

Towards a Template for Benchmarking the International Competitiveness of Australia's Agri-Food Industries

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Contents

- 1. Introduction**
- 2. The Case for Measuring International Competitiveness**
 - 2.1 Business and Industry Competitiveness**
 - 2.2 Agri-food Chains**
- 3. Towards a Template**
- 4. Prototypes and Pilots**

References

Attachment 1: Project Outline

Attachment 2: Dairy Industry Indicators

Abstract

Key Words: competitiveness, benchmarking, whole-of-chain, triple-bottom-line, agri-food industry policy

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Abstract:

The mutual interest of industry and government to improve the competitiveness of agri-food industries presents an information management challenge for leaders and policy makers. The paper examines the case for a template for benchmarking economic, environmental and social indicators along agri-food chains as an aid to strategic planning and policy.

Porter's competitiveness 'diamond' is the structural framework for identifying relevant indicators. The paper identifies desirable features for the template, including: a mix of lagged or outcome measures and lead indicators or drivers; a mix of quantitative and qualitative indicators; bias to graphical illustration of trends and interpretation oriented to planning and policy issues and implications.

The paper identifies benchmarking of best practice firm and chain case studies against industry survey data as the micro-macro linkage critical to appreciation of industry competitiveness. Some dairy industry indicators and data are used to illustrate the scope, content and style of a competitiveness template to meet the needs of the target clientele.

Introduction

This paper is part of preliminary work for a proposed national project to develop a template for benchmarking the international competitiveness of Australia's agri-food industries. Options to respond to funding difficulties (including the deficiencies of the user-pays system), the degradation of public agricultural statistical databases and changing needs for rural and regional information have been considered at various forums, including ABS National AgStats Summits in 2003. A National AgStats Centre based on a joint public-private sector funding model was among the options.

In recent years the South Australian Government and our department have been developing and implementing a tiered system of strategic planning and policy, including a State Strategic Plan (2004), a State Food Plan (2001), a State Export Plan (2004), PIRSA's Industry Development Framework based on Porter theory (2002) and various Agri-food Industry Development Strategic Plans, including Dairy (2002 and 2004), Piguemeat (2004), Eggs (2003), Sheep (2004), Goats (2003) and Beef (2004). Commitment to strategic planning has emphasised the need for tools such as agri-food chain scorecarding to monitor progress towards goals. In this context the need for measuring (or measures of) the international competitiveness of Australia's agri-food industries on a consistent basis has arisen.

Improving food freight logistics and bilateral trade agreements continue a gradual opening of world agri-food trade possibilities despite stiff resistance about more liberal agricultural trade within WTO (world Trade Organisation), especially by developed countries. The globalisation of agri-food is part of affiliations and agreements favouring freer trade, which focuses the attention of governments and industries in many countries on the international competitiveness of their businesses and industries. In Australia, bilateral 'free trade agreements' with New Zealand, Singapore, Thailand and the United States are tangible evidence of progress, when improvements via international agreement appear illusive.

The paper is in several parts:

1. The Case for Measuring Competitiveness. The case for measuring the international competitiveness of agri-food industries.
2. Towards a Template. Specifying the desirable features of a competitiveness template.
3. Prototypes and Pilots. Specifying the template and the building of a prototype with some example indicators in a pilot industry, the dairy industry.

1. The Case for Measuring Competitiveness

1.1 Business and Industry Competitiveness

Prior to Porter's treatise on *The Competitive Advantage of Nations* there was little agreement on what constituted industry competitiveness and little economic theory to aid resolution of the debate (Porter, 1990). Porter found that businesses gain and sustain strategic advantage through improvement, innovation and upgrading. Porter defined four broad determinants of competitive advantage:

- Factor conditions;
- Demand conditions;
- Related and supporting industries, and
- Firm strategy, structure and rivalry.

In addition, Porter recognised that 'chance' and 'government' also influence competitiveness.

Porter also placed industry competitiveness in context, linked up to national competitiveness and back to business competitiveness. Collectively, national, industry and business competitiveness affects community standards of living through effects on wealth, income and employment. Without reference to sustainability, industry competitiveness is a deficient concept, where it is possible to achieve private profits at public cost; a territory encapsulated in the concept of net public benefit. Esty and Porter's (2003) research showing better outcomes, economically and environmentally, where environmental regulation exists is a clear example of mutualism, with the authors endorsing a holistic approach.

