Innovation***

DA delivers its strategic priorities through a portfolio of basic R&D, extension, education and industry service activities (such as information analysis, issues management). An overriding driver is that investments must ultimately deliver clear benefits to levy payers.

The unique integrated nature of dairy production, allows DA to work across the full supply chain identifying areas where it can work collaboratively with business partners to:

- Increase returns or reduce industry costs to build dairy business margins
- Deliver better and faster outcomes than businesses could achieve individually
- Improve understanding of the dynamics and drivers of change across the supply chain, and
- Build industry capability to effectively address this change.

This business model embodies both high levels of governance, stakeholder consultation and engagement. Importantly it also generates strong industry ownership of program outcomes.

DA sees collaboration with other industries and organisations as a key business tool to help deliver cost effective outcomes for stakeholders. It works as a technically informed, commercially minded, investor to provide an effective bridge between research providers and individual dairy businesses. It also regularly pursues collaborative research partnerships as a way of delivering the most cost effective outcomes and returns for Australian dairy producers and society.

**The RDC Model Remains Sound**

The structure and roles of RDCs continue to evolve to match changing industry and community circumstances and needs. But the current RDC model (particularly as it applies to dairy) remains fundamentally sound and effective.

There is a clear industry-specific dimension to Australia's innovation challenge. The close industry linkages of RDCs are critical to ensure the continued relevance of RD&E project outcomes and their successful uptake and impact on farm business bottom lines.

DA's ability to plan and deliver dairy RD&E as part of a closely inter-connected matrix of industry services is a key strength of the dairy RDC model. This inter-connection allows the development and implementation of R&D based on a clear understanding of market and policy drivers and how they may affect potentials return on R&D investment.

The effective conversion of government and industry based R&D investment into profitable, sustainable farm and manufacturer practices requires both close alignment between researchers and industry stakeholders and a strong understanding of industry business models and the drivers of profit and resilience. The unique technical capabilities and positioning of RDCs is pivotal to this partnership process and is a cornerstone of successful innovation.

**Public Funding of RD&E Should Continue**

Independent studies show that the outcomes of rural RD&E have generated significant benefits both to industry and to the Australian community through productivity growth, higher living standards and a wide range of social and environmental spillovers. These gains are inextricably linked and warrant ongoing public contribution towards rural RD&E.

Continued productivity growth will be essential to meet the food and nutrition challenges posed by world population growth and climate change. Substantial ongoing investment in rural innovation will be required to secure step ups in productivity growth.

The current rural levy framework has not removed all market failure risks in relation to rural RD&E. Government co-contributions play an important role in addressing these risks. Therefore changing the basis of current co-contribution arrangements could exacerbate rather than reduce the risk of market failure.

**New Challenges require both Cross-Sectoral Collaboration and Industry Expertise**

Rural RDCs must continue to evolve and adjust to changes in the circumstances of the industries they serve and across the broader community.

Multi-faceted challenges like climate change require agricultural groups to identify how farm and food manufacturing systems interact with a much broader range of social, economic and policy drivers. Agriculture must also engage with a broader cross–section of government.

With their strong positioning in the rural innovation system, RDCs can play a key role in helping to coordinate effective responses to these emerging cross-sectoral challenges. Effective action will also require strong, industry-based RDCs that are able to interpret and translate broad, high-level knowledge into industry specific innovation and farm-based solutions.

# 1 Introduction

Dairy Australia (hereafter referred to as DA) welcomes the opportunity to present this submission to the Productivity Commission review of Rural Research and Development Corporations (or RDCs).

DA is the industry-owned national service body for the Australian dairy industry. It was formed in 2003 to flexibly drive a range of innovation and service activities that would support a profitable, competitive and sustainable Australian dairy industry.

In its service role DA has taken on a range of service support roles that were previously undertaken by two statutory bodies - the Australian Dairy Corporation and the Dairy Research and Development Corporation – and other industry bodies.

DA operates as a company limited by guarantee under Corporations law. It is fully accountable to its members who comprise:

- levy paying dairy farmers who choose to become direct members, and
- the peak industry bodies that represent dairy farmers and the dairy processing sector (Australia Dairy Farmers Limited and the Australian Dairy Products Federation).

DA is recognized as the national Industry Services Body for the dairy industry under a funding agreement with the Commonwealth Government. This agreement sets out the basis on which DA can receive industry levies and matching government contributions and the broad scope of service and research activities that it can undertake on behalf of industry (and the broader community) with these funds.

While the Government has established quite broad terms of reference for this review the key issues on which the Commission has been asked to report appear to be:

- The effectiveness of the current RDC model in improving competitiveness and productivity in agriculture through research and development;

- The appropriateness of current funding levels and arrangements for agricultural R&D, particularly levy arrangements, and Commonwealth matching and other financial contributions to RDCs;

- How RDCs interact with other research and development arrangements including universities, cooperative research centres and other R&D providers;

- The extent to which RDCs provide an appropriate balance between projects that provide benefits to specific industries versus broader public interests; and

- Whether current levy arrangements address free rider concerns in relation to rural R&D and the implications this has for Government investment.

This submission focuses primarily on these issues. It also considers some of the future challenges facing the broader RDC model.

Given DA's broad service charter, two preliminary comments are warranted.

First, while RDCs share many common characteristics (e.g. most are industry based and levy funded) there is a diverse range of RDC models operating across Australian agriculture and food production.

In this inquiry, DA is classified as one of nine industry-owned rural RDCs. But **DA's charter, structure and operating systems differ considerably from some other industry-based RDCs.** This partly reflects the closely integrated nature of the dairy production system. It also reflects the fact that the current dairy service model has evolved over many decades to address dairy specific challenges and needs. DA's current objectives embrace a flexible approach to advancing dairy and community interests with RD&E being one means DA can use to achieve desired outcomes.

The close integration of dairy farming and manufacturing means that in fulfilling its charter DA does not limit its investment to farm level RD&E. Instead **it works across the full dairy supply chain** – from pre-farm through to final consumption markets – identifying areas where it can work collaboratively with business partners to:

- Increase returns or reduce industry costs to build dairy business margins
- Deliver better and faster outcomes than businesses could achieve individually
- Improve understanding of the dynamics and drivers of change across the supply chain, and
- Build industry capability to effectively address this change.

**DA's business model recognises that innovation delivered through effective RD&E is a key tool in maintaining industry competitiveness and sustainability.** It also recognises that not all the challenges facing Australia's food industry can be addressed solely through R&D. This is particularly true with emerging, broadly-based challenges such as climate change.

In these cases, effective R&D will form part of the necessary response by industry and government. **The value delivered through additional R&D is likely to be greatest when it is integrated within a matrix of complementary industry service activities and roles** (including knowledge management, situation analysis and forecasting, education, training, risk management and communication).

From a DA perspective, the close integration and balancing of knowledge gathering with other service functions is pivotal to delivering effective and sustainable dairy industry outcomes.

These factors suggest that, in drawing conclusions from this review, it will be important to ensure that recommendations made in relation to the RDC model recognize:

- the diversity that exists within the current RDC framework, and

- the implications that changes in R&D funding arrangements may have on the viability and effectiveness of other service elements embodied within the rural RDC model.

**Box A : The Australian Dairy Industry A Snapshot**

The dairy industry is one of Australia's major rural industries. Its farmgate value of production of around $4 billion ranks third behind the beef and wheat industries. Dairy is also one of Australia's leading rural industries in terms of adding value through further downstream processing, with an estimated ex-factory value of production of over $11 billion. Much of this processing occurs close to farming areas, thereby generating significant economic activity and employment in country regions. ABARE estimates that the regional economic multiplier effect of the dairy industry's operation is around 2.5.

About 40,000 people are directly employed on dairy farms and manufacturing plants (mainly in regional Australia). Significant additional jobs are generated through dairy related activities in transport, distribution, marketing, RD&E and service provision.

Dairying is established across all temperate and some subtropical areas of Australia. The bulk of milk production occurs in the south-east corner of the country – some 80% in the three states of Victoria, South Australia and Tasmania – but all states have dairy industries that supply fresh drinking milk to nearby cities and towns. A range of high-quality consumer products, including fresh milks, custards, yogurts and a wide variety of cheese types are produced in most Australian states. The manufacturing and export of longer shelf life products, such as cheese, butter and specialised milk powders, has progressively become concentrated in the south-east region of Australia.

**Dairy facts and figures 2008/9**

| | |
|---|---|
| National dairy herd | 1.6 million cows |
| Average Herd Size | 200 cows |
| Milk production | 9,388 million litres |
| Average annual milk production per cow | 5,750 litres |
| Dairy - Australia's 3rd largest rural industry | $4.0 billion value at farm gate |
| Dairy - major value-added food industry | $11.9 billion value at wholesale |
| Milk Utilisation | Cheese 33%<br>Drinking milk 24%<br>SMP/butter 25%<br>WMP 12%<br>Casein/butter 4%<br>Other 2% |
| Dairy - major export industry | $2.9 billion<br>9% of world dairy trade |
| Percentage of Aust milk production – exported | 43% |
| Major markets for Australian dairy products - tonnes | Australia 2,604,000<br>(including 2,178,600 tonnes of drinking milk)<br>Japan 106,000<br>Singapore 76,300<br>Malaysia 80,000<br>China 61,300<br>Philippines 50,000 |
| Per capita consumption | Drinking milk 104 litres<br>Cheese 12 kilograms |

# 2 The Dairy RDC Model.

The following section seeks to assist the Commission develop its understanding of the effectiveness and value of the RDC model by providing a detailed overview of the structure and operation of Dairy Australia (DA) - the recognised RDC for the Australian dairy industry.

## 2.1 Background

DA is a relatively new organization, having been formed in 2003 to flexibly drive a range of innovation and service activities that would support a profitable, competitive and sustainable Australian dairy industry.

The Australian dairy industry has a long history of working collectively to achieve its objectives of building and maintaining a profitable, innovative and sustainable industry that contributes positively to the welfare of the Australian community. **DA's structure and role, therefore, have evolved in line with dairy's experience of, and learning from, collective industry action over more than 80 years.** (See Box B for details).

From its formation DA took over a range of service support roles that had previously been carried out by two statutory bodies - the Australian Dairy Corporation (ADC) and the Dairy Research and Development Corporation (DRDC).

The ADC was the statutory marketing authority for the Australian dairy industry. It operated for over 70 years (in different forms) undertaking a range of national service roles including trade policy, marketing, promotion, information collection and analysis. The ADC also fulfilled various regulatory roles for the Australian government.[1]

The DRDC was the joint industry/government vehicle set up to fund and manage dairy related RD&E under the Primary Industries and Energy Research and Development (PIERD) Act of 1989. Like the ADC, the DRDC replaced previous structures that were in place since the 1950s (the Dairy Research Committee and Council). It operated essentially on a funder /supplier model (i.e. each year the DRDC sought applications for R&D projects from prospective research groups and funded those that met its approved strategic directions and budget).

Following the deregulation of all dairy marketing arrangements in 2000 support grew across the dairy sector to bring together the service activities that were being carried out by different bodies[2]. Negotiations with the Australian government led to the formation of Dairy Australia as an industry-owned and funded entity in June 2003.

