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

Indicators to measure Industry Competitiveness

Dairy Industry Case Study

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Corporate Strategy and Policy
Primary Industries and Resources SA

PRIMARY INDUSTRIES AND RESOURCES SA

Government of South Australia

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Factor Conditions

Related and Supporting Industries

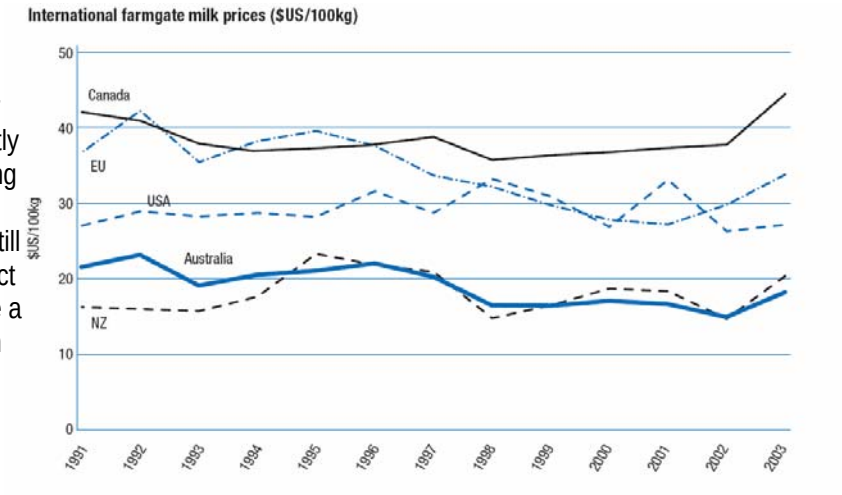
Section 2: Micro (Firm) Level Indicators

Indicator # 1	Demand Conditions

Local Market - Australian Milk Prices

Trends:

Historically, the price farmers received for drinking milk in each State was significantly higher than that received for manufacturing milk until full deregulation in July 2000. While higher prices for drinking milk are still received under commercial supply contract arrangements, many farmers now receive a 'blended' price, incorporating returns from



Dairy Australia (2004) *Australian Dairy in Focus, 2004.*

Issues:

- Lack of formal legislative control over the price processing companies pay farmers for milk. Farmgate prices can vary, with returns being affected by factors such as product and market mix, marketing strategies and processing efficiencies. Most milk prices are based on both the milk fat and protein content of fresh milk.
- Payments from processors to individual farmers can also vary marginally, as firms operate a range of incentive/penalty payments relating to milk quality, productivity and out-of season supplies.
- The inflation-adjusted farmgate price trend is in line with other farm based commodity product prices over the last

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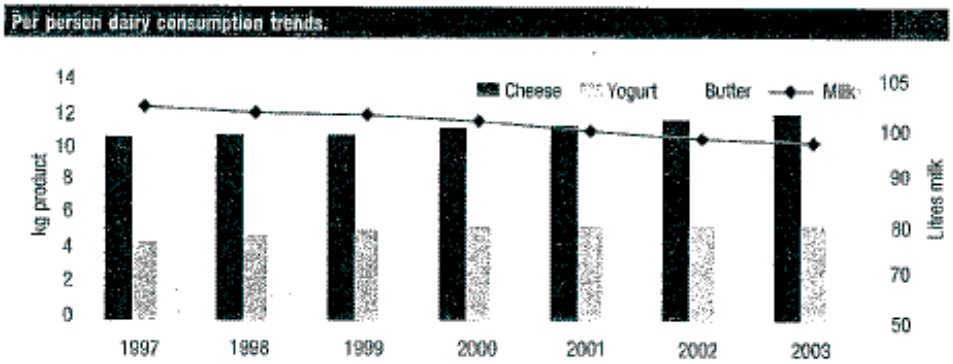
No # 2	Demand Conditions

Local Consumption - Dairy Consumption Trends

Trends:

Increased preference for lower fat content lines and growing interest in UHT (long-life) lines.
As Government regulation in this sector is reduced, there is likely to be increased marketing effort by individual milk processors.



Dairy South Australia, Dairy Strategic Plan 2004 – 09,

Issues:

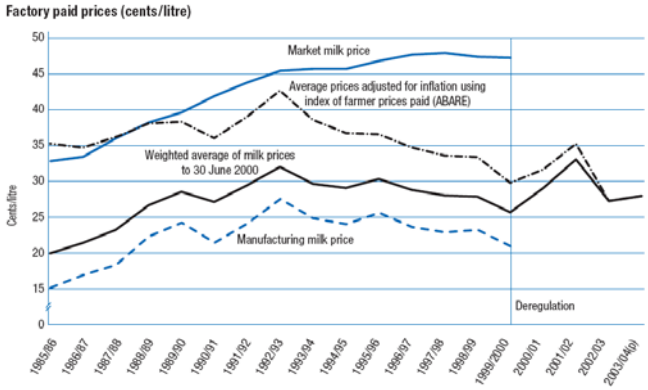
- In line with international trends, there has been a general trend toward increased cheese and whole milk powder production ie allowing manufacturers to lessen dependence on butter and skim milk powder. However, the ability to shift toward cheese and whole milk powder is influenced by total manufacturing milk availability and market opportunities.
- The Australian dairy industry manufactures high-quality dairy goods for domestic consumption and export,with the focus on butter, cheese and milk powders. More recently, however, manufacturers have increased production of specialty and short-shelf life products in response to changing consumer demands.
- There has also been increased production of whey powders and whey protein concentrates. This reflects environmental concerns and increased interest in the specialist food ingredient market. Increased interest in the food ingredient sector is reflected in increased new product development and modifications. (Source - Australian Dairy Industry 1998)

Indicator # 3	Demand Conditions

International markets – International Farm Gate Prices

Trends:

At an average of approximately US$20 per 100kg of milk, Australian dairy farmers receive a low price by world standards, and so must operate highly cost-efficient production systems.



Dairy Australia (2004) *Australian Dairy in Focus, 2004.*

Issues:

- Australian Farms in International Farm Comparison Network studies consistently have costs of production averaging less than US$20 per 100kg of milk, placing them in the lowest cost category of all the farms participating in the survey. Farms from Europe have production costs greater than US$30 per 100kg of milk.

- Reflecting this high level of competitiveness, more than half Australia's milk production is exported to more than 100 countries around the world and its share of the world dairy trade is increasing steadily

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Indicator # 4	Demand Conditions

International markets – International Milk Production and Exports

Trends:

Global milk output is estimated to grow by about 1.9 percent in 2004 compared to only 1.1 percent in 2003, largely as a result of increasing production in Asia and Latin America, as well as in New Zealand.

Issues:

Global milk output is estimated to grow by about 1.9 percent in 2004 compared to only 1.1 percent in 2003, largely as a result of increasing production in Asia and Latin America, as well as in New Zealand.

For the 2004/05 dairy year, export supplies of dairy products are anticipated to be higher from New Zealand. As Australia's milk output still has not recovered from low levels in the past year, exports will be down again. For 2004, its exports of whole milk powder and skimmed milk powder are estimated to fall by 18 and 14 percent respectively, and butter exports to be down 24 percent.
However, export availabilities from South America in 2004 have expanded as production has recovered from the low levels. Exports of whole milk powder from Argentina may rise over 70 percent. Exports by the EU have increased in 2004, particularly for butter and whole milk powder, and cheese. In the United States, net removals of product have been lower in 2004, but exports of some dairy products have been higher given high international prices.

Milk Production

	2002	2003 [1]	2004 [2]
	(..million tonnes..)		
WORLD	**593.6**	**600.1**	**611.5**
EC	126.7	126.8	125.5
India [3]	84.6	87.0	91.3
United States	77.1	77.2	77.5
Russian Fed.	33.5	33.3	31.9
Pakistan	27.7	28.4	29.1
Brazil	22.8	23.5	24.4
China	14.0	17.5	21.0
New Zealand [4]	13.9	14.4	15.0
Ukraine	14.1	13.6	13.6
Poland	11.8	11.9	11.9
Mexico	9.6	9.9	10.0
Australia [5]	11.3	10.3	10.0
Argentina	8.5	7.9	9.5

Source: FAO
[1] Provisional [2] Forecast
[3] Dairy years ending March of the year shown.
[4] Dairy years ending May of the year shown.
[5] Dairy years ending June of the year shown.

Dairy market Assesment (2004), Food and Agriculture Organisation of the United Nations

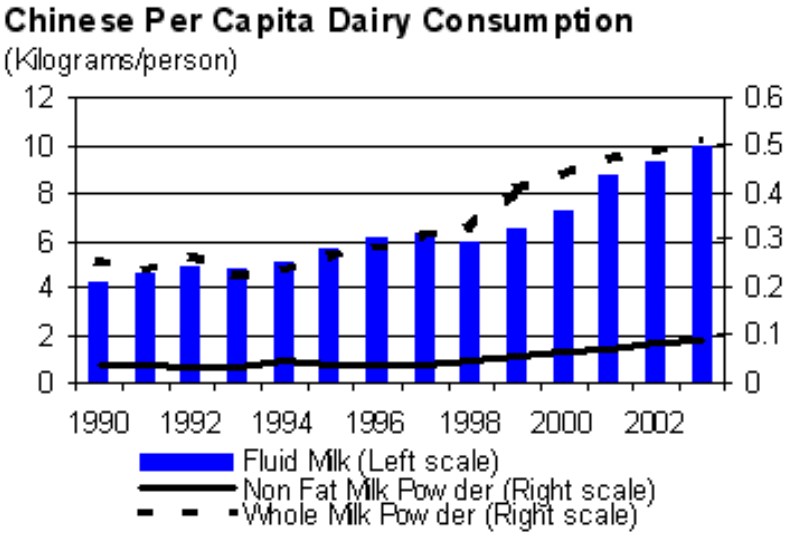
No # 5	Demand Conditions

International Markets – International Demand

Trends:

Opportunities exist to serve international demand. China is one of those markets. China's dairy sector is one that should benefit from strong income growth and its large market size. In recent years, China's per capita consumption of dairy products has grown dramatically, and the country's domestic producers have been unable to keep pace with the growing demand for dairy products.