Conceptualisation of the 'triple bottom line' by Elkington (1999) has been influential in lifting corporate responsibility for environmental and social impacts, internalising the 'externalities'. As might be expected however, conceptual commitment to the 'triple bottom line' has been easier than adoption of triple bottom line accounting. Dasgupta (2002) is among those seeing the adoption process having some distance to go while nations continue to report national accounts in conventional economic terms, when their deficiencies in terms of sustainable development have been accepted and explained by eminent economists.

In Australia, the push is on for the metrics to catch up to in-principle agreement by governments and industry that development impacts need to be assessed on a range of criteria. For developments to deliver real progress requires environmental and social measures as well as financial and economic. At AARES and PIRSA seminars in 2003 Dr Ian Wills, of Monash University referred to eminent US economist Robert Solow observing that sustainability is a vague concept. Wills noted that there are strong and weak interpretations of sustainability.

Irrespective, sustainability is appreciated to be integral to consideration of industry competitiveness in the twenty first century.

Given the dynamic and complex nature of competitiveness, economist, Lynn Salinger, has observed that it is easier to talk about the factors influencing competitiveness than to actually measure competitiveness (Salinger, 2001):

While the competitiveness of firms or industries may be easily described, it is less easily measured. Evaluations of productivity, comparative advantage, and competitiveness require detailed microeconomic research which examine cost structures, technical coefficients of production, levels of output relative to those inputs, and distortions in the economy which affect each of these. They also require examination of firm strategies for acquisition of inputs and raw materials, utilization of labor and capital, access to new technologies, development of new products, pursuit of markets, interaction among their partners and rivals, and interaction with the government sector.

Salinger contrasts cost-competitive studies with 'Porterian' competitiveness analyses:

This cost competitiveness approach used by Siggel et al. in Uganda/Kenya and Cockburn et al. in Mali/Côte d'Ivoire is helpful for understanding broad patterns with respect to protection, the effect of exchange rates on shadow costs, and patterns of productivity across industries. However, such an approach is less apt for understanding qualitative, management, or industry-specific factors affecting competitiveness.

Salinger concluded her overview of competitiveness research in favour of analyses grounded in industry specific knowledge:

The follow-on research agenda is clear. We need to undertake more in-depth survey work within industries and firms to understand how entrepreneurs in Africa cope with the various constraints they face. Such survey work needs to be done using a systems approach to the analysis of competitiveness, in order to understand the direct and indirect factors affecting the firm, the supply chain, the industry, and the meso- and macro-economies within which the firm operates. We need to identify the best management practices among firms with respect to such things as:

- hiring and firing of workers,
- training workers at all levels of the firm,
- establishing output incentives,
- innovating new processes to improve efficiency,
- accessing information about and use of new technologies,
- increasing firm capacity use rates,
- developing new telecommunications and transportation strategies,
- managing global supply networks,
- marketing creatively,

- developing new products at higher price points,
- negotiating trade and business agreements,
- servicing overseas clients,
- building professional coalitions domestically,
- reaching out to professional networks internationally, and
- lobbying policy makers.

Although the African clothing industry is exotic to Australian agriculture, Salinger's support for industry studies which include identification of business and supply chain best practice is relevant.

1.2 Agri-food Chain Competitiveness

Agri-food industry structural adjustment in the form of horizontal and vertical integration and alliances continues to concentrate the sector and shorten food chains to achieve scale efficiencies and product differentiation as well as the desired control of food integrity and safety. Accompanying the trend to agri-food chains and contract farming is a decline in information transparency along the food chain (Spencer, 2004). Industry funded 'whole-of-chain' industry benchmarking that was evident in the 1990s has lapsed, with a decrease in available data and an increase in costs as factors. Farm business benchmarking remains a 'perspective tool' in the suite of services typically offered by agribusiness consultants to farmers.

The paradigm shift to contract agriculture combined with a degradation of public agribusiness databases (ABS and ABARE) is exposing a gap in industry level knowledge about agri-food industries and chains. In the context of supply chain management, Dunne (2001) recommends agribusiness researchers recognise that:

- Industry structure and performance is not the correct focus for research;
- That the firm and its place in a specific supply chain has the major impact on competitive position, and
- That qualitative research methodologies have a legitimate role to play.