In addition to the core industry service functions of the ADC and DRDC, DA also took on several technical support functions that were previously undertaken by national representative bodies.[3]

[1] The most recent example being management of the Dairy Structural Adjustment Fund

[2] The Advancing Australian Dairy report, for example, argued that industry needed to take responsibility for its future

[3] These included managing Australia's membership of the International Dairy Federation and managing various animal health and residue monitoring initiatives (previously roles carried out by the Australian Dairy Industry Council).

## 2.2 DA's Business Objectives and Funding Model

DA's objectives under its constitution are:

a) To promote the development of Australian dairy resources, and

b) To contribute to the promotion and development of the Australian dairy industry and Australian dairy produce by
   i. Carrying out research, development and extension activities for the benefit of the Australian dairy industry and the Australian community generally, and
   ii. Carrying out activities to develop the Australian national market for, and international trade in, Australian dairy produce, and
   iii. Providing information and other services, and
   iv. Carrying out other activities for the benefit of the Australian Dairy industry, and

c) To act as an industry services body for dairy for the purposes of the Dairy Produce Act.

DA operates as a company limited by guarantee under Corporations Law. It is governed by an independent skills-based Board but remains fully accountable to its two classes of industry members:

- (Class A) levy paying dairy farmers who choose to become members, and
- (Class B) the national peak industry bodies that represent dairy farmer and dairy processing and distribution interests (the ADF and ADPF).

DA's Board members are elected by votes of Class A members at annual general meetings. This structure provides farmers, as members, with an effective and direct say in the organisation's activities. DA's constitution requires it to actively consult with its Class B members on strategic priorities and plans. DA strongly supports this, as it sees active consultation with key stakeholders as key to ensuring there is strong understanding and alignment between the company and its industry partners both in understanding what are the emerging challenges facing the sector and what, if any, is the most appropriate role for industry-level action in dealing with them.

DA funds it operations from two primary sources:

1. A levy charged on the fat and protein content of all milk delivered off farm (the Dairy Services Levy), and

2. Co-contributions from the Australian Government in the form of matching payments on DA investments in approved RD&E activities. The scope of what constitutes an eligible R&D activity is set out in DA's funding agreement[4].

[4] R&D is essentially systematic experimentation and analysis in fields of science, technology business or economics with the aim of acquiring knowledge that may further an objective of the industry and the application of that knowledge. It can include the training of people to undertake R&D, and disseminating, adapting and commercialising the results of R&D.

**Box B: 85 Years of Dairy Collective Action**

Key milestones in Australian dairy's history of collective service action include:

**1925** Formation of the Australian Dairy Produce Control Board (later renamed **Australian Dairy Produce Board (ADPB)** to collectively manage marketing and sale of manufactured dairy products in Australia and export markets.

**1930s** **ADPB** invests industry funds in dairy based R&D by direct funding of projects
**1940s** undertaken by universities, colleges and later, CSIRO.

**1958** At industry request, Australian government establishes the **Dairy Industry Research Scheme (DIRS)** providing formal funding base for ongoing dairy R&D. The Scheme imposes levy on the butter fat content of manufactured products, and provides for matching government funding for industry R&D outlays. The **Dairy Produce Research Committee** (**DPRC) is** set up to administer the scheme, with focus on manufacturing R&D (DPRC has representative Board from industry, government, CSIRO and ADPB)

**1972** Following further industry requests DIRS coverage extended to entire dairy value chain. Funding base amended, with industry contribution now based on levy on farm gate milk production. **Dairy Research Committee** restructured to include farm representatives.

**1975** ADPB replaced by **Australian Dairy Corporation.** ADC continues range of industry service and regulatory functions.

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**1985** **Rural Industries Research Act** restructures funding and charters of rural research bodies. **Dairy Research Council (DRC)** established with greater autonomy over investments. DRC run by independent skills-based board. Government urges industries to invest more in R&D.

**1989** **Primary Industries and Energy Research and Development Act** passed, setting up RDC joint partnership model between government and industry to deliver agricultural research. **Industry agrees to progressively double the rate of research levy in recognition of need for joint action**

**1990** **Dairy Research and Development Corporation (DRDC)** set up as dairy RDC. Primarily operates on funder supplier model, i.e. funding applications for R&D that match its strategic priorities.

**1994** First letter from Minister to RDCs setting out **government priorities** that RDCs should take account of in preparing their R&D plans. Subsequent Ministerial letters on priorities follow in 1997and 1999.

**2000** Following deregulation of dairy industry price, industry seeks amalgamation of all industry services activities within one industry-based organisation.

**2003** **Dairy Australia** set up as national industry-owned Industry Service Body

DA can also earn income from interest on its financial reserves[5], royalty payments on Intellectual Property Rights generated by previous research and from direct funding by external bodies. Further contributions are received through in-kind contributions made by DA's collaborative business partners.

Dairy Services Levy receipts[6] represent, on average, just over 60% of DA's annual income. Government matching contributions of DA expenditure on RD&E activities represent between 30-35% of annual income while funds from other sources account for 5-10% of DA income.

There are two important differences in DA's funding arrangements relative to its predecessor bodies.

The first is that all Australian dairy farmers must periodically (every 3-5 years) be given the opportunity to vote on the rate of the Dairy Services Levy that should apply to their milk production. The first Dairy Services Levy Poll was held in February-March 2007 and saw 68% of the vote in favour of retaining the current levy rate[7].

Secondly, up to 2003 the PIERD Act allowed the DRDC to receive Australian government contributions to match direct contributions for R&D that had been made by local farmer owned co-operative companies. While this arrangement helped facilitate and encourage joint post-farmgate research and development in dairy, the provision was withdrawn when the DRDC research function transferred to DA.

## 2.3 How DA Implements its Objectives

Given its objectives and funding DA's primary role is to drive industry services and innovation to the ultimate benefit of levy paying dairy farmers.

At the same time it acknowledges the important role that the Australian government plays in underpinning its funding base and the importance of direct investment by federal and state governments in key infrastructure that supports effective RD&E across Australian agriculture and food production.

Therefore **in implementing its objectives DA works closely with federal, state and regional government agencies** to ensure that its strategies align with government research and development priorities and can deliver desired outcomes for both industry and the broader Australian community. As Figure 1 shows DA's activities in support of dairy industry interests fit well with current Australian Government R&D priorities.

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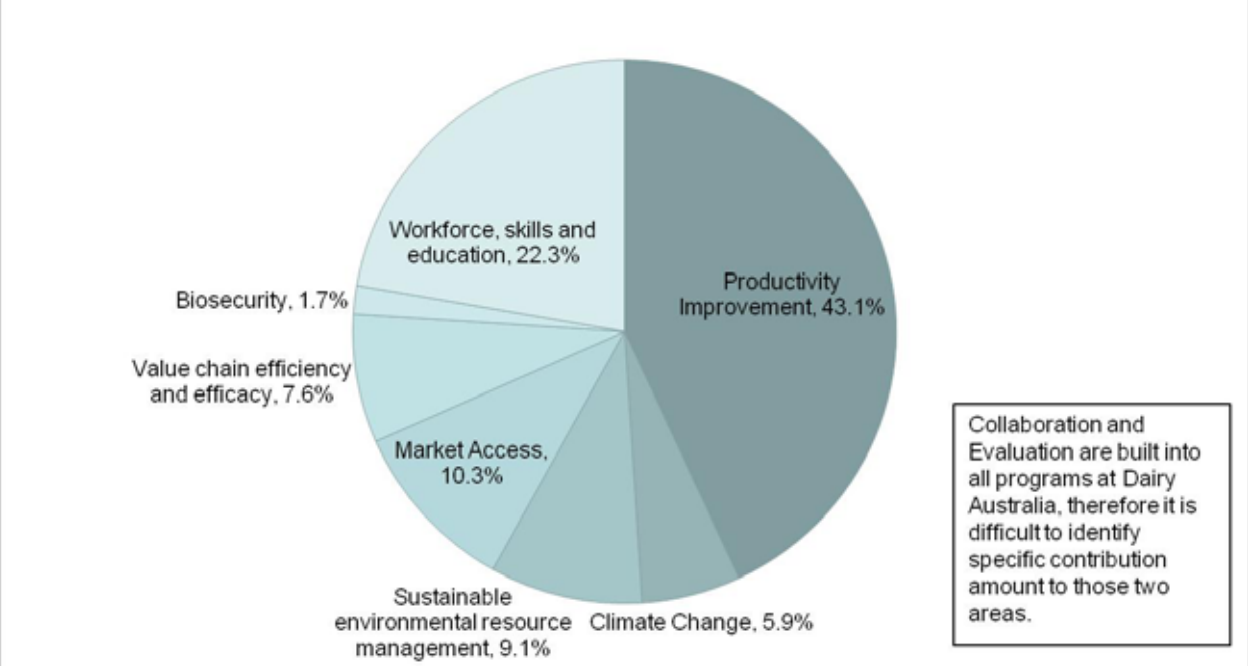
[5] DA's Board has set a minimum level of financial reserves ($12 Million adjusted annually for inflation) that they wish to see retained by DA to ensure that the company maintains the capacity and flexibility to assist with unexpected industry crises or obligations.

[6] The current rate of the Dairy Services Levy is 2.6075 c/kg milk fat and 6.3558c/kg protein contained in delivered milk (which equates to 4.28 cents / kilogram of delivered milk solids).

[7] Participation in all levy polls is voluntary with individual farmers' voting rights based on the dollars of levy paid. The turnout in the 2007 poll - 53% of eligible votes were cast - was high considering the nature of the poll (a voluntary postal ballot).

**Figure 1: DA Expenditure – Alignment with National Research Priorities 2010**




In its current Strategic Plan Dairy Australia has identified five inter-linked strategic priority areas in which it will work to support an innovative, sustainable and profitable dairy industry. These are to:

1. Enhance the adaptive capability of the supply chain to boost business margins and growth opportunities

2. Proactively promote and protect dairy's value and integrity

3. Coordinate an integrated supply chain response to climate change and natural resource management

4. Promote and protect the health and nutrition benefits of dairy products and ingredients , and

5. Enhance the skills and capability within dairy to address the increased complexity of dairy production systems and business decision making.

Two factors have an important bearing on DA's approach to addressing these strategic priorities. These are:

- **The integrated nature of dairy production and**
- **DA's broad industry service charter**

In practice, milk produced on farm in Australia can only be sold for human consumption after it undergoes some processing. To be profitable, farm businesses need manufacturing firms that can buy and efficiently process milk and sell it to satisfied consumers. Conversely, milk processing efficiency depends on firms having access to

reliable, sustainable supplies of fresh milk. Both segments of industry need strong domestic and international markets, ready access to innovation and continued community support in order to grow and prosper.

**Successful dairying, therefore, is built on a base of strong collaboration[8].** DA works across the entire supply chain (usually in conjunction with other partners) to facilitate profitable partnerships and collective action using industry funds, resources and expertise to both meet critical industry needs and broader community and government expectations around dairy. This process strongly involves industry partners in the conceptualisation, design and delivery of the specific interventions that DA makes on industry's behalf.