Over the past decade, China's per capita consumption of fluid milk, non-fat dry milk powder (NFDP), and whole milk powder (WMP) more than doubled.



Source: Baumes (2005) China's Growing Thirst for Dairy, Global Insight

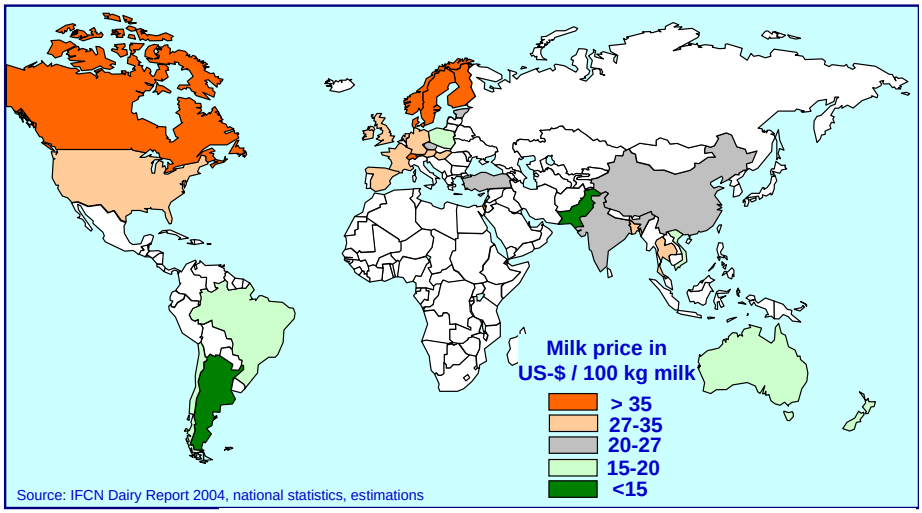
Issues:

- In Europe, globalisation in the food industry has been accompanied by an intensified push to codify and protect geographical distinctiveness in the labelling of regional produce. Moreover, as the current debate over the WTO suggests, the future direction of multilateral trade negotiations is unclear. Hence, while there seems little doubt that in the next two decades the global dairy industry will be transformed, the shape of that transformation, and the roles of stakeholders such as unions and farmers within those transformations, is yet to be determined.

Indicator # 6	Demand Conditions
International Markets – International Milk Prices	

Trends:

Milk prices are generally determined by the situation of demand, supply and the agricultural policy system - EU/US level: The price varied from 28 - 40 US-$ per 100 kg in the EU with the lowest prices in UK and IE and the highest in the Scandinavian countries and Spain. In the USA the price varied from 26 - 30 US-$. Besides the EU/US, this price level was also found in Hungary, Czech Republic, Israel, Bangladesh, Thailand and parts of China.



Source: Hemme.T (2004) International Farm Comparison Network

World market price level: In 2003 a milk price level of 15 - 22 US-$ per 100 kg was received by farmers in Estonia, Poland, Chile, Brazil, India, Vietnam, and Oceania. This price range generally reflects the range of the 'world market price for milk' in recent years.

Below world market price: In Argentina and Pakistan farmers receive very low prices. This means the milk price there is not determined by the world market price for butter/skim milk powder minus average processing costs.

¨ Above EU/US level: The highest milk prices in 2003 were found in Switzerland, Norway and Canada.

Issues:

- The diversity of milk prices between the countries gives a first impression of how national and international trade and market policies are affecting the dairy markets. With WTO negotiations in progress, and more countries signing the agreement on liberalising world dairy markets further, a significant scope for change and shifts in milk production between countries can be expected.

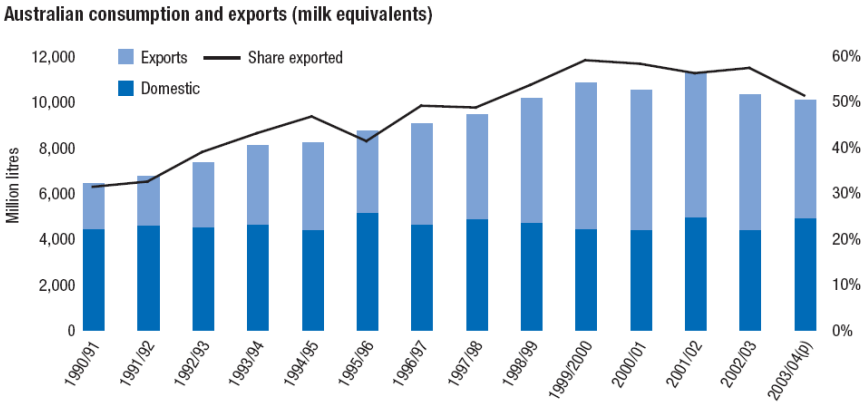
- Milk price comparisons on their own do not allow conclusions about the competitiveness of milk production and shifts of market shares in the future. Therefore, in the next step, the costs of milk production in selected countries are analysed.

Indicator # 7	Section: Demand Conditions

International Markets - Consumption and Exports

Trends:

Over the past two decades, the volume of Australian milk production has expanded at a faster rate than domestic consumption, with an increasing proportion destined for export markets. Australia now exports more than 50% of its annual milk production.



Dairy Australia (2004) *Australian Dairy in Focus, 2004.*

Issues:

- While Australia accounts for only 2% of world milk production, it is a major exporter of dairy products. Australia ranks 3rd in world dairy trade – with 13% of all dairy product exports – behind New Zealand and the European Union (EU 15).
- Australia's export share dropped in 2003/04 for the first time in many years due to the drought-induced shortage of product available for export.
- Japan is an important export market for Australia, accounting for 18% of Australia's exports by value. Australian exports are concentrated in Asia/East Asia – making up 67% of the total value of A$2.4 billion.

Indicator # 8 & 9	Demand Conditions

Trade

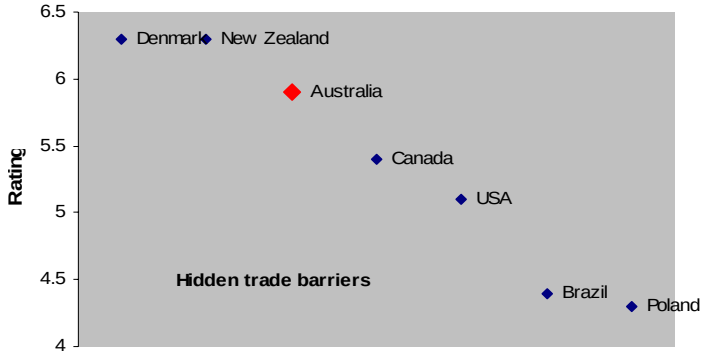
Hidden trade barriers (that is, barriers other than published tariffs and quotas) are (1= am important problem, 7 = not an important problem)?

Results:

Australia ranks 11 of 102. Australia is seen as being relatively free of hidden trade barriers

Issues:

- Australia's high rating and ranking suggests that Australia is an open economy. This openness enhances Australia's competitiveness.



World Economic Forum (2004), Global Competitiveness Report 2003-2004

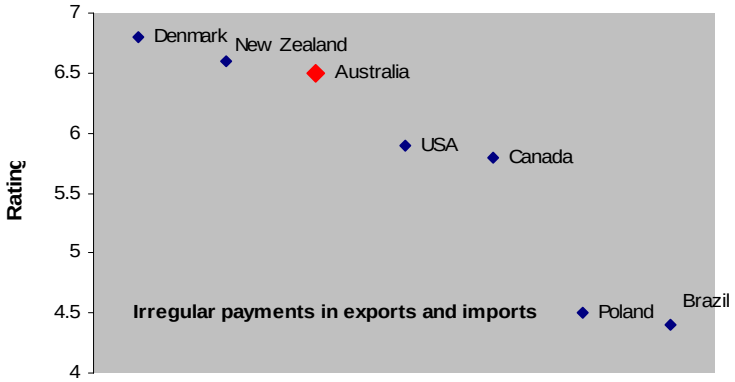
How commonly would you estimate that firms make undocumented extra payments or bribes connected with export and import permits? (1= common, 7 = never occurs)?

Results:

Australia is ranked 7 of 102. Australia is perceived to have transparent and well-regulated exports processes when compared with it's dairy industry competitor nations

Issues:

- Official export processes ensure export competitiveness is maintained, giving Australian industries an export competitive edge

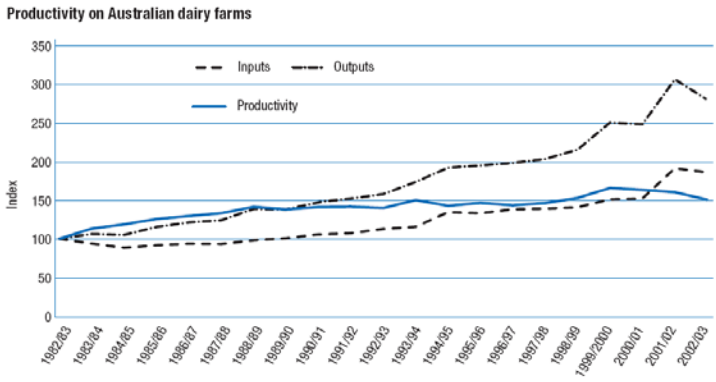


World Economic Forum (2004), Global Competitiveness Report 2003-2004

Indicator # 10	Industry Strategy and Structure
Production Costs and Returns - Farm Productivity	

Trends:

While farm numbers have decreased over the past two decades, milk output has increased, due to increasing cow numbers and improved cow yields. Unfavorable seasonal conditions and the severe and widespread drought of 2002/03 has had a subsequent impact recently.
Nevertheless, the underlying trend to fewer farms, larger herds and increasing levels of production continues.