With State and Commonwealth Government commitment to domestic deregulation (National Competition Policy) and less restrictive international trade (WTO) the role of government with industry has shifted to facilitation of industry development and adjustment. And within this policy area the tools are joint strategic planning and adjustment packages in extraordinary and exceptional circumstances rather than financial incentives and subsidies for businesses.

To avoid benchmarking (or scorecarding) of industry competitiveness becoming an exercise in random numbers it is best viewed as a complement to strategic planning. A pattern of engagement in the context of strategic planning by government and industry has been developing in South Australia in recent times. The recent launch of a

State Strategic Plan in South Australia adds a plan at the apex of a state food plan and regional and industry strategic plans

In the context of government-industry cooperation in tiered strategic planning from State, to Agri-Food Sector, to Industries and Regions, information about industry competitiveness remains relevant and important. However, recognition that industries in the twenty first century are mainly being re-shaped by business level activity in the context of agri-food chains, suggesting that a multi-pronged approach to benchmarking industry competitiveness is needed.

2. Towards a Template

See attachment 1 for an outline of the project.

3. Prototypes and Pilots

See attachment 2 for an example set of indicators for the dairy industry.

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Project Outline for a National System for Benchmarking the International Competitiveness of Australia's Agri-Food Industries

Sections:

- 1. Why Benchmarking Should Underpin Efforts to Maintain Competitiveness**
 - 2. What Should a National Benchmarking System Measure?**
 - 3. How Will the System's Results be Achieved?**
 - 3.1 Principles**
 - 3.2 Proposed Model**
 - 3.3 Proposed Process**
 - 4. Costs**
 - 4.1 Establishment Costs**
 - 4.2 Existing Data Sources**
 - 4.3 Possible Developments**
 - 4.4 Annual Running Costs**
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- 1. Why Benchmarking Should Underpin Efforts to Maintain Competitiveness**
 - Agriculture-related industries form a significant part of the Australian economy. For example, Net Food Revenue from the National Food Industry ScoreCard is \$88.5 billion per annum.
 - There is a near-consensus that the sector has much untapped potential for *sustainable* economic growth. Accordingly, Australian governments invest at least \$2 billion p.a. in helping industry to capture that potential. Both directly and via levy systems, industry incumbents also invest heavily.
 - Despite the investment over many years, many are disappointed both in the inability of the sector (or most of it) to capture the apparent potential and in the erosion of its sustainability.
 - While progress has been made, there remains a paucity of systematic approaches to diagnosing the problems to be addressed or monitoring the return on investments made.
 - Cross-industry and cross-jurisdictional assessment shows a great many common themes in the problems faced.
 - A standardised national benchmarking system for measuring and monitoring international competitiveness of Australia's agri-food industries would greatly enhance the industry-development

dialogue between jurisdictions, agencies and between industry and government.

- The primary purpose of such a system would be to inform the work programs of industry development agencies of COAG governments. However, industry organisations are major investors in this information and would be potential partners.
- It should assist both in negotiation of strategic priorities and Government programs with relevant industry groups and in coordinating Government and industry work programs across jurisdictions.
- A national, 'public/private', benchmarking system is the best strategy for overcoming present data-set weaknesses and establish an on-going system for comprehensive reporting and determining trends.

2. What Should A National Benchmarking System Measure?

- The near-consensus on untapped potential in the sector extends, with good reason, to its primary source: improved value-chain linkages for increased domestic value adding. To address this, data is required on why competitive pressures are not forging those links to the extent expected. While cost-competitiveness in farm produce is important to understand, data on structural problems that inhibit value-chain formation is considered primary.
- Thus, the system should provide insights into *all aspects* of the sector's international competitiveness. For this, Michael Porter's "Diamond" model is proposed as the most all-embracing and widely accepted approach. Importantly, it emphasises the dynamics of inter-firm collaboration and rivalry.
- Accordingly, a whole-of-value-chain focus is needed. Much present reporting is comprehensive at farm-gate level, but weak at value-adding and (non-commodity) export level.
- Since sustainability of the progress made is precarious, the system should include a mix of economic, environmental and social indicators (i.e. "Triple Bottom Line"). Oregon State's benchmarking process provides a useful model.
- A hierarchy of indicators is required: national, State/regional, value-chain/firm to ensure relevance to all decision-makers in the industry development dialogue.
- It should include lead indicators (focusing on "drivers of profitability and change") to give diagnostic power and lag indicators (focusing on results achieved) to assist monitoring of program performance.