DA's business objectives also require that it takes a broad approach to promoting the development of the Australian dairy industry and Australian dairy produce.

The Dairy Services Levy effectively represents the amalgamation of three previous levies (Corporation, Marketing and Dairy Research). There were clear rules applying to how money raised under these old levies could be applied. But **under DA's charter there is no requirement that a fixed proportion of Dairy Services Levy income must be directed to specific activities (such as R&D,** extension or other service activities).

Instead, DA can, and does, choose how it directs its funds within the general constraint that funded activities must be consistent with both its corporate objectives and with the Australian Government's national research priorities.

This flexibility greatly enhances DA's service delivery as it allows it to adjust its program mix and profile in line with changes in industry conditions and circumstances. DA can alter the balance of effort between R&D and other service roles, both across strategic priorities and over time.

In practice DA has chosen to address each of its current strategic priorities through a portfolio of basic R&D, extension and education combined with other industry service activities.

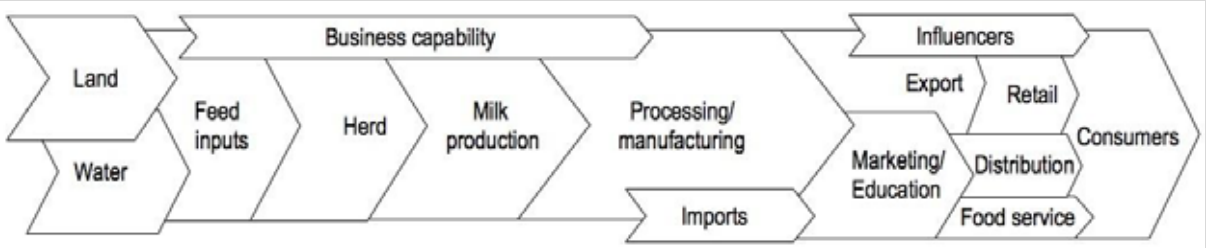
Box C provides an example of this approach. Figure 2 provides a breakdown of DA's budgeted expenditure in 2009/10 by strategic priority. It further breaks down this expenditure down between RD&E and other service activities. As this indicates, at present a much greater focus is being placed on developing new knowledge via R&D to help farm businesses adjust in areas such as climate change, NRM and skills and capacity development. This pattern is quite likely to change as the challenges facing dairy evolve in coming years.

[8] The integrated and collaborative nature of dairying is also reflected in its unique industry representative structure (with the industry's peak body the Australian Dairy Industry Council jointly representing the interests of the dairy farm, manufacturing and distribution sectors

**BOX C A Portfolio Approach**

**Strategic priority**

*"Enhancing the adaptive capability of the dairy supply chain to boost business margins and growth opportunities"*



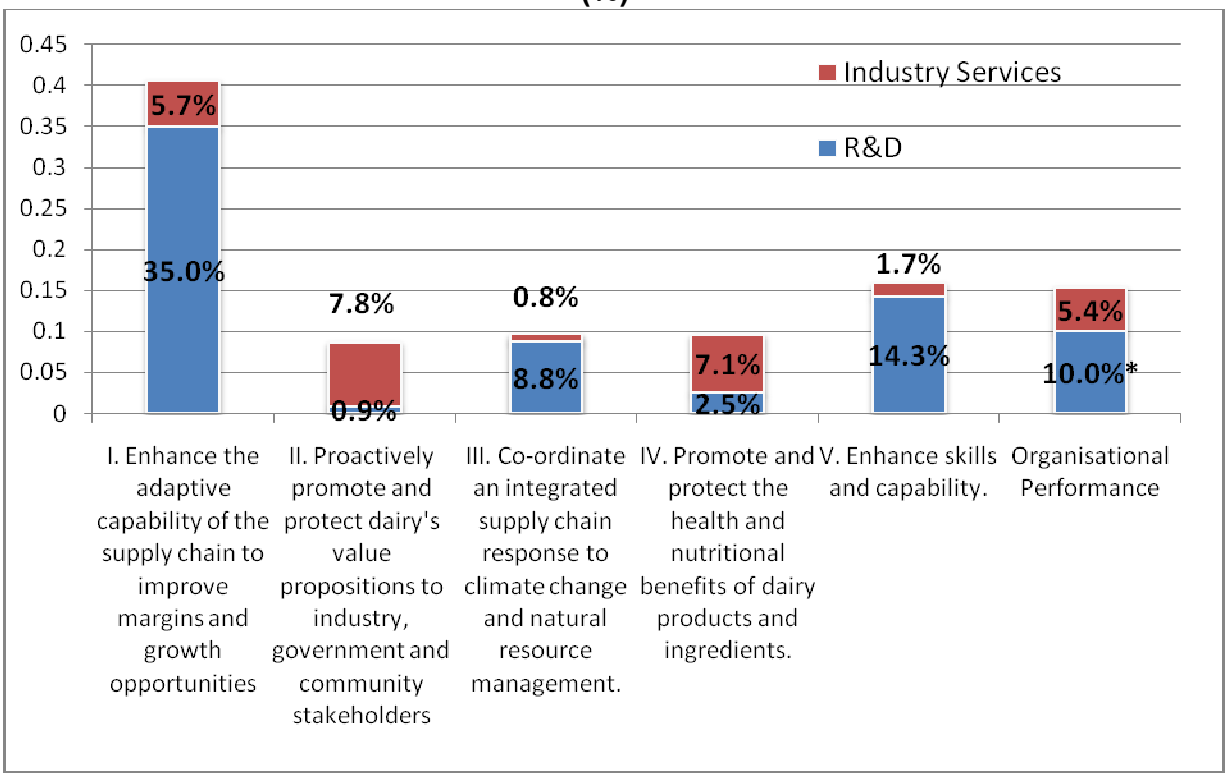

**Programs**

Productivity research
- feed base
- animal genetics
- pasture improvement
- farm business systems

Pre-competitive manufacturer aligned R&D

Trade Policy Support
Information collection
Market research
Scenario forecasting
Domestic marketing
International marketing

**Figure 2: DA Expenditure by Strategic Priority and Type of Spend 2009/10 (%)**




Since 2003 DA has invested about 2/3rds of its total outlays on eligible RD&E activities (i.e. those that are eligible for government matching funds). In practice **DA spend on R&D has generally also been higher than the maximum amount that can be matched by the Australian government under the current funding formula** that caps matching fund contributions at 0.5% of an industry's gross value of farm gate production.

DA's portfolio approach to service investment is logical given that activities such as R&D, trade policy support or information gathering are not ends in themselves. Rather they are important tools that can support the cost-effective delivery of desired industry and social outcomes.

**Often R&D and other service activities** (such as policy advice, information and communication) **have complementary roles in delivering specific improvements in industry productivity** or in maintaining dairy's position as a well-regarded, sustainable producer of a key staple food  Box D presents some examples of these complementary roles and synergies.

**Therefore, DA's ability to plan and deliver dairy-based RD&E as part of a closely inter-connected matrix of industry services is a key strength of the dairy RDC model**.

**Box D:  Synergies in Service Delivery**

Maintaining dairy's status as essential within a balanced diet requires more than the accumulation of sound scientific evidence on the health benefits of calcium and other dairy nutrients.  It also requires effective communication of these facts to relevant policy makers, health opinion leaders and the education of final consumers.

Farm research into improving feed conversion efficiency needs to take account not only of how changes in feed regimes may affect farm level milk yields but also final their effects on manufactured product yields, product functionality characteristics and the potential impacts of such changes on final market demand, trade or prices.

Addressing emerging social concerns around production ethics (e.g. animal welfare, water use efficiency) may be less about developing new knowledge than about ensuring that key stakeholder groups have a sound understanding of existing industry practices and performance benchmarks (and ensuring these align with rational community expectations

The co-location of industry R&D and service activities within the one organisation can yield synergies even in areas where the crossovers between different work programs are not obvious. For example, the National Health and Medical Research Council's current review of national dietary guidelines incorporates a discussion proposal that the recommended daily intake of foods like dairy should be reduced from the currently recommended 3 serves per day to reflect the sustainability of current farm production systems.  Given that domestic consumption accounts for around 60% of current airy sales, such a recommendation, if implemented, would have significant ramifications for the dairy industry and regional communities.

DA's structure enabled its Health and Nutrition team to respond quickly and effectively to refute this proposal on industry's behalf by identifying Australian dairy's long history of environmental stewardship, and program results that demonstrate the industry's commitment to providing consumers with nutritious dairy products, in an environmentally, economically and socially responsible manner. Moe details of these programs are presented in Appendix 2.

This inter-connection allows:

- The design and implementation of R&D based on a clear understanding of market and policy drivers and how these may affect the potential return on investment
- The development of farm and post-farm research with a clear understanding of potential flow-on effects to (and from) other parts of the supply chain
- Early identification of emerging capability gaps and pressures and rapid development of strategies to deal with them
- More effective dissemination of research findings to target audiences (be they industry stakeholders, trade partners or the broader community).

### 2.4 DA's Specific R&D Investment Principles

As an open export oriented sector Australian dairy is heavily exposed to both world market movements and changes in consumer attitudes. To maintain the right to produce and market its product on commercial terms the dairy industry must be able to:

- Anticipate key drivers of changes
- Assess their likely effects on industry's position and sustainability
- Develop innovative solutions that make sense to individual businesses, and
- Have this innovation adopted as quickly and broadly as possible.

**There is a clear industry-specific dimension to meeting this innovation challenge.**

The effective delivery of government and industry based R&D investment and its conversion into profitable, sustainable farm and manufacturer practices requires:

- Close alignment between researchers and industry stakeholders
- A strong understanding of industry business models and the drivers of farm profit and resilience within those models, and
- A strong sense of stakeholder ownership based on active engagement in the issues identification and the R&D design phases.

From its beginning DA has worked to meet these challenges by **acting as a technically informed investor** that can provide **an active bridge between** research providers and individual dairy businesses.

In determining its R&D investment against stakeholder agreed strategic objectives, DA applies the following principles:

- Investments must provide "ultimate" benefits to levy payers
- Benefits from investments must be measurable and broader than benefit cost alone
- Collective investment returns should aim to generate significant ROI – unless there are compelling strategic reasons to do otherwise
- The profile of investments in conjunction with industry investment should match that of an internationally innovative industry (including period to realization, risk profile)
- Activities should address "market failure" in the broader sense – i.e. work to achieve desired industry outcomes faster, more efficiently or more effectively

- There must be broad industry acceptance of DA's strategies
- Investment should be objective driven, not historically based
- Value creation must be accompanied by mechanisms to distribute this value
- Investments should allow DA operational flexibility and give it the ability to adjust to changing environments
- Dairy Australia should source alternative funds where the outcomes ultimately benefit the industry as well as the investor, and
- DA should be prepared to invest globally to achieve the highest quality outcomes for the Australian industry.

The following comments are relevant to DA's application of these principles.

***Outcomes Focused R&D***

Like most RDCs DA is essentially a funder rather than a direct provider of research. But it operates very differently to the traditional funder/provider model used by its predecessors.