Dairy Australia (2004) *Australian Dairy in Focus, 2004.*

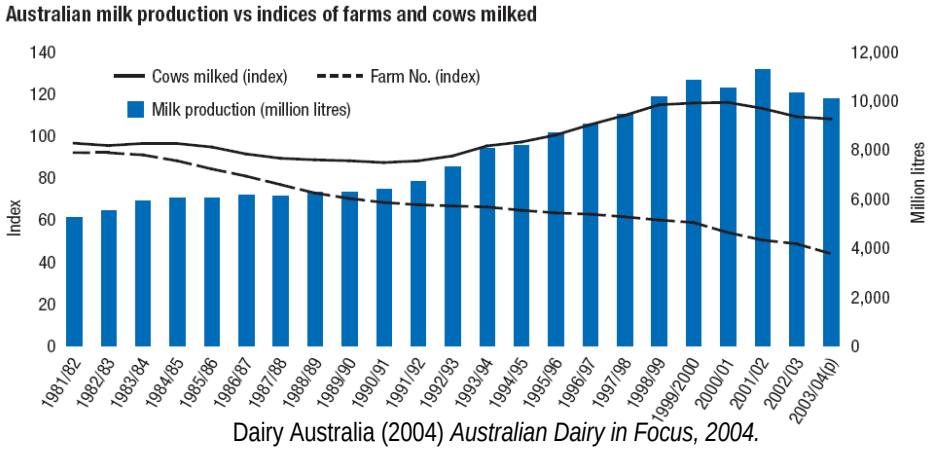
Issues:

- Farmers have made many changes to their general farm management practices and adopted a range of new technologies, including soil testing, fodder conservation, supplementary feeding, improved animal genetics, artificial insemination programs, the use of new milking technology, and the widespread use of computers to record and monitor herd performance.

Indicator # 11	Industry Strategy and Structure
Production Costs and Returns - Milk Production	

Trends:

Dairy farmers have achieved growth in outputs over the decade of 5.9% a year.
However, inputs have increased 4.7% a year - increased feeding of supplementary grains and fodder.
Consequently, the annual rate of increase in dairy farm productivity has averaged just
1.2% a year over the period.



Dairy Australia (2004) *Australian Dairy in Focus, 2004.*

Issues:

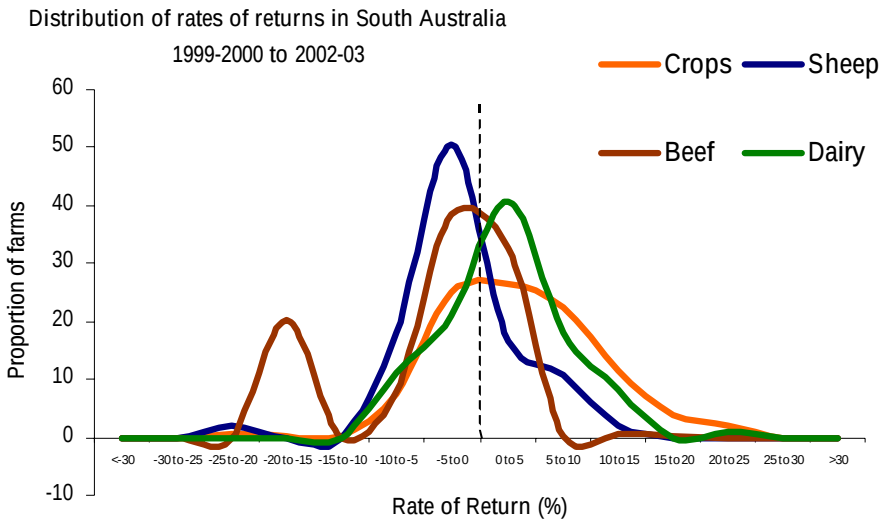
- While the rate of productivity increase has been positive, the industry's terms of trade have declined over the same period. 'Terms of trade' refers to the ratio of prices received by farmers for their products (milk and other farm outputs) to prices paid for inputs (feed, fuel, labour, etc.). It is clear that to maintain farm incomes, productivity growth has to exceed any decline in the terms of trade over any length of time

- However, output prices rose by an average of 0.2% a year, while input prices rose more rapidly at 2.4% a year, largely reflecting increased grain prices.

Indicator # 12	Industry Strategy and Structure
Production Cost and Returns - Rate of Return	

Trends:

The average Rate of Return being received by dairy farmers is higher than that of many other producers in South Australia. However the rate of return is still small and only slightly above the interest rates over that period in time.



Source: ABARE (2004) *Farm Surveys*

Issues:

- Compares with a much narrower range of performance in highly competitive industries. ABARE Farm Survey data compared with 15-year average return on Australian broad-based managed funds (10.7%),
- Why do the poor performers continue to farm? The average SA farming family foregoes $60,000 p.a. in income for the privilege

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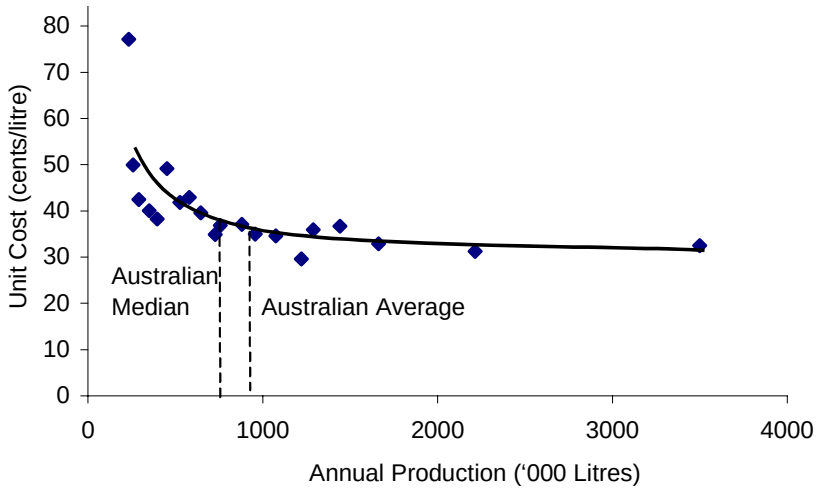
Indicator # 13	Industry Strategy and Structure
Production Costs and Returns - Long Run Average Cost	

Trends:

Many Australian dairy farmers are managing small-scale operations. While there can be significant gains – economies of scale (as the curve illustrates) from operating at larger levels - many smaller farmers are able to minimize costs.



Source: ABARE (2004) *Farm Surveys*

Issues:

- A Long Run Average Cost curve, illustrates the differing cost of extra milk production. Given the shape of Australia's cost curve for dairying - the economies of scale (the decreasing costs as operations become larger - advantages of technologically advanced specialized equipment which would not be cost effective at lower output) decrease as farm size increases.

Indicator # 14	Industry Strategy and Structure
Production Costs and Returns - International Cost of Production	

Trends:

-Within Europe and America, the costs of milk production differ. This means that even without political movements like the ex-tension of the EU or the idea of free trade among North/South America, significant shifts of milk production will occur.
Even within countries, significant cost advantages of larger dairy farms compared to smaller ones were found. On average the small farm costs (Fig. 3) are 21% higher than large farm costs (Fig. 4). This can be seen as an indicator of strong structural change within the countries in the future.

The average sized farms represent the majority of milk producers today. The most competitive countries from this perspective are found in South America, Oceania and Poland (below 17 US-$/100 kg milk). Dairy farms in the USA and Western Europe need more than 30 US-$ per 100 kg milk to cover their full economic costs.

Fig. 4 shows the cost potential in the countries. In Argentina, India and Poland the larger farms analysed can produce milk below 15 US-$ per 100 kg milk.