3. How Will the System's Results be Achieved?

3.1 Principles

- The emphasis should be on measuring *key determinants* of competitiveness and progress, rather than industry features for which data is readily available.
- To ensure relevance to dialogue participants, the system should include:
 - a Macro Perspective: trends at the national/State/regional/industry level for issues considered important from Porter analysis;
 - a Micro Perspective: key drivers of chain/firm profitability; and
 - a means of highlighting the links between macro and micro perspectives.
- Benchmarking has significant costs:
 - Direct costs of collection and analysis; and
 - Imposition on survey respondents.
 - Consequently, existing sources should be used where possible.

3.2 Proposed Model

- Key to success: the system should be based on industry-government collaboration.
- Many industry participants currently engage in consultant-orchestrated benchmarking programs. All consultants that were interviewed endorsed the idea of using this data as the basis for cost and profitability benchmarking. Indeed, for post-farm-gate firms, it is probably the only source of valid data.
- Randomised surveys, such as ABS Agricultural Census and ABARE Farm Surveys, will be necessary to remove the bias in user-pays benchmarking.
- Figures 1a & 1b provide a diagrammatic representation of a system that would include both the macro and micro perspectives.
- The 'micro perspective' is a well-accepted farm benchmarking system developed by Gordon Cleary, FarmStats Australia Pty Ltd, who has trained more than 1,000 dairyfarmers in its use. It shows the causal flows from detailed items of farm management performance to overall return on capital or equity. It allows analysis of how sensitive overall return is to each indicator benchmarked. This shows the relative importance of each indicator.
- Figure 1 is indicative only. For example, it does not include cash-flow and other indicators of shorter-term viability.
- Table 1 shows the links between the micro- and macro-level indicators. The model will link, for example, the impact of policy

changes on asset prices or on the availability and quality of water and labour to micro-level farm performance.

- This linking is central to the working of the model:
 - It informs all stakeholders about the importance of specific policies and other macro changes to industry profitability and growth. This should raise the quality of the industry development dialogue.
 - It should increase the robustness and diagnostic power of the micro-level benchmarking, encouraging higher participation rates.
 - One can expect a “virtuous cycle” as improved decision-making at both firm and policy levels generates more participation and better data which, in turn, will improve decision-making.
- Many of the macro-level indicators will be micro-level indicators aggregated to industry, State or national level.
- Such data is the only basis for estimating the existence and size of untapped potential – i.e., factoring up a sample of best-practice value chains and comparing that result with existing industry value-chain ScoreCard data will provide a basis for the dialogue about what is achievable.

3.3 Proposed Process

- Four stages:
 - System design: consultancy to develop a system based on the concept herein.
 - Negotiation with relevant stakeholders, including:
 - Public and private information providers (ABS, ABARE, World Economic Forum, accountancy and consultancy firms, et al.)
 - State and Commonwealth Government agencies;
 - Industry organisations.
 - Pilot implementation: one to three national industries.
 - Full implementation across all sectors or, at least, all major sectors.
- PISC-sponsored national steering committee of delegates from all jurisdictions whose role is:
 - oversight of design consultancy;
 - negotiation as above;
 - oversight and coordination of implementation.

4. COSTS

4.1 Establishment Costs

- Design: Consultancy – (very) approximately \$200,000. This would include discussion with all stakeholder organisations (listed above) to canvass enthusiasm and issues to be resolved.

- National Steering Committee: funded from existing agency budgets.

4.2 Existing Data Sources

- The required data and analysis would mostly come from existing information providers:
 - Government agencies (ABS, ABARE, BRS, etc.) may be asked to review priorities and change questions in existing surveys.
 - Some existing data products can be accessed at minimal cost: KPMG Business Cost Survey, World Economic Forum Competitiveness Report.
 - Consultancy firms have expressed interest in forming a national consortium to standardise data from existing benchmarking studies and deliver a uniform product.
- Government agencies, industry organisations and private firms already invest heavily in compiling this information. The issue is the lack of a unifying system to maximise its value.