Traditionally, rural research tended to be supplier driven in Australia (with RDCs identifying high level areas of interest and seeking applications for funding from relevant researchers that complied with these guidelines). The risk of this approach is that research can tend to align with researcher capabilities and interests rather than industry needs. DA takes a more strategic and proactive approach to setting its RD&E agenda. It uses its position as a technically informed investor (and its strong understanding of how dairy systems operate) to identify emerging challenges that are likely to affect industry sustainability and growth. DA then works closely in conjunction with industry stakeholder groups (such as the ADIC) to identify the specific innovation that is likely to best position the dairy industry to meet these challenges.

Having done this DA actively seeks out research partners and other stakeholders who can undertake and deliver the necessary knowledge and/or training.[9] This approach has been important in shaping DA's investment in the past five years in RD&E in areas such as:

- Improving water use efficiency
- Developing automated milk harvesting systems for broadacre systems,
- Developing animal performance and welfare standards
- Improving post farm energy usage efficiency
- Farm work place management skills
- On–farm Nutrient management
- Change management within complex farm systems, and
- Climate change impacts on regional production systems
- Vocational Education and training
- International food standards and life cycle reporting systems

[9] The Dairy Moving Forward pre-farmgate R&D priority setting initiative for example includes 160 industry, government and research partners including all major dairy companies

**The Australian Government** has acknowledged the relevance of these skills in recent years by **delegating DA to devise and deliver several major government funded research and extension initiatives around NRM and climate issues** such as:

- Dairying for Today, Planning for Tomorrow Phase I and II (2008 and2009),
- Dairy Live – interactive response to global financial crisis (2009)
- Feed, Fibre, Future partnership with ADIC and Cattle Council (2006/07)
- Regional NRM coordinator programs. (2008/09)

***Working Collaboratively to Maintain Effective R&D Capability***

While DA has a central role in the provision of dairy-based RD&E, the contemporary dairy research, development and extension framework comprises a range of bodies including federal and state government agencies, universities, industry organizations, RDCs, CRCs and private firms. This framework is highlighted in Table 1 which summarizes the dairy-related RD&E investments made by different members of this framework in 2007.

Each body involved in dairy R&D brings a particular mix of research skills and capabilities. They also operate against a range of legitimately different perspectives and desired outcomes. One of the challenges identified in the national Primary Industries Research and Development Framework is the need to take a holistic approach to research capability to ensure there is better integration of research development and skills with the challenges identified by industry players.

Within this framework **DA uses its strong linkages to industry, its technical expertise and its independence from individual research providers** to help identify emerging or potential capability gaps and to develop collaborative approaches to addressing these gaps. Some examples of the type of investment generated under this collaborative approach include:

- The Dairy Extension Centre (DEC) joint partnership with the Department of Primary Industries Victoria (DPIV).
- Recurrent funding of Future Farming Systems with DPIV.
- DA's major investment in Dairy Innovation Australia Limited (DIAL) a joint venture initiative in pre-competitive post farmgate research with major Australian dairy manufacturers
- DA's role as an investment partner in the Dairy Futures CRC – a large scale industry-government partnership exploring higher-risk opportunities in animal and plant genetics with an emphasis on paths to market
- A funding agreement with the Tasmanian Institute of Agricultural Research to sustain pasture research capabilities
- The Rural Innovation Research Group (RIRG) - a joint investment with the University of Melbourne that retains a capacity to improve the quality of industry development, evaluation and delivery of research in key areas such as feed base development, genetics and change management, and
- DA's ongoing investment in post-graduate scholarships.

**Table 1: Estimated Expenditure on DAIRY RD&E Services in Australia 2007 by Funding Body**

| | FUNCTIONAL AREA | | | | | | |
|---|---|---|---|---|---|---|---|
| **FUNDERS** | **Dairy Farm** | **Production** | **Dairy** | **Manufacturing** | **Economics** | **& Marketing** | **TOTAL** |
| | **R&D** | **Extension** | **R&D** | **Extension** | **R&D** | **Extension** | |
| | **$'000** | **$'000** | **$'000** | **$'000** | **$'000** | **$'000** | $'000 |
| | | | | | | | |
| Dairy Australia | 9,228 | 13,983 | 9,182 | 2,427 | 565 | 794 | 36,179 |
| Gardiner Foundation | 2,140 | 845 | 3,108 | 360 | 0 | 0 | 6,453 |
| Commonwealth Depts/ Agencies (non CSIRO) | 9,768 | 3,195 | 1,390 | 0 | 62 | 0 | 14,415 |
| Consultants | 0 | 5 | 17 | 0 | 0 | 0 | 22 |
| CRCs | 1,253 | 0 | 0 | 0 | 0 | 0 | 1,253 |
| CSIRO/FSA | 3,899 | 210 | 2,603 | 0 | 0 | 0 | 6,712 |
| Dairy Companies | 602 | 7,167 | 22,827 | 6,200 | 530 | 0 | 37,326 |
| Supplier Companies | 2,163 | 1,330 | 1,410 | 0 | 0 | 0 | 4,903 |
| Industry Organizations | 378 | 221 | 749 | 0 | 0 | | 1,346 |
| NCDEA | 0 | 3,237 | 0 | 944 | 0 | 0 | 4,181 |
| Overseas Organizations | 1,063 | 0 | 25 | 0 | 0 | 0 | 1,088 |
| Regional Development Programs | | 30 | 0 | 30 | 0 | 0 | 60 |
| Research Centres | | | 0 | 0 | 145 | 0 | 145 |
| RDCs (non-DA) | 650 | 56 | 0 | 0 | | | 706 |
| State CMAs/Water agencies | 904 | 1,286 | 0 | 0 | | | 2,190 |
| State Safe Food Agencies | | | | 8 | 0 | 0 | 8 |
| Dept Primary Industries (Vic) | 7,180 | 2,542 | 607 | 0 | | | 10,393 |
| Other State Govt Depts | 6,292 | 7,186 | 70 | 14 | | | 13,562 |
| Universities | 4,451 | 1,663 | 5,640 | 0 | 0 | 298 | 12,052 |
| Veterinarians | 5 | 192 | 0 | 0 | 0 | 0 | 197 |
| Other | 0 | 1,792 | 0 | 0 | 0 | 0 | 1,792 |
| Total | **49,976** | **44,940** | **47,773** | **9,953** | **1,157** | **1,156** | **154,955** |

***Source: Juff and Oates 2007***

**Collaborative investments such as the DEC, DIAL and RIRG are important in ensuring that:**

- Australian dairy retains a critical mass of technical expertise that is attuned to dealing with identified specific challenges facing Australian dairy producers

- Key areas of pre-competitive research are undertaken and delivered on a very cost effective basis..

Similarly, DA's investment in the CRC partnership is helping to build a platform that allows effective large scale investment in one specific (potentially high return) driver of industry competitiveness (i.e. genetic capability) while maintaining DA's capacity and flexibility to address other industry challenges.

The above initiatives assist in maintaining the strength and viability of the national Primary Industries R&D Framework. In this sense, they are examples of how DA continues to implement a core objective set out for RDCs under the 1989 PIERD Act, namely to make more effective use of community resources and skills and, particularly, those of the local scientific community to the benefit of members of the dairy industry.

***Investing globally to achieve the best local returns***

While maintaining an effective domestic R&D infrastructure is important, DA also recognises that Australian dairy's small share of world production, makes it impractical to expect that all the knowledge relevant to the industry's future growth and profits will (or should) be generated domestically. Therefore, **DA regularly pursues international research partnerships as a way of delivering more cost effective outcomes and returns** for Australian dairy producers. In recent years DA has signed memorandums of understanding with three overseas groups (See Box E) to deliver cost effective innovation to Australian dairy. In pursuing these partnerships, DA is also mindful of the opportunity they can present to significantly accelerate or expand the successful adaptation and adoption of beneficial technologies by local farms.

***Evaluating Program Outcomes***

Given its funding base and charter DA is concerned to ensure that its investments in RD&E and other industry services deliver clear and measurable benefits to levy paying farmers

**DA undertakes formal assessments of all planned RD&E and service activities to** establish clear estimates of the expected Return on Investment (both benefit cost ratios and Internal Rates of Return). Given the broad nature of DA's service activities some programs can only be assessed against more qualitative performance targets.

This work is conducted by independent external assessors and through reference to industry stakeholders (the Australian Dairy Farmers Ltd and the Australian Dairy Products Federation). The expected returns must be much higher than the planned cost of capital investment and provide clear and agreed pathways for benefits to flow back to levy paying farmers. The estimated average benefit cost ratio of DA's investment on the

dairy industry's behalf in 2009/10 is 3.0 to 1 (with farm productivity RD&E programs delivering a slightly higher benefit cost ratio of 3.7 to 1.[10])

Allocating DA's limited resources then becomes an exercise in assessing how to maximize overall value based on the guiding principles set out above and DA's industry-agreed strategic priorities.

DA periodically reviews the performance of programs and projects in delivering their expected value (and seeks external confirmation of this value by industry participants).

In conjunction with other RDCs DA has also worked with the Council of Chairs of RDCs to develop an agreed framework and methodology to evaluate and report on program performance. This framework allows for the robust demonstration to stakeholders of the value delivered to them by DA's R&D investments.

**Box E: International Partnerships for Profit**

Recent DA international partnerships include:

Agreement with **Dairy Management Incorporated** an industry based US research body to secure access to R&D research into health aspects of dairy fats in different diets.

M.o.U. with **Dairy New Zealand** – a counterpart body to DA – that covers both joint funding of specific research projects, and the sharing of non-competitive research findings from individually funded research that is relevant to farm production systems in both countries. This sharing arrangement helps to minimise duplication in base level research to the benefit of producers in both countries.

M.o.U. with the **NIZO Research Group** – a private dairy manufacturing research group from the Netherlands. This collaborative arrangement benefits the Australian dairy industry by reducing duplication in base research, creating synergies in investment and improving the effectiveness of post farmgate RD&E. This agreement also contains provisions for the cost effective sharing of knowledge on best practice and the transfer of knowledge and capability to develop the Australian dairy industry. It allows DA to use NIZO's skills to improve commercialization of research collaborations with the Australian dairy industry.

**Future Dairy partnership** with Alfa Laval/ University of Sydney. Automated milking systems have been privately developed and commercialized in the Northern Hemisphere for some years. However the technology is geared to the intensive, small scale farm systems prevalent in those regions. Given the significant potential impact that such technology could have on Australian farm lifestyles and operating systems DA has jointly funded this research to successfully identify how such technology can be modified to work within Australian broad acre farm systems. [11]

[10] DA assesses the measured benefit cost ratio of some non-R&D activities such as information gathering and analysis have as being closer to 2 to 1 over the medium term.

[11] While the knowledge and technology covered by this partnership may ultimately have been developed and delivered privately in Australia DA strongly believes that its involvement will significantly accelerate the implementation (and increase the uptake) of this beneficial technology.

**DA recognizes that many of its investments generate benefits to both dairy industry participants and to the broader community**. Often these benefits are intrinsically linked. This is particularly so in the case of RD&E relating to health and nutrition, natural resource management and education. All investments, therefore, are reviewed from a triple bottom line context to enable industry to understand the likely level of community spillovers from DA investments.