Fig. 4: Cost of milk production in typical larger size farms

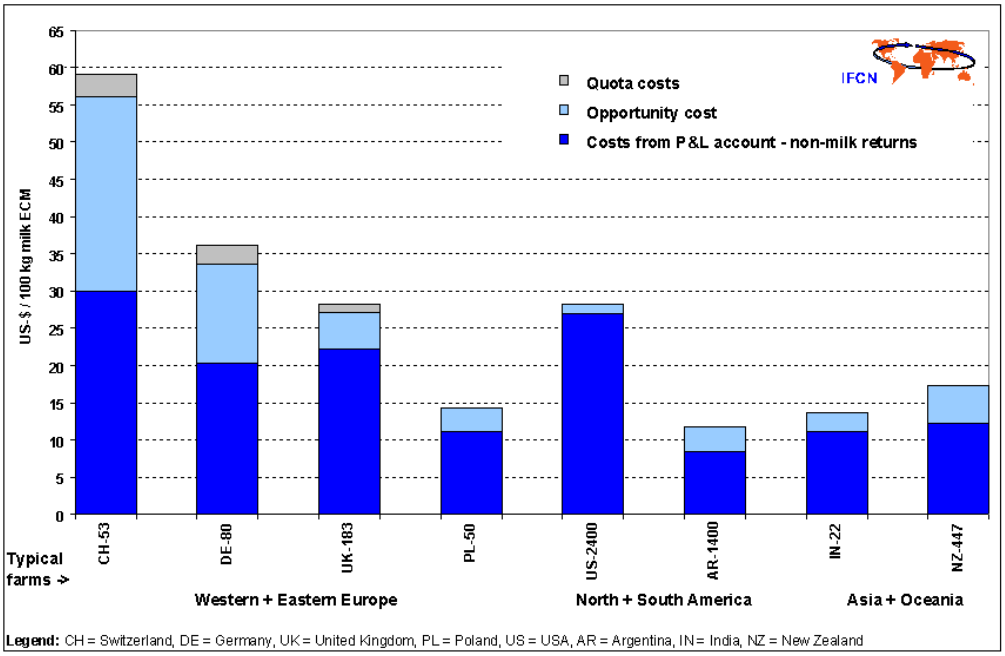
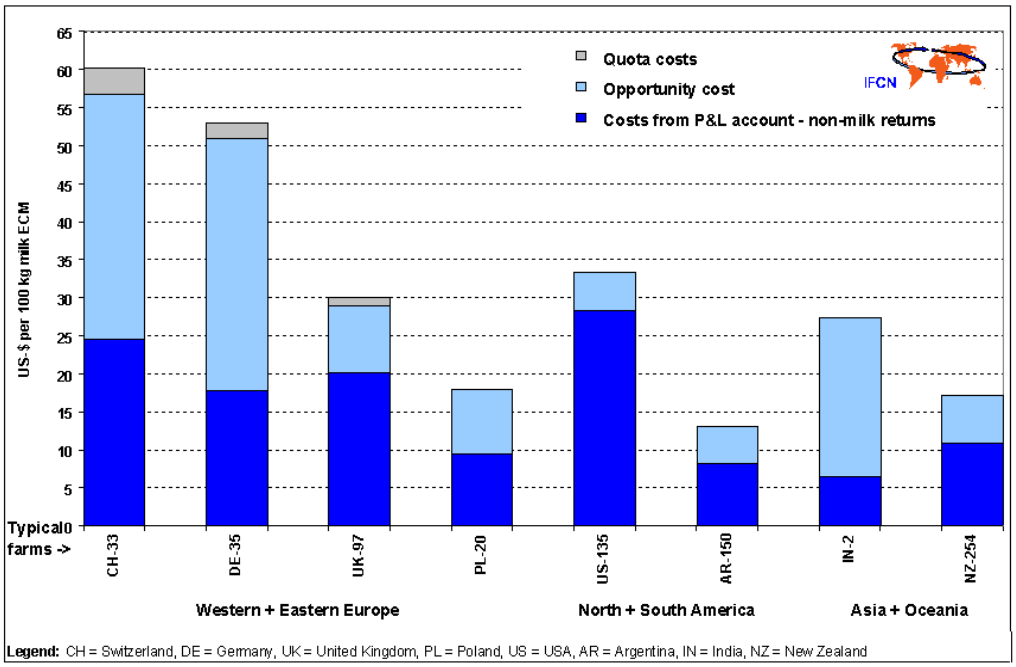


Fig. 3: Cost of milk production in typical smaller size farms



Source: Hemme.T (2004) International Farm Comparison Network

The cost potential in Western Europe: The cost potential in the EU (example UK 183) is around 28 US-$ per 100 kg milk. This is two times higher than the countries mentioned in the point above. The costs in the larger Swiss and German farm are far above 30 US-$ per 100 kg milk.
The case of larger farms in the USA: The very large farm in the USA (2400 cows) has the potential to produce milk for 28 US-$ per 100 kg milk which is comparable with the larger farm in UK.

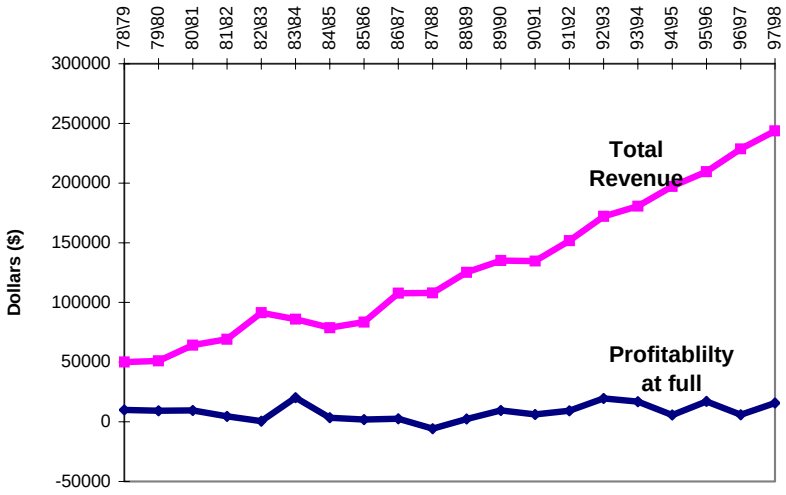
Indicator # 15	Industry Strategy and Structure

Production Costs and Returns- Revenue and Profitability

Trends

- While the rate of productivity increase has been positive, the industry's terms of trade have declined over the same period. 'Terms of trade' refers to the ratio of prices received by farmers for their products (milk and other farm outputs) to prices paid for inputs (feed, fuel, labour, etc.). It is clear that to maintain farm incomes, productivity growth has to exceed any decline in the terms of trade over any length of time

- However, output prices rose by an average of 0.2% a year, while input prices rose more rapidly at 2.4% a year, largely reflecting increased grain prices.



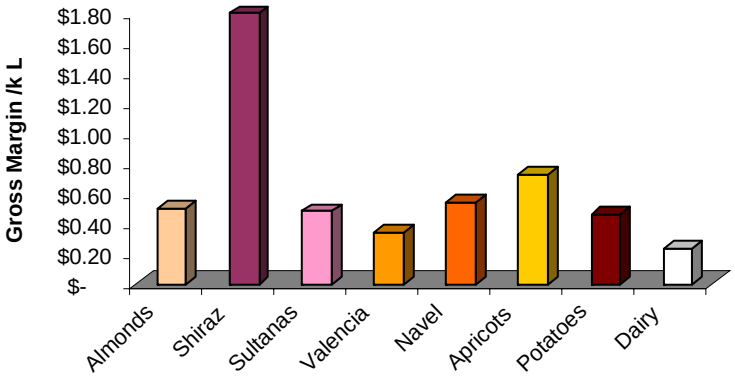
Food ScoreCard (2002), South Australian FoodScoreCard

Indicator # 16	Industry Strategy and Structure

Production Costs and Returns - Gross Margins

Trends:

The gross margin achieved in relation to the amount of water used can depend on amount of water used to grow a commodity, water use efficiency as well as the viability of the commodity grown. The graph shows that Shiraz wine grapes out performs other commodities shown, with dairy being the worst performance within this group using this measure.



Food ScoreCard (2002), South Australian FoodScoreCard

Issues:

- As dairy production is extremely dependant on water for the irrigation of pastures, there is a concern for the dairy industry in this area. As well as being detrimental to the current Triple Bottom Line of the industry , it also puts it under long term threat from other industries that show higher returns for their use of water.

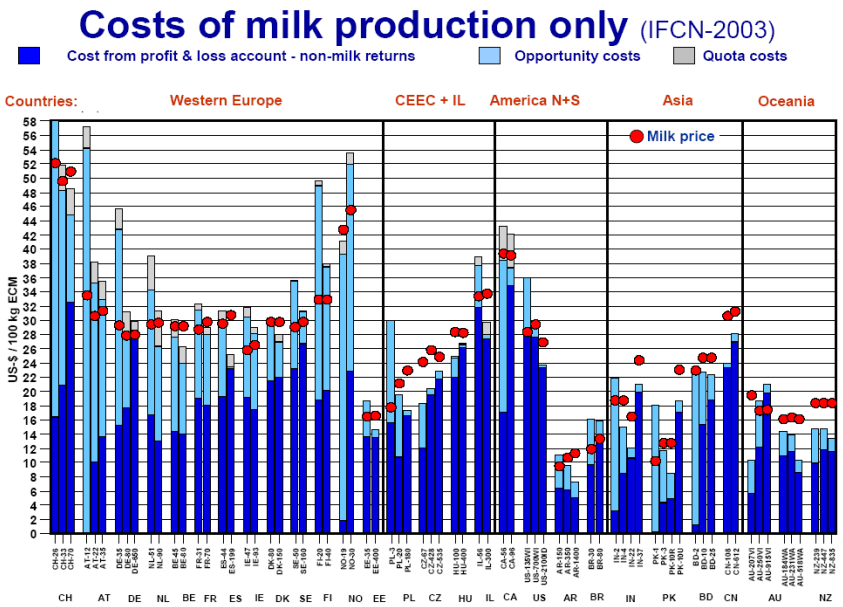
Indicator # 17	Industry Strategy and Structure

Production Costs and Returns - Cost of Milk Production

Trends:

South America and Oceana have lowest costs of production. West European costs of production are the highest including very high opportunity cost of using high value land for dairying.

Milk prices show that South Americas, and Oceana milk producer are receiving the lowest lower milk prices for milk produced.



Source: Shadbolt () *What Makes Grazing Systems Competitive*

Issues:

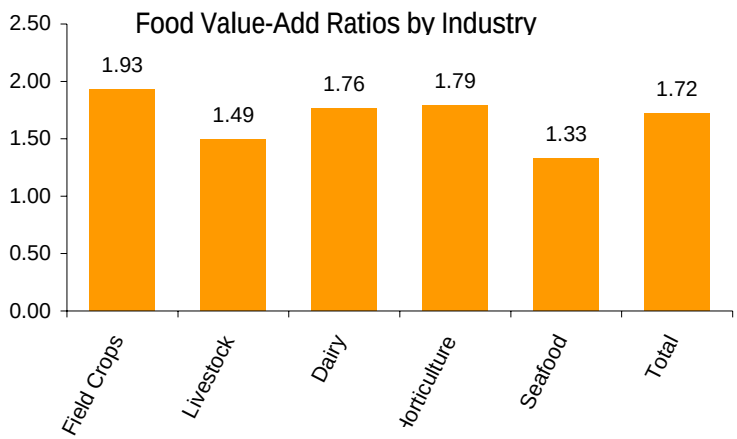
- Australian and New Zealand are 2 of the world most competitive producers of dairy products along with some South American countries - namely Argentina and Briazil. They are the lowest cost producers and therefore are very competitive in production economics and management.