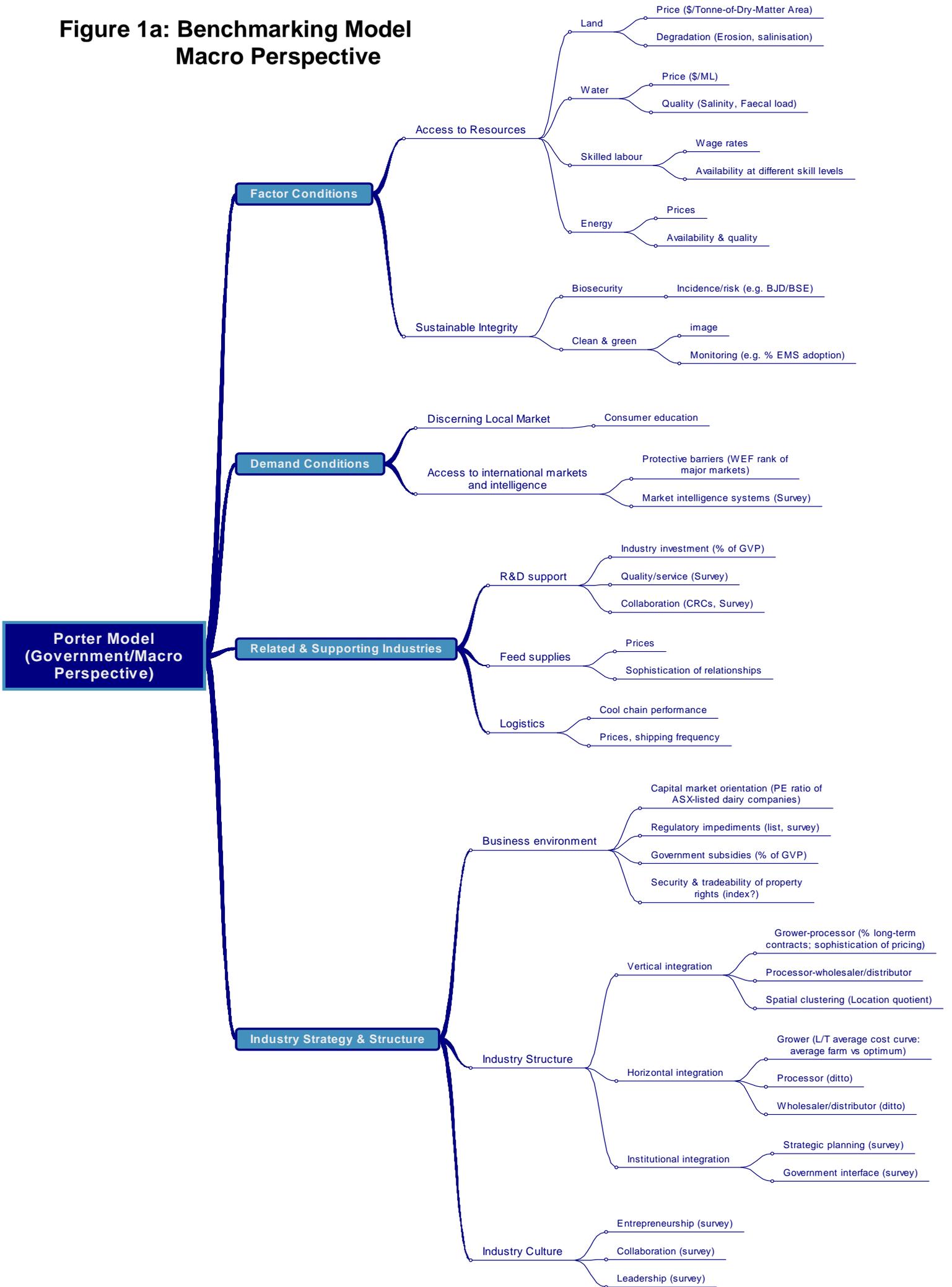
4.3 Possible Developments

- Dennis Trewin, Chief Statistician (ABS), has canvassed the idea of a *National Centre for Agricultural Statistics*. An agency of this sort (with focus changed to *Agriculture-related* or similar whole-of-chain concept) could be given, as a primary brief, the task of delivering the information needed by governments and industry organisations to make astute industry development investments (and monitor those investments). This would give it long-term oversight of the system.