Box F provides examples where the community spillover benefits from dairy RD&E is significant relative to direct industry gains. This is an important point in relation to considerations of funding rationales for rural RD&E (discussed in section 3).

**Box F: Independent Estimates of Benefit Flows from Specific DA Investments**

***NCDEA*** The National Centre for Dairy Education Australia (NCDEA) is a partnership between Dairy Australia and the Goulburn Ovens Institute of TAFE and 10 other alliance partners consisting of regional TAFEs from across Australia. The partnership was formed in 2005 to develop and deliver Vocational Education and Training courses and competencies for the benefit of the Australian dairy industry and the wider community.

**Health & Nutrition** A long term program focusing on developing sound scientific evidence on the health and nutrition benefits of dairy products in the human diet

**Dairy Landscapes** Part of a broader Dairying for Tomorrow program – this worked to raise farmer awareness of environmental management systems, develop on-farm evaluation tools and assist the design and implementation of on-farm action plans

**FINANCIAL SUSTAINABILITY MEASURES RETURNS TO DAIRY FARMERS AND AUSTRALIA**

| | NCDEA | | Health & Nutrition | | Dairy Landscapes | |
|---|---|---|---|---|---|---|
| | **Farmers** | **Australia** | **Farmers** | **Australia** | **Farmers** | **Australia** |
| | | | | | | |
| PVB | $15.5 M | $27.4 M | $14.0 M | $9.5 M | $14.2 M | $15.8 M |
| PVC | $1.2 M | $1.2 M | $6.1 M | $0.7 M | $0.8 M | $0.8 M |
| NPV | $14.3 M | $26.2 M | $7.9 M | $8.8 M | $13.4 M | $ 15.0 M |
| | | | | | | |
| BCR | 13 | 23 | 2 | 14 | 18 | 20 |

In the above analysis
Returns to dairy farmers are based on measured economic benefits accruing to them from the program and the cost they incur through payment of the Dairy Services Levy

Returns to Australia are based on economic, social and environmental benefits captured by the broader community (excluding dairy farmers) and the cost to government of the provision of matching funds.

Note: Not all benefits have been included in these estimates of financial sustainability.

***Source: BDA Consulting (2008 and 2009)***

## 2.5 Strengths of the Current Dairy RDC Model

**The current dairy RDC model is fundamentally sound and has demonstrated an ability to deliver benefits both to industry and the broader community.**

The last decade has seen massive change and restructuring in many areas of agriculture. Farm systems have had to become more adaptable and resilient in order to continue (e.g. dairy farming in the Lower Murray Darling Basin is considerably different in approach from a decade ago, with farms having to shift between different farm systems within seasons). This efficiency and resilience has come at cost – in terms of more complex farm systems and a greater demand on farm business management skills and capability. Community needs and expectations of food producers are also changing.

This more volatile environment requires RD&E providers to be able to evolve their structures and programs in order to remain relevant and effective.

From a dairy perspective there is strong evidence that DA's integrated structure has provided the flexibility to adjust service roles to meet shifts in the dairy industry's operating environment. Recent examples of this flexibility include:

- The development of regular Dairy Situation and Outlook reports post 2004
- The Grains2 Milk initiative that is helping farmers better manage feed decisions in a more variable feed and water supply environment
- The Confidence to Grow initiative of 2009 that has helped prepare farms and factories for the biophysical impacts of climate change and the impacts of associated policy and market adjustments.

DA's whole of system perspective gives it the ability to collaborate with a range of partners, including other RDCs, to develop and adapt customised innovation systems that meet specific industry requirements, for example:

- The DGAS greenhouse gas calculator for dairy farms
- The National Centre for Dairy Education partnership to drive on-farm and post farm vocational education and capability development.

DA's whole of chain approach ensures that it undertakes a broad research agenda covering not only farm productivity, but also processing efficiency, market access; natural resource management; animal health and welfare; human nutrition; product development; food safety; quality systems; advanced technologies etc.

DA's ongoing engagement and interaction with industry also helps ensure that:

- Research is driven by a clear understanding of industry stakeholder needs and business environments
- There is close alignment of R&D and service activities with industry needs and a strong sense of industry ownership of research aims and outputs, and
- There are effective mechanisms to facilitate the adoption and take up of knowledge gained through appropriate R&D.

**These industry linkages are critical to maintaining the continued relevance of RD&E project outcomes and it profitable take up by farm businesses.**

At the same time, DA's independent skills-based Board structure allows for strong governance principles to be applied, and for non-industry perspectives to be included in assessments of the likely value of specific programs from both an industry and broader community perspective.

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DA's development and delivery of RD&E within a framework of complementary service roles helps ensure that research funding:

- Centres on areas that will generate significant benefits to producers,
- Can adjust flexibly to changing circumstances
- Allows the flow through of benefits to consumers and the Australian community

**This matrix approach and funding flexibility is a key strength of the DA model.**

DA's capacity to act as an informed technical investor in R&D is important in promoting understanding of key dairy drivers among government, other industries and Australian and international research providers. This facilitates multiple types of collaboration between dairy and other members of the rural R&D system such as the Dairy Extension Centre partnership with DPIV, the NCDEA, and the Cooperative Research Centre.

The national Primary Industries Research and Development Framework set up by PIMC and the National Rural and Research Priorities have important roles to play in Australia's overall rural innovation system. They facilitate effective and sustainable change across agriculture by:

- Providing clear direction on broader social challenges and expectations
- Identifying pathways for effective information sharing
- Clarifying the respective, complementary roles of different research partners and
- Securing better alignment and synergies between industry-based and cross-sectoral R&D initiatives

This system approach is crucial to effective innovation in Australia. In complex supply chains individual bodies cannot deliver effective innovation in isolation. The RDCs are uniquely positioned to facilitate and integrate the innovation process within their specific industries and, in doing so, help drive the broader innovation agenda of government.

Their industry linkages are pivotal to securing industry engagement in rural innovation which leads to more relevant R&D outcomes and greater benefits for both agricultural producers and the broader Australian community.

# 3 Rationale for Continued Public Funding of Rural RD&E

In addition to assessing the soundness of the current RDC model the Commission has been asked to consider the appropriateness of current funding levels and arrangements for agricultural R&D with particular reference to levy arrangements and Australian government matching fund co-contributions.

DA is aware of, and supports, the comments presented by the Council of Rural Research and Development Corporations (CRRDC) in relation to these questions. The following sections incorporate additional responses to specific issues and questions raised in the inquiry Discussion Paper.

## 3.1 Should government provide funding support for rural R&D?

As noted before, open export-oriented sectors like Australian food production are heavily exposed to world market movements and changes in consumer attitudes. They must be able to innovate and adapt to changing market circumstances if they are to remain competitive and resilient.

Innovation is an important, driver of economic growth. RD&E is an important component of innovation.

The Australian community benefits from government sponsored RD&E both through access to the resultant innovations, and through the higher living standards that economic growth brings. The Commission acknowledged this in its 2007 report on *Public Support for Science and Innovation* where it commented that there were widespread and important economic and social and environmental benefits generated by the public funding support of science and innovation.

Independent studies (e.g. Pardey and Alston 2010, Mullen 2007) have identified that significant returns have accrued from past investments in rural RD&E in Australia. Some of the benefits from rural RD&E have spilled over to the broader community. Examples of these benefits include a safe and stable food supply, improved human health and nutrition, an enhanced national knowledge and skills base and improved environmental conditions arising from sustainable on-farm management practices. This suggests that rural RD&E has generated significant benefit to the broader Australian community in similar fashion to R&D in other sectors.

The Commission seems to support this view in its 2009 review of Drought Policy where it recommended that significant public funding be provided for agricultural research, development and extension reflecting the sound rationale for governments to assist farmers to build their capacity through funding for research, development and extension.

In introducing the PIERD Act in 1989 the government indicated that its continuing support for, and involvement in, the joint funding of rural R&D was linked to the existence of ongoing market failures, the external benefits flowing to society from research and the positive support that the government received from the research capacity of RDCs in terms of its (the government) role in natural resource management. These justifications apply equally in 2010.

## 3.2 Market Failure and Agricultural R&D

In relation to the funding rationale for rural RD&E the Commission has indicated that it wishes to explore:

- If market failures remain more likely in agriculture than in other sectors of the economy and
- Is the "free rider problem" in agricultural R&D addressed by the industry levy system?

Market failures are industry characteristics that, in the absence of government support, would lead to underinvestment in R&D or other service activities from a community perspective.

While industries like dairy have evolved considerably since the passage of the PIERD Act the characteristics of farm production and the rural environment that encouraged market failure back in 1989 remain in place today.

One of these is the scale of agricultural businesses. Agricultural production in Australia is delivered by about 140,000 small businesses. In the case of dairy the industry's farm base consists of around 8,000 individual businesses. The scale of operation can vary between individual farms but most dairy farms remain small or medium sized enterprises. From a production perspective industry concentration levels in dairy are extremely low. The largest individual farms would represent less than 0.2% of national production.

Rural production relies essentially on harvesting the results of self sustaining, biological, processes which are common across many farms. Productivity gains from R&D generally arise from the development of information and techniques to improve the management of these processes.

This information can be readily transferred between individuals. Its use by one individual does not diminish its value to another producer. As a result, access to the outcomes of much R&D is not easily restricted. This makes it difficult for the owners of research to appropriate the full return e.g. all dairy farmers can benefit from pasture improvement R&D activities, but so can farm producers in other sectors and vice versa.

The non-excludability and non-exhaustion attributes of much rural R&D make it more difficult to secure intellectual property protection over such work compared to most R&D on non-rural products.

Agricultural production also takes place in a continuously variable, seasonally bound, natural environment, compared to the stable, controlled, environment and short production cycle of most non-farm products. This limits the geographic scope to which some rural R&D applies. It also requires that the evaluation of R&D results be conducted over several seasonal production cycles to ensure reliable results. This substantially increases the cost of rural R&D relative to much non-farm research. It also means the lag time for securing these benefits may be significantly longer in agriculture than for other sectors.

These long lag times (20 years or more on average) can create issues between who pays for and who ultimately benefits from investment in specific rural RD&E (although both groups are likely to be farm producers).

Small or negative economies of scale in rural production also limit the output of individual firms to a small share of total supply. Farm outputs often have to be combined with the output of other farms early in the supply chain in order to make up marketable parcels.

Given these factors, in the absence of government intervention, market failure will remain prevalent in Australian agricultural RD&E. Potential market failures include:

- Most farm businesses will lack the scale to undertake effective RD&E
- Farm businesses that did undertake RD&E would be unable to capture the full benefits of their research
- Incentives exist for some farms to 'free ride" research or information gathering (i.e. use a publicly available resource without paying for it)
- The length of time for R&D benefits to accrue to farms would see farmers excessively discount the value of R&D investment, making it difficult to arrange voluntary structures to fund and undertake mutually beneficial RD&E
- Vulnerability to climate cycle will also discourage sustained private investment to maintain R&D infrastructure.

It is clearly undesirable to restrict communication of the findings of rural RD&E to the levy payers who partially fund the research. **Research discoveries must be applied, or there would be no benefits from the research**. The fragmented nature of rural production (many small farms) also means that the broader the adoption of R&D findings the greater the likely benefit that will flow through both to industry and the broader economy.