Indicator # 18	Industry Strategy and Structure

Value-Add – Food value Add

Trends:

Value-add ratios represent the price differential of a product as it goes from the farm-gate to wholesale. The higher the ratio, the more significant the elaborate manufacturing/ transformation or packaging and branding that occurs. Seafood ratios are relatively small by way of comparison, as a result of consumer preference towards fresh (and often live) product. Dairy value-add ratios reflect the diversity of products, with modest price growth in milk, and larger price differentials in cheeses and yoghurts.



Source: SA Food ScoreCard

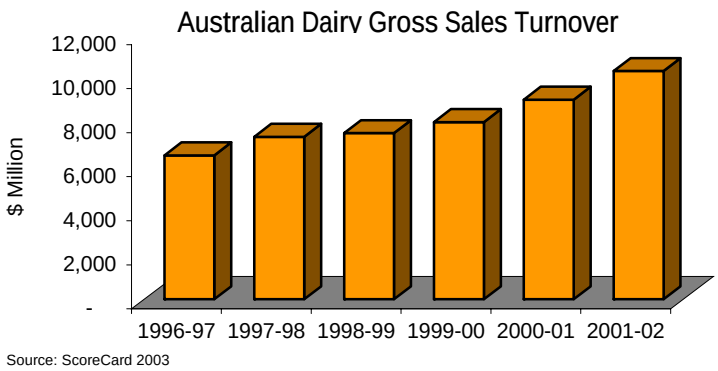
Issues:

- While dairy products represent above average value-add ratios, considerable opportunities exist to improve the value-added potential of markets. Examples of the opportunities both in product diffentiation, packaging and marketing are highlighted by the emergence of milk products such as, organic, biodynamic, low fat and A2 beta-caseins milk along with specialty cheeses and yoghurt.

Indicator # 19	Industry Strategy and Structure
Business Environment - Gross Sales Turnover	

Trends:

Dairy Gross Sales Turnover includes all retail, hospitality and tourism as well as export sales of dairy products over any one year. Growth in sales over the last decade (up by x% per annum) reflect both increased consumption, inflation (prices are in nominal terms) as well as new products.



Source: SA Food ScoreCard

Issues:

- In more recent times, demand for food products have increased relative to incomes, reflecting both expanding consumer diversity and tastes, convenience packaged and presented foods, and health attributes. Growth in dairy sales turnover is on average higher/lower than the average for all foods in Australia.

Indicator # 20	Industry Strategy and Structure
Business Environment – Business Reform	

Trends:

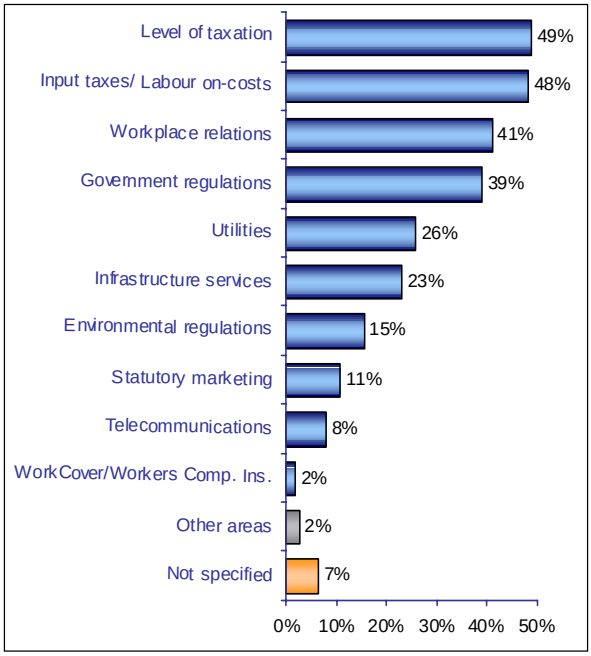
49% of manufacturers indicate the level of taxation and 48% indicate input taxes/ labour on-costs to be the general business areas in which reforms would most improve their organisation's competitiveness

Details:

- 41% indicated that reforms to workplace relations would improve competitiveness, while;
- 39% indicated that reforms to government regulations would improve competitiveness;
- 26% indicated utilities and 23% named infrastructure services;
- 15% indicated environmental regulations;
- A further 11% indicated statutory marketing, and;
- 8% named telecommunications.

"Other" areas mentioned (single) included: "Payroll tax", "Investment to automate", "HACCP being enforced."

General business reforms to improve competitiveness



Source: National Food Industry Strategy (2003), Key Data Survey of Food and Beverage Manufacturers.

Indicator # 21	Industry Strategy and Structure

Business Environment – Government Export Assistance

Trends:

Manufacturers believe the priorities of Commonwealth Government agencies assisting exporters should be government & market access issues (46%), highlighting specific opportunities (45%), and market research (43%).

Details:

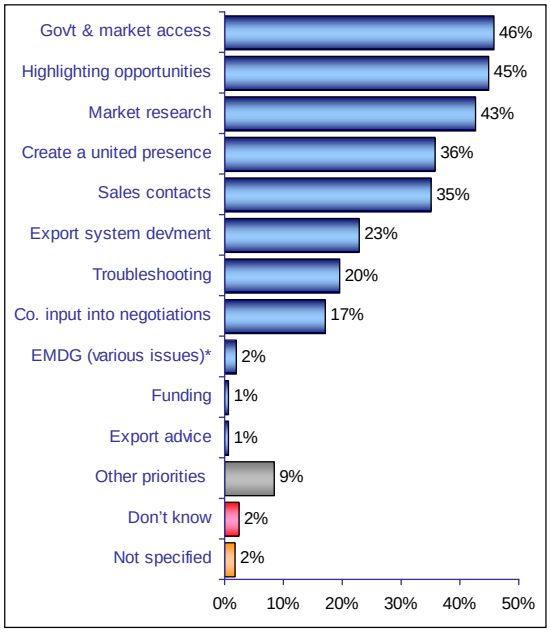
Furthermore:

- 36% of manufacturers indicated creating a united Australian presence;
- 35% indicated sales contacts;
- 23% indicated company export system development;
- 20% stated troubleshooting;
- 17% stated company input into international trade negotiations;

Other priorities (single responses) included: "Small exporters", "Consistency in regulations", "Look at export subsidies", "less red tape", "No Austrade fees."

- Further analysis reveals a higher incidence of: Highlighting opportunities responses amongst organisations with <$200 staff/<$50 Mill sales. Sales contacts amongst those with an overseas head office.

Government agency priorities for exporters



Source: National Food Industry Strategy (2003), Key Data Survey of Food and Beverage Manufacturers.

Indicator # 22	Industry Strategy and Structure

Business Environment – Environmental Management Systems

Trends:

32% of manufactures indicated the benefit of an environmental management system is to provide continued market access or access to new markets. 14% mentioned reduced cost of production. 40% of manufacturers indicated the benefits were to ease regulatory pressure.

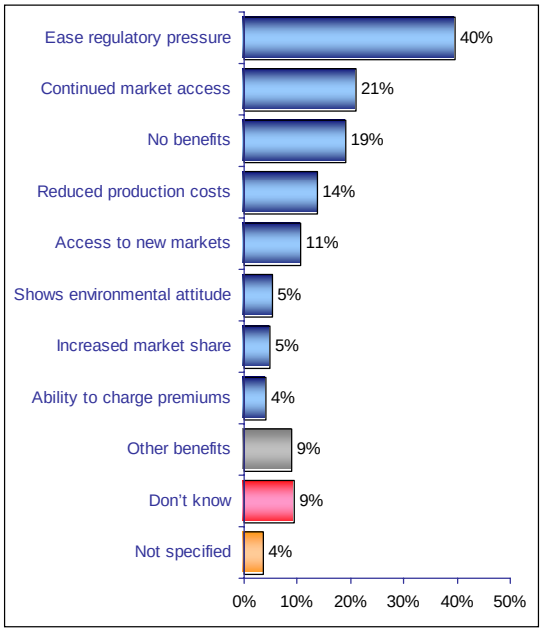
Details:

More specifically:

- 21% mentioned continued market access and 11% mentioned access to new markets.
- 19% indicated no benefits (and no other issues);
- 5% of manufacturers indicated displays our environmental attitude to our staff and the community, 5% stated increased market share and 4% stated the ability to charge price premiums.

Further Analysis Reveals: Manufacturers who indicated easing regulatory pressure are more likely to have: >200 staff, no overseas head office, a metro location, and >$20Mill in annual sales.

Benefits of environmental management systems



Source: National Food Industry Strategy (2003), Key Data Survey of Food and Beverage Manufacturers.

Indicator # 23, 24 & 25	Industry Structure and Strategy

Government - Intervention

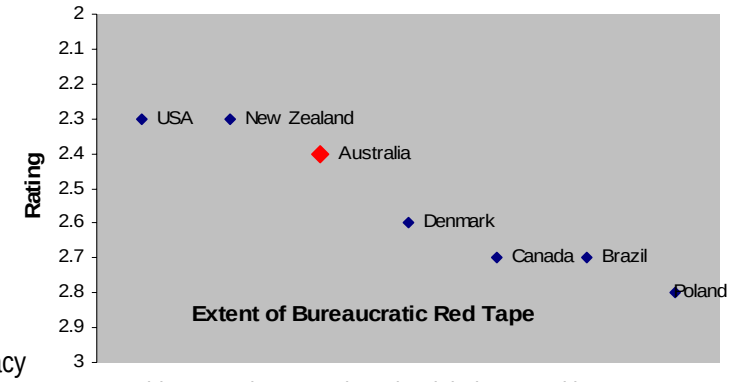
How much management time is spent dealing/negotiating with government officials (as a % of work time)? (1 = 0%, 2 = 1 – 10%, 3 = 11-20%, 8 = 81 – 100%)

Results:

Australia ranks 25 of 102. Australia is being perceived as having relatively low levels of time industry mangers have to spend dealing with applications.