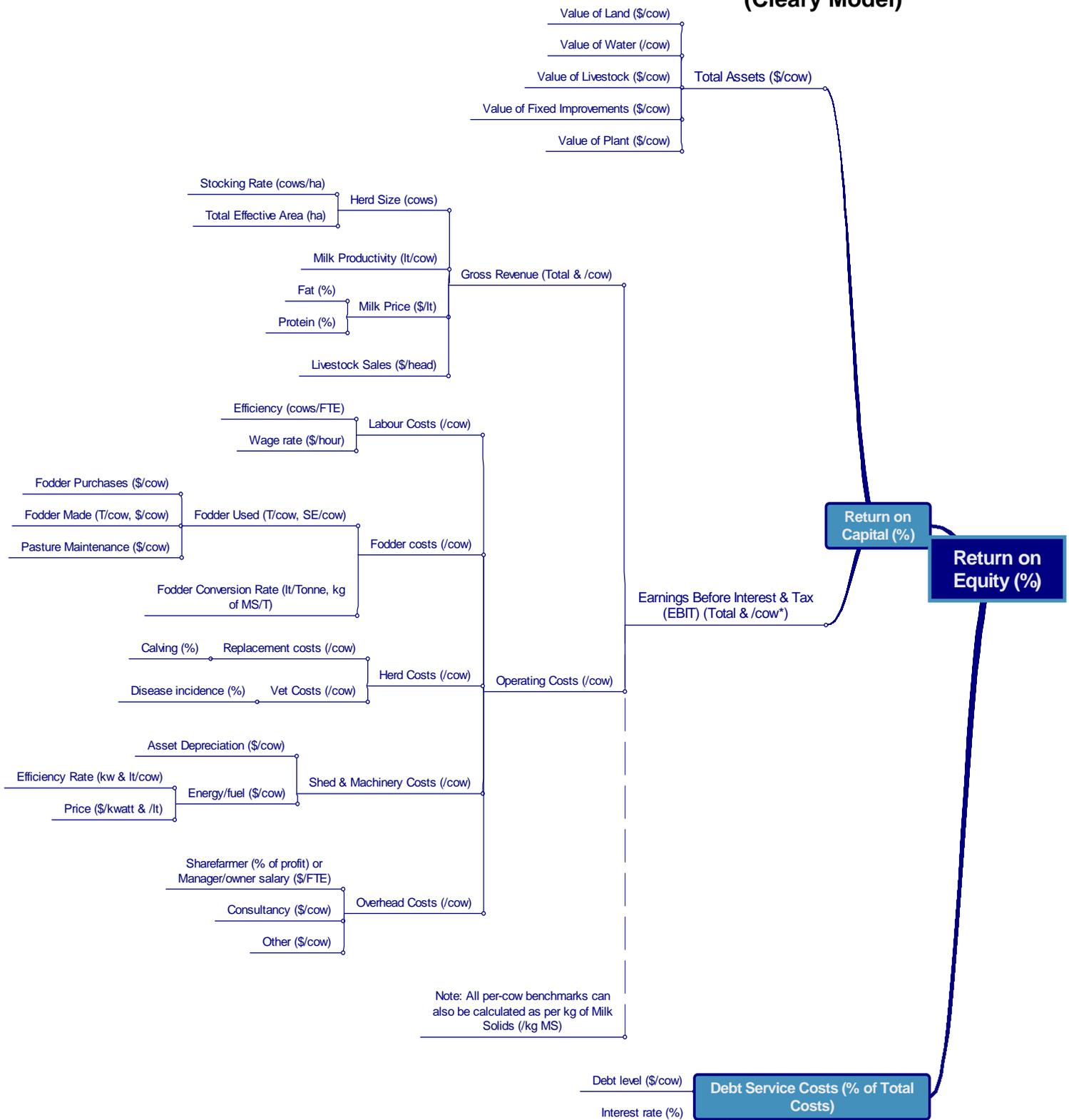
4.4 Annual Running Costs

- The total cost of running the system has not been estimated, but it is plausible that the required benchmarking data could be delivered by exploiting synergies between existing data gathering and analysis systems of the stakeholders listed above.