Therefore, as part of its charter, DA provides the results of its R&D to levy paying farmers through a wide range of channels. These include:

- Regional Development Programs
- Involvement in company-based information networks
- Demonstration farm processes
- On-farm seminars and active extension sessions
- Formal educational training arrangements (NCDEA)
- Publicly available websites (*In Calf, People in Dairy, Future Dairy*)
- Targeted information brochures (*Cool Cows, Regional Climate bulletins*)

One consequence of this wide communication of RD&E findings to levy payers is that it becomes less feasible to withhold access from non-levy payers (farmers in other sectors, foreign farm businesses). Since the findings of dairy research can generally become freely available to farm businesses outside dairy there are likely to be spillovers to other agricultural activities. For example, pasture research conducted by DA may also provide benefits to beef and sheep graziers.

As a result, **significant elements of the knowledge generated by DA and other RDCs have 'public good' characteristics (i.e. they are non-rival and non-excludable in consumption).**

It is neither desirable nor feasible to ration the use of a 'pure public good' (Stiglitz 1998). Since, rural RD&E has many of the characteristics of a 'pure public good' there is an ongoing risk that farm businesses will undertake less rural RD&E than is socially desirable in the absence of government funding support.

Also as RDCs generate a portfolio of RD&E that delivers both public and private benefits it is appropriate that this continues to be funded under a joint government/industry model.

This is in line with the international approach to rural RD&E which is substantially funded by government in most countries (Alston et al, 2010, pp144).

### 3.3 Levies and Market Failure

The imposition of industry levy arrangements has long been recognised as an important tool to reduce the risk and incidence of certain market failures associated with RD&E, particularly the risk of free riders.

There would seem to be no question that the implementation of levy funding arrangements diminishes the risk of free riders (since all producers pay according to a fixed formula).

**Whether imposing levies on farm producers is sufficient to address all the market failure elements affecting investment decisions in rural R&D is less clear.**

Establishing the exact level of levy that will fully remove the risk of market failures in complex, dynamic systems like agriculture is an extremely difficult task. This difficulty is compounded by information asymmetries and the difficulty of determining the exact split of private and public benefits arising from specific types of RD&E.

A recent paper by Mullen commented that even in the case of pure "industry benefit" research there is no practical levy mechanism that will not result in under-investment without some public contribution. Therefore, it cannot be assumed that establishing a levy framework will, of itself, automatically remove all market failure risks in regard to R&D.

In the past the Australian government has recognised this, making public contributions (through mechanisms like matching funds) to encourage an increased level of industry investment via levies in order to reduce the risk, and incidence, of ongoing market failure.

**The recent evolution of levy arrangements across Australian agriculture (with periodic voluntary farm votes) reinforces the necessary ongoing role of matching funds in addressing potential market failure.**

Under the current dairy industry arrangements, farmers are periodically entitled to individually and voluntarily vote on the rate of Dairy Services Levy that they wish to pay on production.

Since the conditions that give rise to market failure (information asymmetries, difficulty of capturing all benefits, long lead times to implementation) are still present under the levy system, there is the same incentive for famers to vote for a levy rate that would lead to sub-optimal investment levels (i.e. the same outcome as would occur in the absence of a levy system).

Under current arrangements, **the risk that farmers will vote for a level of levy that is suboptimal from an economic perspective would increase** if the government sought to adjust the basis of co-contributions from the current matching fund structure to one where co-contributions favoured R&D activities that have an estimated higher incidence of social spillovers (or reduced benefits for levy payers).

This risk reflects the nature of matching fund payments. Matching payments are not straight grants. Rather the government matches each dollar spent from farmer levies on relevant RD&E.

If the government were to amend its co-contribution so that these favour activities that focus on delivering benefits outside industry this could reduce farmers' perception of the potential gains from levy-funded R&D, the degree of industry control and, ultimately, the "value" of continued participation in an industry levy scheme. This would, in turn, put pressure on the rate of levy that farmers are willing to contribute or even whether they support a levy-based system.

This discussion highlights several important points:

- The research undertaken by RDCs has significant public good characteristics
- Current Australian government co-contributions are vital in addressing the risk of ongoing market failure in relation to rural RD&E, and
- Any changes to the basis of government co-contributions must be made with a very clear understanding that they could exacerbate rather than reduce the risk of market failure.

These points have implications for certain questions raised in the Discussion paper.

### 3.4 Is the case for government funding support for rural R&D stronger than in other parts of the economy and, if so, why?

Australian governments provide significant support for R&D, including funding for universities, CSIRO and CRCs. This is in line with the accepted position that such investment yields significant economic, social and environmental benefits for Australia overall.

All Australian businesses that undertake research (including RDCs) are likely to benefit from the infrastructure and research provided by universities, CSIRO and CRCs. It is not clear that RDCs gain a greater advantage relative to other sectors from this publicly funded capability. Obvious examples where government funding favors agriculture such as the work of the federal Department of Agriculture, Fisheries and Forestry or state Departments of Primary Industry, are counterbalanced by other departmental services that favor other sectors.

Recent shifts in the operating models of universities and the CSIRO to more commercial, full cost recovery service models make it more difficult to assess the level of any subsidy on offer to users of these services. In the case of RDCs the level of any subsidy must be partly offset by the beneficial impact of their investments to maintain and support the specific science infrastructure.

The current matching payments support for RDCs is one of a number of programs which the Australian government uses to encourage private innovation and research.

The Government has operated tax-based incentive systems for a number of years (e.g.125% and 175% concessions). It is introducing a new general tax incentive for R&D with effect from 1 July 2010. In general, farm businesses will be excluded from the proposed new R&D tax provisions.[i12] Under the new incentives:

- *A 45 per cent refundable tax offset is available to R&D entities with an aggregated turnover of less than $20 million (unless they are a tax exempt entity or majority owned or controlled by tax exempt entities).*
- *A 40 per cent non-refundable tax offset is available for all other R&D entities. R&D entities accessing the non-refundable tax offset can carry forward any unused offset amounts, under the tax offset carry forward rules* (Australia 2010).

Most Australian farm businesses have turnovers of less than $20 million. This suggests that the current 50% matching fund contribution on RDC investment in R&D is consistent and comparable with the R&D support on offer to small business in other sectors (45%)[13]. This comparability also reflects that:

[12] Eligibility for the new R&D tax provisions is restricted to:
- *corporations that are Australian residents for tax purposes;*
- *foreign corporations that carry on R&D activities through a permanent establishment in Australia; and*
- *public trading trusts with a corporate trustee* (Australia 2010).

Most Australian farm businesses will be ineligible for the new tax provisions because they are unincorporated. Over 92% of dairy farm business structures are partnerships, sole traders and discretionary trusts. The new tax provisions also impose an annual minimum threshold of $20,000 of eligible R&D expenditure. Again, most farm businesses would not qualify as they are unlikely to spend $20,000 per annum on R&D activities.

[13] Under the previous R&D tax concessions for industry, the government contribution (by way of tax foregone) would appear to have ranged 37-52c per dollar invested in R&D (assuming a company tax rate of 30%).

- Non-agricultural firms appear to have a greater chance of capturing the benefits of R&D through the creation of intellectual property rights (IPR).

- Non-agriculture R&D concessions do not appear to have significant social spillover obligations attached to them while the RD&E expenditure of RDCs must comply with the broad R&D principles set down by government.

For example, the Explanatory Memorandum to the draft legislation for the new R&D tax provisions contains numerous examples of eligible activities. Many of the examples described would result in significant private benefits if the research was successful. The R&D undertaken by such firms is also likely to be supported by the research conducted by CRCs and universities, similar to rural R&D.

Unlike most rural RD&E, the research discoveries of most other Australian businesses are likely to be a private good. These businesses may choose to keep their discoveries as 'trade secrets", or they may choose to create an intellectual property right (IPR) over their discoveries. In either case, they can choose to exclude their competitors from using their discovery and receive a commercial advantage. If they create an IPR, they may choose to receive a stream of income by licensing the use of their discovery or a capital sum by selling the IPR.

While the RD&E discoveries of non-rural Australian businesses are likely to give them a competitive advantage over rivals, as noted above, individual farm businesses are not likely to derive the same competitive advantage from rural RD&E This is because the knowledge is generally made available to all Australian farmers (and can be accessed by other producers). This suggests there is a significant commercial difference between successful RD&E undertaken by rural businesses via RDCs and that undertaken by most other Australian business.

**The significant public good nature of research undertaken by rural RDCs would seem to support a larger public contribution for rural R&D** compared to that provided for largely private good research undertaken by other Australian businesses.

### *Is there specific evidence that projects funded by RDCs produce significant wider benefits for the community relative to those enjoyed by industry?*

While the evidence of past R&D is not automatically a good guide to expected future returns independent reviews of DA R&D projects have identified numerous examples of industry funded RD&E that has generated significant social and environmental spillovers. Some examples of this were shown in Box F. Other environmental and social spillovers that have arisen (and will continue to apply) from the implementation of dairy R&D include:

- Increased water use efficiency (through improved irrigation techniques)
- Increased water quality (arising from the NRM practices on a wide range of dairy farms relating to nutrient runoff, effluent management, riparian strips and fencing off of waterways)
- Reductions in greenhouse gas emissions from research on fertiliser application and reduction of methane production

- Reduced soil salinity through modified farm systems
- Improved food safety
- Strengthened regional communities and economies through the maintenance of productive farm and factory systems
- Reduced health care costs (from improved balanced diets)
- Increased workforce skills (through industry based training)
- Improved animal welfare (through modified farm practices)
- Increased consumer welfare (through the adoption of R&D outcomes).

More detailed examples of social spillovers arising from dairy industry initiatives are set out in Appendix 2.

The nature of many R&D activities means that it can be very difficult to separate the spillover gains arising from specific programs relative to those accruing to the dairy industry itself. Some social benefits (like improved food safety) are difficult to measure precisely.

Even with these limitations, the environmental and social spillovers of rural research are impressive. In the case of dairy, they are likely to remain so given the emphasis in DA's strategic priorities on health and nutrition, climate change, natural resource management, developing people skills and reinforcing the integrity of the dairy system.

DA acknowledges that further work can be done on seeking to develop more robust and broadly accepted means of assessing the social and environmental gains from rural RD&E. To this end it is committed to collaborating with other RDCs and the CRDCC on developing this agenda.

When considering the level of spillovers from the previous work of RDCs it is important to note that this work was conducted under the objects of the Primary Industry and Energy Research and Development Act which include:

> *To increase the economic, environmental and social benefits to members of primary industries and to the community in general by improving the production, processing, storage, transport or marketing of the products of primary industries;*

The PIERD Act and DA's own objectives (set out on Page 7) reinforce the intended industry focus of its work. Given this charter it would be surprising if, in aggregate, the broader spillover benefits to the community from DA's work outweighed the defined industry benefits.

### 3.5 Practical constraints on basing government funding support for rural R&D around notions of private/industry benefits versus wider benefits?