Issues:

- The relative efficiencies of government bureaucracy can be considered a competitive advantage.



World Economic Forum (2004), Global Competitiveness Report 2003-2004

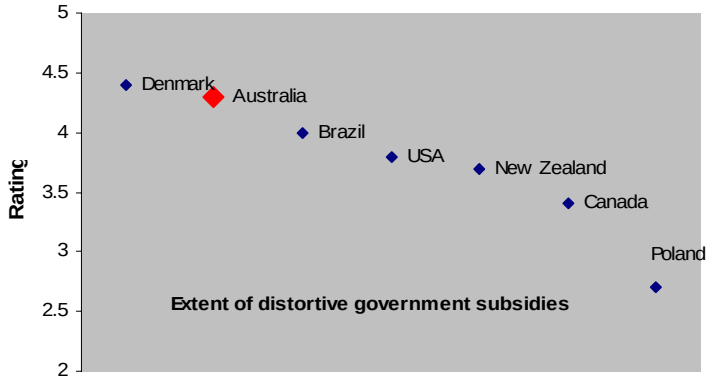
Government subsidies are (1= keep uncompetitive industries alive artificially, 7 = improve productivity of industries)?

Results:

Australia ranks 9 of the 102. Australia is perceived as having subsidies designed to improve the productivity of industries

Issues:

- Although a generalised observation, Australia's competitive position in relation to the primary industries sector and dairy in particular maybe strong when compared with European and North American industries



World Economic Forum (2004), Global Competitiveness Report 2003-2004

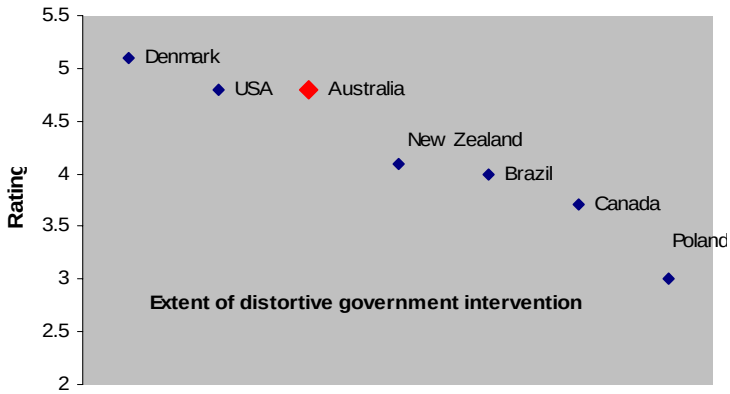
The impact of government intervention on fair competition is (1= distorting, 7 = not distorting)?

Results:

Australia ranks 7 out of 102. Australia is perceives as having a relatively low level of distorting in government regulation.

Issues:

- Australia's high ranking in relation to government intervention can probably be attributed to the reforms precipitated by the last decade of National Competition Policy.



World Economic Forum (2004), Global Competitiveness Report 2003-2004

Indicator # 26, 27 & 28	Industry Structure and Strategy

Government - Policy

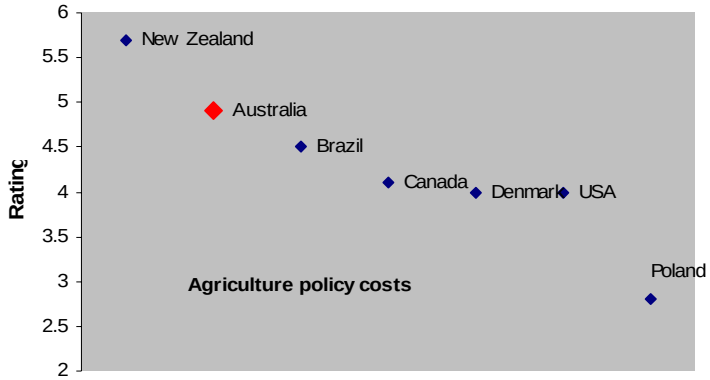
The cost of agriculture policy is (1= excessively burdensome, 7 = balances all economic agent's interests)?

Results:

Australia is ranked 5 of 102. Australia is perceived as having an agricultural policy that is better at balancing all economic agent's interest than most of it's competitors.

Issues:

- Although Australia ranks well, it's rating is well behind one of it's major competitors, New Zealand. In comparison to New Zealand it's agricultural policies are seen as more burdensome.



World Economic Forum (2004), Global Competitiveness Report 2003-2004

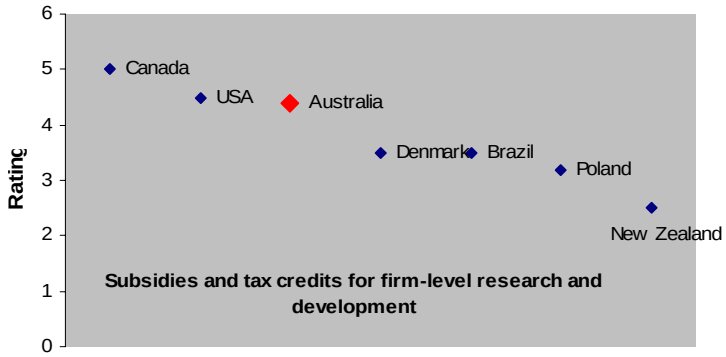
For firms conducting research and development, direct government subsidies to individual companies or R&D tax credits (1= never occur, 7 = are widespread and large)?

Results:

Australia is ranks 13 of the 102. Australia is perceived as having a supportive incentive for firms and industries to invest in R&D.

Issues:

- Maintaining high levels of investment in R&D will lead to innovation in productivity and processes clearly adding to Australia's long term competitiveness



World Economic Forum (2004), Global Competitiveness Report 2003-2004

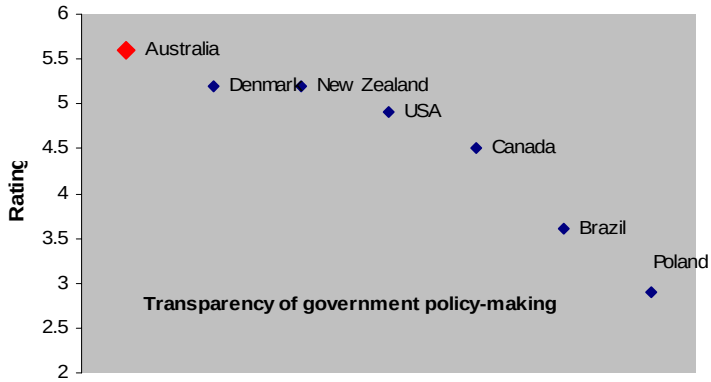
Firms are usually informed clearly and transparently by the government on changes in policies and regulations affecting industry (1= never informed, 7 = always clearly and fully informed)?

Results:

Australia is ranked 2 of 102. Australia is perceived as having the highest level of transparency of government policy making, surpassing that of it's dairy industry competitor nations

Issues:

- Transparency in government policy making assist industry and firms when there are making investment decisions



World Economic Forum (2004), Global Competitiveness Report 2003-2004

Indicator # 29, 30 & 31	Industry Structure and Strategy

Government - Environmental Regulation

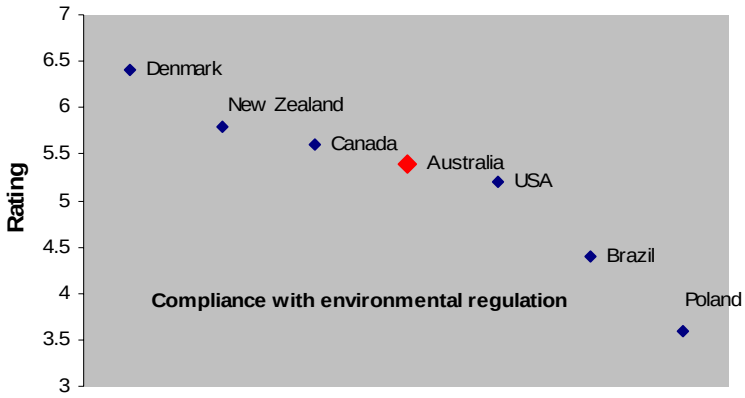
Your country normally enacts environmental legislation (1= much later than other countries, 7 = ahead of most other countries)

Results:

Australia ranks 14 from the 102. Australia is perceived to enact environmental regulations ahead of some of it's key dairy industry competitors but behind European competitors.

Issues:

- Consumers are increasing valuing environmental sustainability. Enacting and complying with environmental standards can provide a competitive advantage in the eyes of consumers, especially European consumers.



World Economic Forum (2004), Global Competitiveness Report 2003-2004

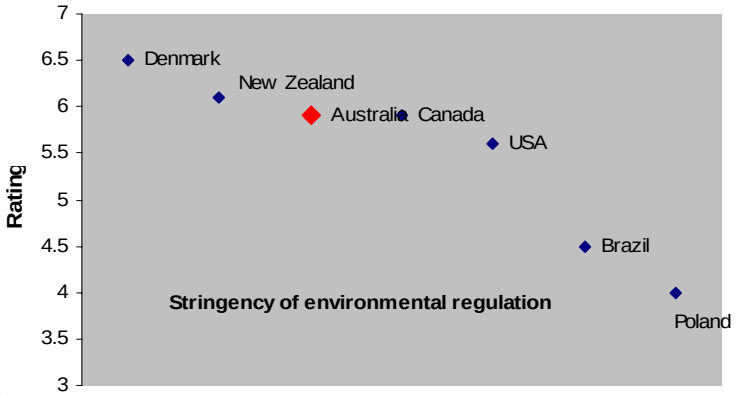
How stringent in environmental legislation? (1 = lax compared with that of most countries, 7 = among the world's most stringent)

Results:

Australia ranks 14 from 102. Australia is perceived as having stringent environmental regulations ahead of some of its key dairy industry competitors but not as stringent as many European competitors.