**Figure 1a: Benchmarking Model
Macro Perspective**



**Figure 1b: Benchmarking Model
Micro (Firm) Perspective
(Cleary Model)**



Concept Source: Gordon Cleary
FarmStats Australia Pty Ltd

Table 1: Links between Porter Model (Macro/Government Perspective) and Cleary Model (Micro/Firm Perspective)

Porter Condition	Measurable Macro-level Indicator	Macro-level Benchmarks	Related Micro-level Indicators
Factor Conditions			
Access to Resources			
Land			
	Price	\$/Tonne-of-Dry-Matter Area GIS-sourced indices	Value of land, Stocking rate Total effective area (% lost to production)
	Degradation (Erosion, salinisation)		
Water			
	Price	\$/ML per exisiting monitoring	Value of water rights Manure management costs
	Quality (Salinity, Faecal load)		
Skilled labour			
	Wage rates	\$/hour Survey	Wage rates Labour efficiency
	Availability at different skill levels		
Energy			
	Prices	\$/kwatt, \$/mj Survey	Energy costs Average shed throughput
	Availability & quality		
Sustainable Integrity			
Biosecurity			
	Pest & disease Incidence/risk (e.g. BJD/BSE)		Vet costs, Milk productivity, Calving rate, Death rate
Clean & green image			
	Monitoring	e.g. % EMS* adoption	Costs of QA & EMS systems, Milk price & rejection rate
Demand Conditions			
Discerning Local Market			
	Consumer education	Survey	Industry levies (Industry-level activity), Processor marketing costs
Access to international markets and intelligence			
	Protective barriers	WEF* rank of major markets	Processor: sales growth, profitability
	Market intelligence systems	Survey	
Related & Supporting Industries			
R&D support			
	Industry investment	% of GVP	Industry levies; Processor R&D costs
	Quality/service	Survey	Processor: R&D costs, sales growth & profitability
	Collaboration	CRC* data, Survey	
Feed supplies			
	Prices	\$/starch equiv., \$/protein equiv. Survey	Fodder purchase costs Fodder conversion ratio
	Sophistication of relationships		
Logistics			
	Cool chain performance	Survey	Processor: shipping costs, product losses, customer satisfaction
	Prices, shipping frequency	Survey	
Industry Strategy & Structure			
Business environment			
	Capital market orientation	PER* of ASX*-listed dairy firms	Costs of equity & loan capital
	Regulatory impediments	List, survey	Compliance costs
	Government subsidies	% of GVP*	Operating costs, Land & water prices
	Security & tradability of property rights	Index?	Land & water prices, Borrowing costs
Industry Structure			
Vertical integration			
	Grower-processor	% long-term contracts; sophistication of pricing Location quotient	Customer satisfaction: Product prices, Supply security; Borrowing costs; QA & other relationship costs Competitiveness: sales growth & profitability
	Processor-wholesaler/distributor		
	Spatial clustering		
Horizontal integration			
	Grower	L/T average cost curve: average firm vs optimum	Herd size, Unit cost, Attractiveness as strategic-alliance partner, Return on Capital
	Processor		
	Wholesaler/distributor		
Institutional integration			
	Strategic planning (industry level)	Survey	Sales growth, Confidence in long-term profitability, Costs of equity & loan capital
	Government interface (industry level)	Survey	
Industry Culture			
	Entrepreneurship	Survey	Attractiveness as strategic-alliance partner, Unit costs, Costs of equity & loan capital, Return on Capital
	Collaboration	Survey	
	Leadership	Survey	

Acronyms: EMS - Environmental management system
 WEF - World Economic Forum
 CRC - Cooperative Research Centre
 PER - Price-to-Earnings Ratio
 ASX - Australian Stock Exchange

Appendix 1: Existing Data Sources

See Table 2 below.