Public economics is built on the concepts of public and private goods. In general, the theory of public economics supports the concepts of governments providing public goods, the private sector providing private goods, and both sectors contributing to the provisions of mixed public/private goods. Public economics does not appear to have significant theory on the concepts of public and private benefits.

The standard economic text *Public Finance in Theory and Practice* (Musgrave and Musgrave 1989) devotes little discussion to the benefit principle. However, they note:

> *"Under what conditions is this technique feasible and desirable? The case for finance by direct charges to the user is clear cut where the goods and services provided by the government are in the nature of private goods, i.e., where consumption is wholly rival".* (Musgrave and Musgrave 1989, p. 221).

Nobel Laureate Joseph Stiglitz 1998 pp. 403-4) similarly argues:

> *"Economists have not, for the most part, been attracted to the benefit approach to taxation, largely because it is impossible to identify the magnitude of benefits received by different individuals …"*

Stiglitz also notes there are often equity-efficiency trade-offs involved with levying benefit taxes (in those cases where it is possible to do so). This suggests that there appears to be little economic theory supporting the application of the benefit principle to public goods, such as the discoveries resulting from rural RD&E.

There is also an efficiency issue associated with benefit taxation. It is well known that there are significant deadweight losses associated with most taxes. Benefit taxes will also have deadweight losses. It is an empirical question whether benefit taxes will have larger or smaller deadweight losses than other forms or taxation. In principle, taxes imposed on narrow bases are likely to be more inefficient than taxes imposed on wider bases. **Economic efficiency will be maximized if public goods, such as rural RD&E, are financed by those taxes with the least deadweight losses.** This suggests that the Commission would need to estimate the relative magnitudes of deadweight losses associated with alternative sources of government funding for rural RD&E if it is to consider such changes.

***Could naïve application of such an approach have unintended consequences?***

The application of the industry or wider benefits as a determinant of funding is straightforward in the polar cases. Government should fund basic research. The private sector should fund research where the benefits are exclusively private. What is problematic is the application of the principle to RD&E that provides mixed benefits.

In practice, most of the research conducted by RDCs will have spillover benefits (as indicated in earlier examples). This suggests that a joint funding model for rural RD&E remains appropriate.

It is difficult to comment on the possible unintended consequences of the application of the industry or wider benefit model without knowing what alternative arrangements might apply. However, it will be important, going forward, to ensure that RD&E with **both** industry and wider benefits can continue to be undertaken.

***What factors might mute the strength and/or timing of any increase in private funding in response to withdrawal of public funding for industry-focused R&D?***

The industry response to a reduction in public funding is likely to depend on the nature and communication of any alternative policies or structures introduced to 'replace' the funding, and potential transition arrangements.

It is also likely to depend on relative commodity prices and climatic conditions at the time of transition. It is possible to envisage circumstances where such a change may lead to a reduction in private funding rather than an increase. For example, farm businesses may respond negatively if the Australian government contribution to RDCs was removed or re-directed as a cost-cutting measure without the provision of alternative arrangements. This could reduce support for levy funded R&D activities.

***Divergences between points of funding and benefits***

It is well known that the economic incidence of the tax is not changed by where it is levied along the supply chain. Consumers and producers will share the tax burden depending on the relative elasticities of supply and demand. In the case of goods where demand is very elastic, the producer will bear the entire tax burden (such as exported rural produce in some world markets).

In the absence of market imperfections, the various businesses along a supply chain will share in any changes in revenues. From a theoretical perspective, divergences between where research is funded and where benefits are derived should not matter. However, the R&D levy is a hypothecated tax — the funds raised are remitted to the RDCs. The levy is collected from the receipts of farm businesses, and they can observe the purposes for which it is spent. If farm businesses collectively perceive they receive more benefits from RD&E directed closer to the farm gate than that directed further along their supply chain, they may respond to a reduction in public funding by requiring RDCs to focus more strongly on farm-orientated research.

***Other factors which may reduce private funding of rural RD&E***

There are at least two further factors which may restrict private funding of rural RD&E.

The first is the combination of the long lags in receiving the benefits of RD&E, and the age of farmers. The median age of farmers in 2006 was 52, while 18 per cent of farmers were over 65 (ABS 2006). As farmers age and contemplate retirement they are likely to discount the future benefits on offer from long term RD&E and, consequently, invest less.

A second factor is that many farm businesses have low and highly variable net incomes. Private RD&E expenditures are likely to be influenced by net incomes. Farm businesses with negative or low net incomes are likely to focus spending on 'essentials' which will generate more immediate returns, rather than RD&E. This hypothesis is supported by the OECD which reports:

> *Research and Development (R&D) expenditures are among the first to be cut during recessions* (OECD 2009).

# 4. Some Future Challenges for RDCs

While the current industry-based RDC model remains sound, it cannot remain static. To effectively serve industry and the broader community, RDCs must continue to evolve and adjust to changing circumstances.

## 4.1 A Collaborative Approach to Emerging Challenges

Australia's current rural RD&E capacity has been stretched by funding pressures and competition from other sectors for research infrastructure.

The evolving roles of general research agencies (such as the CSIRO) and universities - who are being asked to take more commercial approaches to funding core research and education – is also creating questions about roles, directions and IP ownership..

The emergence of new multi-faceted debates around climate change, sustainability, health, and food security and production ethics has also required RDCs to invest in new areas beyond traditional productivity RD&E.

The debates associated with these broad-based challenges extend beyond the traditional boundaries of agriculture into broader areas of social debate. They are putting pressure on food production and agriculture's continued right to Australian natural resources (and the cost of this access). For example, developing understanding of the trade-offs between providing greater food security and meeting other social expectations around water use, carbon or the ethics of food production is quite complex. It requires **agricultural groups to identify and understand how farm and food manufacturing systems interact with a much broader range of social, economic and policy drivers than ever before.** It will also require agricultural industries to develop and communicate new messages to new audiences.

The separation of responsibility in dealing with these new challenges across a range of government departments beyond DAFF adds to the complexity of this task.

Even within agriculture the immediate path forward is not always clear. For example, recent discussions on cross-sectoral strategies under the national Primary Industries RD&E Framework has raised questions about how centralized (cross-sectoral) efforts undertaken within the Framework should intersect with industry-specific responses.

These factors all add to the complexity of decision making at a farm, company and industry level. They highlight the need to maximize the ongoing efficiency of existing industry service structures and investments. This suggests that it will be important for RDCs and others in the rural innovation system to:

- **Develop more effective cross-sectoral coordination and collaboration mechanisms around RD&E**
- Undertake **regular, open assessments of Australia's existing RD&E capabilities** and how well these match different stakeholder challenges, and
- **Build new understandings and connections between agriculture and broader government groups.**

RDCs have a strong track record of collaboration, both in regard to RD&E and other industry service roles (like trade policy). The Council of Rural Research and Development Corporations (CRRDC) has been, and can continue to be, an important facilitator of these efforts particularly in relation to R&D strategy development, project evaluation and reporting and information sharing.

Effective sharing of information on industry-level issues and responses not only reduces the risk of duplicated effort, but also assists understanding of how specific challenges (within and outside agriculture) can drive future returns and opportunities.

Despite past successes, there would appear to be considerable value for both the RDCs and government in working to build on existing frameworks for collaboration such as the national Primary Industries Research and Development Framework to develop a common, agreed approach to the high level coordination and monitoring of progress in implementing rural RD&E. All RDCs and the CRRDC are currently partners within the Framework.

More effective coordination and collaboration in this area is likely to help:

- Identify common challenges and areas of potential co-investment
- Clarify the inter-face between national and industry specific challenges
- Build awareness of current industry-level interaction with overseas counterparts on issues that are relevant to Australian policy debates
- Significantly improve integration of the rural innovation system (including RDCs) with the broader national innovation system, and
- Allow agriculture, as a sector, to engage more broadly with policy and community groups interested in issues beyond traditional farm productivity.

There is a question over the basis for funding co-operative cross-sectoral RD&E. Some options canvassed have been partial pooling of RDC funds or the possible diversion of some of the government matching fund contributions that currently go to specific RDCs into a central 'contestable' pool. It is important to note that each of these options has implications (and risks) in terms of:

- Their impact on the long-term R&D capability of different sectors
- Industry level commitment to, and ability to take up, centralised R&D
- The resource requirements needed to secure contestable funds
- The alignment of research capability and programs with industry-specific challenges, and
- The impact that changes in the matching formula may have on the incentive for industry-based investment in R&D via producer levies.

Given these risks (and the national value accruing from rural RD&E) a more attractive alternative means of facilitating enhanced collaboration may be to provide rural industries with access to additional government funding pools in areas of designated national interest (e.g. water, climate). Most likely these additional funds could be contestable. Some specific coordination mechanisms may need to be established for specific cross-sectoral issues. However, these mechanisms should be flexible and time-limited.

In this context, **while collaboration is important it is not an end in itself.** It must be undertaken with the aim of delivering real industry and community benefits.

Also, it will be important that additional outlays on R&D that can meet a legitimate focus on environmental and social outcomes must not undermine the ability of RDCs to maintain their traditional focus on promoting farm level productivity. The increased volatility and uncertainty facing farm systems in recent years is partly due to climate-related factors and their impact on farm confidence and margins. This underlines the importance of securing ongoing productivity gains to support the sustainability of farms and regional communities.

In DA's view **dealing effectively with emerging cross-sectoral challenges will require the continued presence of strong industry-based RDCs**. The unique positioning and capacity of RDCs within the rural innovation system will be crucial to **ensure that higher level knowledge generated in relation to broad challenges like climate change can be translated into specific industry based solutions and innovation.**

### 4.2 Administrative Efficiency issues

All service structures face stakeholder expectations that they will work to deliver their planned program outcomes as efficiently and effectively as possible. In the case of RDCs this expectation has been heightened by recent funding pressures.

The RDCs (through the CRRDC) have taken active steps in this area in recent years, working to develop cost effective strategy development, project evaluation and information sharing processes.

Further work is being explored in areas such developing standardized contracts and on seeking to develop more robust and broadly accepted means of assessing the social and environmental gains from rural RD&E.

One suggested approach to improve administrative efficiency of RDCs has been the co-location of resources and sharing of certain functions by RDCs. In line with this DA is examining opportunities for reducing costs by sharing facilities with Forest & Wood Products Ltd, the only other Melbourne-based RDC. These opportunities will be further assessed at the termination of our respective tenancy agreements.

To assist efficiency DA currently offers other RDCs use of its Melbourne-based administrative services and facilities. It also provides a range of administrative support services to the Dairy Futures CRC on a cost recovery basis to minimise cost overheads in the pursuit of effective R&D outcomes.

While DA believes that it has strong open communication processes in place with DAFF, it will continue to explore ways to improve and streamline these information sharing and reporting processes. This will be important in ensuring there is ongoing clarity about government and community priorities and how bodies such as DA are conforming to them and assisting the joint delivery of successful solutions to identified challenges.