Issues:

- The stringency of environmental regulations can assist in access to 'discerning' markets. The level of stringency can therefore assist in accessing markets ad be a competitive advantage. Cost of compliance can undermine these advantages



World Economic Forum (2004), Global Competitiveness Report 2003-2004

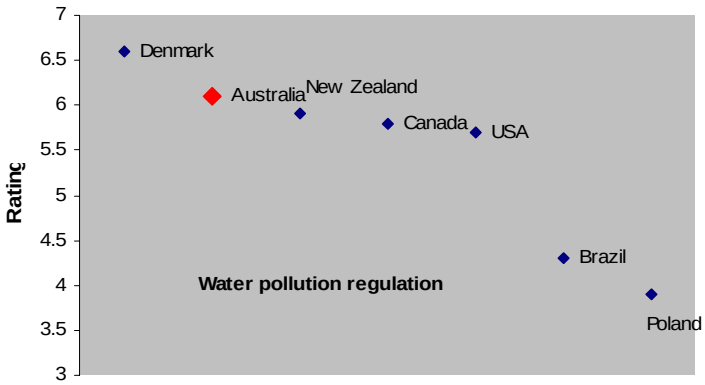
Water pollution regulations are (1= lax compared with those of most other countries, 7 = among the world's most stringent)

Results:

Australia ranks 11 of the 102. Australia is perceived as having stringent water pollution regulations compared to most of it's dairy industry competitors.

Issues:

- Stringent water pollution regulation can assist in addressing industry sustainability ad therefore provide a competitive advantage where this market is concerned. It has the potential in the short-term to undermining cost competitiveness



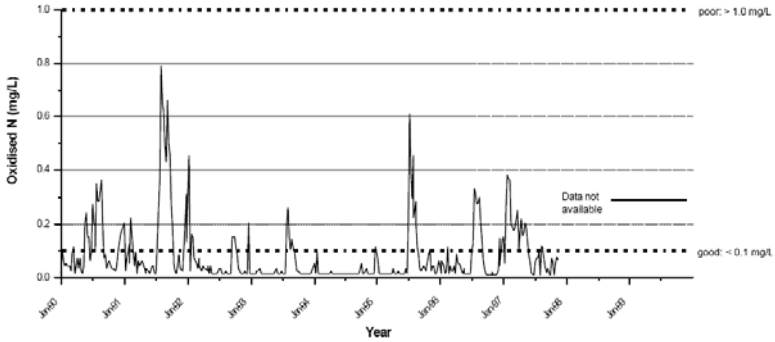
World Economic Forum (2004), Global Competitiveness Report 2003-2004

Indicator # 32	Factor Conditions
Water Quality - Nitrogen Levels	

Trends:

Nitrogen is revealed into the River Murray systems as a externality result of farming practices, particularly in the lower river swamp regions. Improved farm management has resulted in lower net emissions over time, however, this has been mitigated by lower average water flows along the Murray resulting in continued show high nitrogen samples parts per million.

Murray River Swamps, Total Kjedahl



EPA SA (2002), Ambient Water Quality Monitoring of the River Murray 1990 – 1999, Report No 1

Issues:

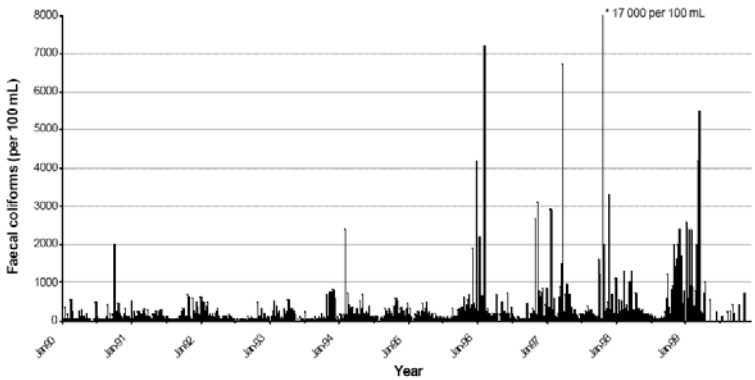
- High nitrate concentrations in water are associated with intensive agriculture and to a lesser extent to sewage discharges. The actual risk to human health posed by current levels of nitrate appears to be very small.
- The most important effect of deposited nitrogen on the flora and fauna of fresh waters is caused through acidification and mobilisation of aluminium. Although it is difficult to disentangle the contributions of deposited sulphur and nitrogen to acidification, there is no doubt that nitrogen has contributed significantly to changes in the biota. Within salty water, nitrogen eutrophication can lead to the excessive growth of organisms (algae blooms.)

Indicator # 33	Factor Conditions
Water Quality – Faecal Contamination	

Trends:

Faecal contamination of the lower river Murray swamps occurs as a result of farm management practices, particularly associated with 'flood irrigation' style dairy farming. The microbiological quality of drinking water is monitored by testing for two classes of indicator organisms, thermotolerant coliform and total coliform .bacteria. Lower river murray tests for E-Coli suggest that contamination remains a serious and growing threat to safe drinking water and recreational activities.

Murray River Swamps, Faecal Contamination Levels (E-Coli)



EPA SA (2002), Ambient Water Quality Monitoring of the River Murray 1990 – 1999, Report No 1

Issues:

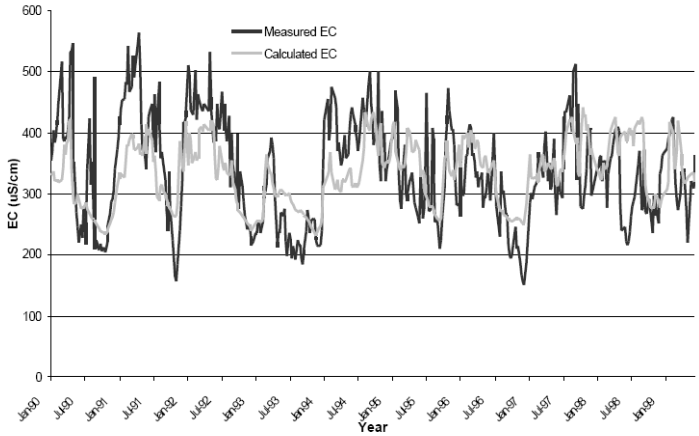
- The safety of available drinking water and any possible risks to health involved in the consumption of that water.
- Despite awareness and improved farm management practices, lower water flows in the river Murray has resulted in elevated E-Coli counts per 100ml of water, particularly over the later half of the 1990s.

Indicator # 34	Factor Conditions
Water Quality - Salinity Levels	

Trends:

Salinity levels in the river Murray vary considerably as a result of seasonal variations and water flows. Generally, improved management through salt interception schemes, and water flow management have lessened the spike in EC levels over the later half of the last decade.

Murray River Swamps, Salinity Levels (FC) 1990-1999



EPA SA (2002), Ambient Water Quality Monitoring of the River Murray 1990 – 1999, Report No 1

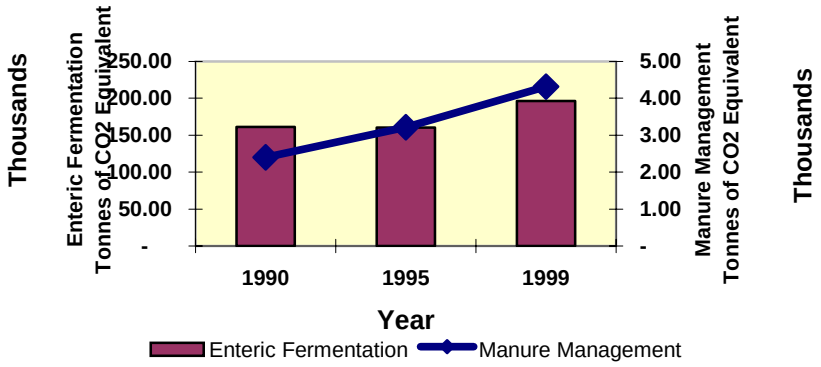
Issues:

- Salinity remains a significant issue for the river Murray system, where relatively high salt loads limit the horticultural opportunities available for the water in the lower river Murray areas.

Indicator # 35	Factor Conditions
Sustainable Farming Practices - Direct and In-Direct biosphere Emissions	

Trends:

The release of 'greenhouse gases' within agricultural consist principally of methane from enteric fermentation by livestock, nitrous oxide from agricultural soils & fertiliser use. Emissions are directly related to the number of cows, where expansion in dairy capacity over the last decade has seen increasing emissions. It is estimated that the dairy sector contributes around 2% of total CO2-e emissions in South Australia.



Source: SA Food ScoreCard

Issues:

- CSIRO scientists have indicated that projected emissions of greenhouse gases from human activities are likely to result in the climate changes in SA. Climate change in SA would effect agriculture in the following ways: reductions in yields; additional soil erosion; higher evaporation (irrigation); additional exposure to pests.

No # 36	Factor Conditions
Sustainable Farming Practices – Assessment Tool	

Trends:

Figure 1a illustrates the results of the sustainability assessment for a typical Ontario dairy operation surveyed 2. The polygon on the left exemplifies the current situation; whereas the polygon on the right depicts the operation after corrective measures would have been applied.
The energy indicator displays a positive indication, although the dairy sector does require a large amount of energy (nuclear power and fossil fuels) for milking and cropping but the land base is sufficient to satisfy the program. The water indicator received an extremely high degree of sustainability due primarily to the fact that the water drawn for Ontario operations originates from self-generating ground wells located on the farms. The Water indicator so far measures water availability. Results might change once corrections are applied to further consider water quality.