Existing data sources for the system include:

- World Economic Forum:
 - annual survey-based qualitative benchmarks
 - will need a small subsidy to improve survey response level.
 - data currently used by Invest Australia in international advertising.
- KPMG *CEO's Guide to International Business Costs*:
 - biennial analysis of location-sensitive business costs in 121 cities across 11 countries.
 - city inclusion is on a subscription basis. Currently Adelaide, Brisbane, Canberra, Melbourne and Sydney subscribe.
- ABS:
 - collections include: National Census, Agricultural Census, special surveys.
 - data on: GDP, employment, education & training, farm & processor production, productivity, water use, etc.
- William M. Mercer Quality of Life Index
- NFIS *Survey of Food and Beverage Manufacturers*:
 - conducted for NFIS by BIS Shrapnel in August 2003 to form initial benchmarks for future studies.
- ABARE *Farm Surveys*:
 - annual survey of about 1,400 broad-acre farms covering the grain and livestock industries in six ANZIC industry classes.
 - very long and comprehensive time series (about 40 years) of financial, production and input data.
 - Needs financial bolstering to maintain sample size and research quality.
- NFIS/PIRSA Food Industry ScoreCards:
 - national system recently developed.
 - 6-year history of Economic ScoreCards in SA
 - environmental and social indicators being developed
- Private-sector benchmarking studies:
 - Numerous private agribusiness consultants conduct benchmarking studies for their clients.
 - One SA firm benchmarks all 300 of their farm clients to assess focus of consultancy and measure performance. They are networked with interstate consultants who do likewise.
 - Accountancy firms provide benchmarking services to clients. (Deloittes do one for wineries.)
 - These studies are a potentially valuable source of industry-level data, particularly for identifying best-

practice and average-practice indicators – and measures of performance dispersion for those indicators.

- Anonymous indicative data of this sort should be procurable at reasonable marginal cost for the additional work required to compile industry-level benchmarks.

Table 2: Examples of Lead and Lag Indicators at Different Levels

Benchmarking Level	Lead Indicators: Drivers of Competitiveness	Lag Indicators: Results of Competitiveness
National/State	<ul style="list-style-type: none"> • World Economic Forum (score/ranking): <ul style="list-style-type: none"> ○ Infrastructure quality (Resource Access) ○ Education levels & systems (ditto) ○ Environmental management (Sustain'ty) ○ Domestic competition (Business env't) ○ Innovation & diffusion (Industry structure) ○ Institutional strength & efficiency (ditto) ○ Cluster development (ditto) ○ Sophistication of company operations & strategy (Industry structure & culture) • <i>KPMG Guide to Business Costs</i>: <ul style="list-style-type: none"> ○ Two relevant sectors analysed: Food Processing & Biomedical R&D ○ Cost index & ranking for capital cities 	<ul style="list-style-type: none"> • GDP growth • Employment rates • Mercer Quality-of-life Index
Industry/Sector	<ul style="list-style-type: none"> • <i>NFIS Survey of Manufacturers</i>: <ul style="list-style-type: none"> ○ % undertaking R&D activities ○ % training staff on supply-chain issues ○ % with impediments to food safety systems ○ % exporting; % increasing exports ○ % using Government to help resolve market-access issues ○ % with environmental mgt systems • Best practice vs industry average (& indicators of dispersion): <ul style="list-style-type: none"> ○ Return on capital & on owner equity ○ Productivity growth ○ Long-run average cost of key products ○ Investment ratios: plant:land, debt:equity, sales:capital. ○ Water-use efficiency (irrigation and dry-land enterprises) (Sources: ABARE Farm Surveys & private-sector benchmarking programs) 	<ul style="list-style-type: none"> • National Food Industry ScoreCard (for each sector): <ul style="list-style-type: none"> ○ Industry/s ○ sector growth ○ Industry/s ○ sector export growth ○ Growth in ○ % value-added ○ Employment ○ ent ○ Water/en ○ ergy consumption ○ Greenho ○ use gas emissions ○ Water ○ quality ○ Waste ○ generated
Value Chain/ Firm	<ul style="list-style-type: none"> • Per Micro Perspective (Figure 1b) • Qualitative indicators of best vs "normal" practice via case-study analysis: <ul style="list-style-type: none"> ○ .g. how best chains minimise transaction costs along chain (including waste, off-spec. products, delays in delivery & payment, poor feedback on change in consumer preferences). 	<ul style="list-style-type: none"> • Firm profitability & growth

Attachment 2

Dairy Industry Indicators

(separate hand-out in session)