## Appendix 1: List of Abbreviations

| | |
|---|---|
| **ABS** | Australian Bureau of Statistics |
| **ADC** | Australian Dairy Corporation (1975-2003) |
| **ADF** | Australian Dairy Farmers Limited |
| **ADPF** | Australian Dairy Products Federation |
| **ADIC** | Australian Dairy Industry Council |
| **BCR** | Benefit Cost ratio |
| **CRRDC** | Council of Rural Research and Development Corporations |
| **DA** | Dairy Australia |
| **DAFF** | Department of Agriculture Fisheries and Forestry |
| **DEC** | Dairy Extension Centre |
| **Dft** | Dairying for Tomorrow |
| **DPIV** | Department of primary Industries, Victoria |
| **DRDC** | Dairy Research and Development Corporation (1990 -2003) |
| **IPR** | Intellectual property right |
| **NCDEA** | National Centre for Dairy Education |
| **NPV** | Net Present value |
| **PVB** | Present value of Benefits |
| **PVC** | Present value of Costs |
| **M.o.U** | Memorandum of Understanding |
| **NRM** | Natural resource management |
| **PIERD** | Primary Industries and Energy Research and Development Act 1989 |
| **RDC** | Research and Development Corporations |

## Appendix 2: The Dairy Industry and Sustainability

As acknowledged in the national Dietary Guidelines for all Australians, dairy products promote the good health and well being of people. The dairy industry helps to sustain the lives of people and their communities, through the supply of products that deliver essential nutritional building blocks and through the provision of employment on both rural and urban communities. Not only does the dairy industry provide a nutrient rich foundation food that is readily available in convenient and culturally appropriate forms, the dairy industry also makes a significant contribution to Australia's sustainability bottom line.

Sustainability is more than a set of narrow environmental metrics. The social and economic value that the dairy industry offers the community must also be considered as part of the broader sustainability context.

The dairy industry is a user of natural resources. However it also has a long history of environmental stewardship. Underpinning the united industry approach is environmental, economic, and social sustainability. ***The result is an industry that is committed to providing consumers with nutritious dairy products they want, in a way that is environmentally sound, whilst remaining economically viable and socially responsible.***

As a consequence there is shared industry interest in addressing climate change, and the challenge presented by consumer demand for more environmentally sustainable products that still meet all their other needs.

Dairy contributes to the social and economic prosperity of rural Australia, with a large community survey reporting most residents (91%) felt the industry was good for their community (Miller & Buys, 2007).

**Dairy Industry's Global Best Practice & Environmental Sustainability**
The Australian dairy industry is committed to making a positive contribution to global action to address climate change. The industry is committed to engaging all stakeholders in the dairy supply chain to facilitate efforts to reduce greenhouse gas emissions and promote long term sustainable supply of milk and dairy products. The Australian dairy industry as part of these global initiatives will:

- Promote the development of a standard methodology framework for assessing the carbon footprint of milk and dairy products based on robust science
- Promote adoption of world's best practices with the dairy sector and actions that:
    - Lead to the reduction of global green house gas emissions intensity of dairy products
    - Promote the use of technologies and methods that improve the processing and distribution efficiency of dairy products
    - Optimise environmental, social and economic outcomes for dairy stakeholders including the general population whilst recognising different levels of development and local conditions
    - Build on existing frameworks and knowledge, including for scientific advancement and technology transfer
    - Promote decision making based on robust science, and
    - Complement initiatives in other areas of sustainability.
- Seek to advance the establishment of tools to facilitate measurement and monitoring of emissions both on-farm and in dairy manufacturing.
- Promote improved farmer understanding of agricultural emissions and opportunities to reduce greenhouse gas emissions on farm

- Support sharing information and aligning research efforts to develop cost mitigation technologies for both on farm and manufacturing application

**Dairy Industry Global Best Practice Examples**

| Key Areas | Global Examples |
|---|---|
| **Emissions Reduction** | Agricultural Emissions Research<br>Optimising animal feeding<br>Optimising use of fertilisers<br>Optimising manure management – including exploring energy production from manure |
| **Energy Efficiency** | Optimising on-farm energy use<br>Optimised processing to reduce energy inputs<br>Investing in renewable energy |
| **Transport Efficiency** | Optimised milk collections<br>Optimised product distribution<br>Optimised engine performance and driver training |
| **Reduction in loss of milk and milk products** | Shelf life improvements for fresh products<br>Working with retailers and consumers to reduce household waste<br>Energy capture from waste product |
| **Resource Efficiency** | Increase recycling of packaging<br>Use of packaging with the lowest environmental impact<br>Increase recovery of waste |
| **Life Cycle Analysis and Management** | Development of a global standard for measuring monitoring and reducing GHG emissions<br>Working with FAO and ISO |

Dairy Australia assists the industry to meet its commitments under the Global Dairy Agenda for Action on Climate Change through coordination of national programs. As a result a wide range of dairy farming and industry organisations, national and regional dairy associations and businesses across the dairy supply chain are working together to address this important challenge.

**Dairy Industry Action – Farm & Manufacturing**

**Farm Sector Sustainability Programs**

The Australian dairy industry is recognised for its proactive approach to environmental management, an approach that is delivering significant outcomes in terms of on-farm change in environmental practices. Over the last few years the industry has won many environmental awards, the most recent being the Mid Coast Dairy Advancement Group (DAGs) taking top honours in the Environment and Landcare of the NSW/ACT Regional Achievement and Community Awards (2009).

The cornerstone of the Australian dairy industry's success in facilitating on-farm change is the industry-led Dairying for Tomorrow (DfT) program, coordinated by Dairy Australia. Since its establishment, there has been a 25% increase in the number of farmers adopting industry recommended best-practice management of natural resources.

The projects and underlying philosophy of DfT actively encourage collaborative partnerships between the dairy industry and catchment managers to set on-farm targets for change that will contribute to healthy catchments and communities. In recent years projects under Dairying for Tomorrow have changed the way farmers think about their environmental

management and changed how the community looks at the role of farming. Information on regional and national DfT programs is available from the Dairying for Tomorrow website, www.dairyingfortomorrow.com

| **Sustainability Program Examples** | |
|---|---|
| **Regional On-farm Change Programs: -** | Regions have developed or customised industry NRM programs to reflect regional issues and strengths. Programs are based on the DfT learning framework and have the following features; supported change, farmer ownership, collaborative delivery partnerships and high levels of industry and NRM stakeholder support. |
| **Regional Action Plans:** - | Each of the eight dairy regions has a Regional Action Plan to guide NRM investment. Plans are reviewed on a regular basis and all key stakeholders including NRM agencies are involved in the development and review process. |
| **Regional Dairying for Tomorrow Coordinators: -** | The activities of the DfT coordinators have been critical to the success of Dairying for Tomorrow. Since their appointment in 2005 over 30% of Australian dairy farmers have participated in DfT programs, and of these 84% have made significant changes to their management practices. |
| **National tools and frameworks: -** | All industry NRM programs use the dairy environmental self assessment tool, which is made up of 10 modules covering a range of environmental issues including soils, fertilisers, effluent management, irrigation, greenhouse gas emissions, native vegetation and waterways, energy and water in the dairy, pests & weeds, chemicals and farm wastes. It enables farmers to identify where they rank currently for an environmental issue (below, acceptable or above), set targets for improved environmental performance (action planning) and gain access to resources or technical assistance. |
| **National and regional information sharing networks:** - | One of the most valuable activities of the DfT program has been development and maintenance of industry NRM networks. DfT coordinators and Dairy Australia have worked hard to establish formal and informal relationships with NRM agencies, milk companies, state agencies and other relevant stakeholders. |
| **Participatory research and development programs: -** | A core requirement for a sustainable industry is the know-how to manage operations in a manner that maximises resource use efficiency whilst minimising the impact of industry operations on the environment. DfT research programs in water use efficiency, soils and nutrient management and climate change adaptation and mitigation ensure the relevant science is undertaken to provide rigour to on-farm change and catchment outcomes. Farmer and stakeholder participation is actively encouraged to ensure innovation is captured from farmer through to researchers. |

### Dairy Farm Sustainability Achievements

Considering that the development of metrics/indicators for on farm environmental sustainability is in its infancy and the difficulty of extracting and collating data from over 8000 farms with a diverse range of practices, data on measuring achievements to date is limited. What is of note is the rate of participation in the programs outlined above to modify and enhance the environmental impacts of on-farm dairy products.

| **Examples of achievements include:** | |
|---|---|
| **Fertiliser Use, Soil Testing, & Waterways** | • There has been a significant increase in using a scientific approach to fertiliser use, for example soil testing is now conducted by 83% of farmers.<br>• Soil testing is the key to reducing fertiliser use and prevention of nutrient run off into water ways. |
| **Biodiversity & Revegetation** | • More than half of all dairy farms have implemented a revegetation program in the past 10 years.<br>• Remnant native vegetation is more likely to be fenced off in recognition of the need to protect such areas. |
| **Water Use & Efficiency** | • Generally water use efficiency has improved markedly from 5.5ML/ha to 4ML/ha.<br>• Response to drought has been a big driver in this reduction |

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As programs and uptake continue environmentally sustainable farm practices look set to be a future cornerstone of the Australian dairy industry.

### Dairy Manufacturing Sustainability Programs

The dairy Industry supports a comprehensive government and industry response to climate change. The industry has made adapting to climate change a strategic priority.
In line with this, dairy manufacturers are improving their ability to manage their environmental performance by participating in a range of government-led voluntary and compulsory programs to refine their environmental management systems and to work with external parties to improve environmental performance. All larger (and many smaller) companies have also begun to employ dedicated environmental managers who are responsible for meeting regulatory compliance requirements and minimising the environmental impacts of their food production systems.

Environmental performance in the dairy manufacturing sector analyses two main areas of environmental impact:

- Water, energy and chemicals consumption, solid waste, waste water production and packaging usage.
- Environmental practice – environmental management systems, participation in environmental programs, site-specific environmental issues of concern, investment in environmental management and incidents and complaints received.

Dairy manufacturers have committed to assess their environmental performance every three years as part of continuous improvement cycle. The last available report was the Australian Dairy Industry Sustainability report for 2007/08 This report assessed dairy manufacturing's overall environmental performance and compared this to previous year outcomes. The report showed there had been combined industry investment of over $27 million in the three years prior to the report which focused on reducing and better managing:

- Consumption of water, energy and cleaning chemicals;
- Generation and treatment of wastewater;
- Generation of emissions and solid waste; and
- Water recycling and packaging

Some of the report's findings are set out below

| **Examples of Dairy Manufacturing Sustainability Performance Achievements within the three year period (2003/2004 – 2007/2008) include:** | |
|---|---|
| **Water** | • 26% water consumed is recycled<br>• Fresh water consumption has been reduced by 440ML |
| **Solid Waste** | • Solid waste going into landfill has been reduced by 880t<br>•<br>• One-third of solid waste is recycled (2007/08) |
| **Wastewater** | • Half of wastewater is used to irrigate local farm land<br>• Waste water generation has been reduced by 550ML |
| **Chemicals consumption** | • Chemical usage has been reduced by 200t |
| **Greenhouse gas emissions** | • Greenhouse gas emission have been reduced by 6,000t |

A follow up report and review process is under way and expected to be completed in late 2010. This is expected to show further positive gains in industry performance, reflecting the ongoing investment in sustainability programs and environmental management performance

## Appendix 3: References


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