Figure 1a – Actual Situation

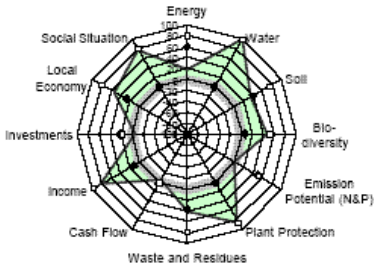


Figure 1b – Optimized Situation

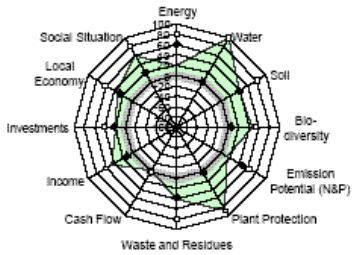


Figure 2: Expansion Oriented Farm

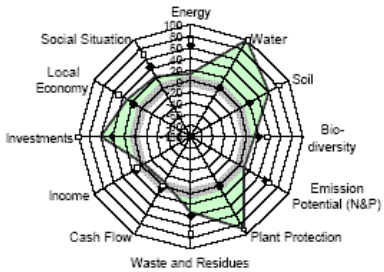
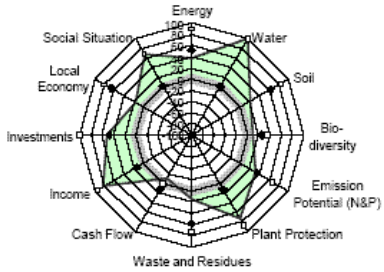


Figure 3: Established Farm



Source: Swiss College of Agriculture; 2 Nestlé Canada; research completed as part of the MBA in Agribusiness at the University of Guelph, Introduction of the Sustainability Assessment Tool RISE into Canadian Agriculture

The soil indicator typically illustrated a high level of sustainability. This positive measure can be attributed to regular soil analysis by most farmers, relatively neutral pH levels, and limited erosion and wetness on farms through out South-western Ontario. Additionally, many farm managers will tile drain fields that have experienced wetness in the past. Each dairy farm surveyed showed positive plant protection and waste & residues indicators. These very optimistic results can be attributed to proper waste management and the limited usage of plant protection products (primarily herbicides). It has to be emphasised though that the model so far does not integrate resistance achieved by means of genetic modification and its inherent risks.

Many Ontario farms displayed poor emission potential (nitrates and phosphates). This problem can be attributed to insufficient storage facilities (many lacking liquid manure storage at all), with the potential for leakage or seepage into the surrounding soil. The above dairy operation has been improved by investing $15,000 into a new liquid/solid manure storage facility, resulting in a drastic emission potential improvement, which can be seen in Figure 1b..

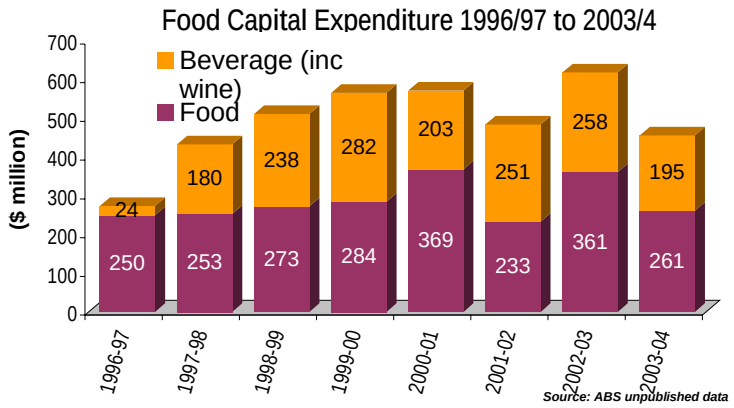
The economic indicators may be the most inconsistent when measured across the participating dairy operations. The farm depicted in Figure I has a relatively low cash flow indicator. Due to the capital intensiveness of the dairy industry (value of land and milk quota) and accounting practices accepted throughout the Canadian agricultural sector, it appears to be very difficult to display a positive Cash Flow indicator. Optimizing this particular indicator proved very difficult due to the aforementioned reasons. The remaining economic indicators (Income and Investment) appear to be somewhat dependent on where the participant is in their business cycle. Many young and expansion-oriented farmers appear to have low Income indicators but relatively high values on the Investment measure (refer to Figure 2). The opposite can be observed on established farms or where the owner is about to retire (refer to Figure 3), where the Investment indicator is low and the Income indicator is comparatively high. The Local Economy and Social Situation indicators appear for the most part to be in the sustainable region of the polygon throughout the dairy industry, resulting from excellent provincially initiated social programs (OHIP, education, work safety).

Indicator # 37	Factor Conditions

Food Capital Expenditure

Trends:

Trends in private new capital expenditure for the food-manufacturing sector generally mirror economic demand (domestic) for product. The substantial expansion in capital expenditure for the SA wine industries over the last decade contrasts with relatively stable (between $250m and $300m) expenditure for other foods (including dairy).



Source: ABS unpublished data

Issues:

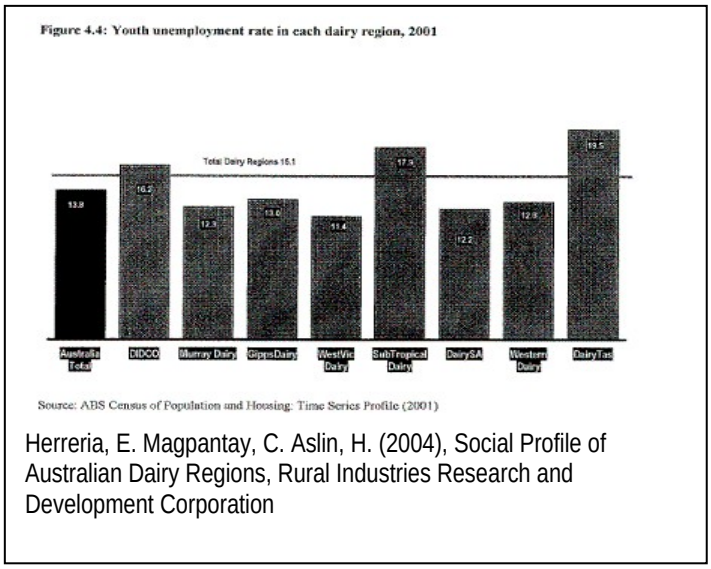
- Growth in the overall trends in private new capital expenditure for food manufacture in SA have been modest over the last decade, consistent with growth in food consumption, and the expansion of the wine sector. Declines are evident over recent times, a consequence of a rising $A and resulting falls in demand for Australian food exports.

Indicator # 38	Factor Conditions

Labour Quality and Availability - Unemployment Rate

Trends:

In 2001, the unemployment rate across the regions stood at 8%. This is marginally above the unemployment rate across Australia as a whole (7.4%). Three of the eight dairy regions had rates above the overall Australian rate (DIDCO, Sub Tropical Dairy, and DairyTas). DairyTas, in particular, had a relatively high unemployment rate of 11.0%, reflecting stagnant economic conditions in Tasmania and lack of growth in job opportunities (see Figure 4.3). This relatively high unemployment rate occurred despite the fact that, as Figure 4.2 (above) shows, there was no increase in the working age population in the DiaryTas region over the period 1996-2001. By contrast, the unemployment rate was relatively low in other dairy regions



Herreria, E. Magpantay, C. Aslin, H. (2004), Social Profile of Australian Dairy Regions, Rural Industries Research and Development Corporation

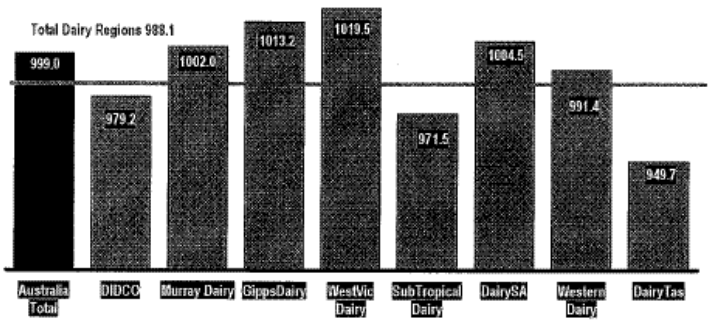
No # 39	Factor Conditions

Labour Quality and Availability - Index of Relative Socio-Economic Disadvantage

Trends:

The 2001 Socio-Economic Indexes for Areas (2001 SEIFA) Developed by ABS is composed of four indexes (see Glossary), each of them covering different aspects of the socio-economic situation in an area. For this report, the index of Relative Soci-Economic Disadvantage has been selected as the most appropriate index to analyse socio-economic disadvantage in the dairy regions.

Figure 6.1: Index of Relative Socio-Economic Disadvantage (SEIFA) for each dairy region, 2001



Source: ABS Socio-Economic Indexes for Areas (2001)

Herreria, E. Magpantay, C. Aslin, H. (2004), Social Profile of Australian Dairy Regions, Rural Industries Research and Development Corporation

The index is a composite of several variables derived from the 2001 Census of population and housing, including family income, unemployment levels, education qualifications, households renting from a government authority, and l0ow – skilled occupations

At the SLA level, the Australian average value has been standardised by ABS at a mean of 999 (the Australian average calculated by ABS comprises all SLA in Australia. ABS Socio-Economic Indexes for Areas 2003), and relatively disadvantaged areas have values below this score, while relatively advantaged ones have values above 999. Low scores tend to indicate lower than average family incomes, above average unemployment, lower educational attainments, more public housing rentals, and higher percentages of the workforce in low-skilled occupations; or a combination of these factors producing low scores.

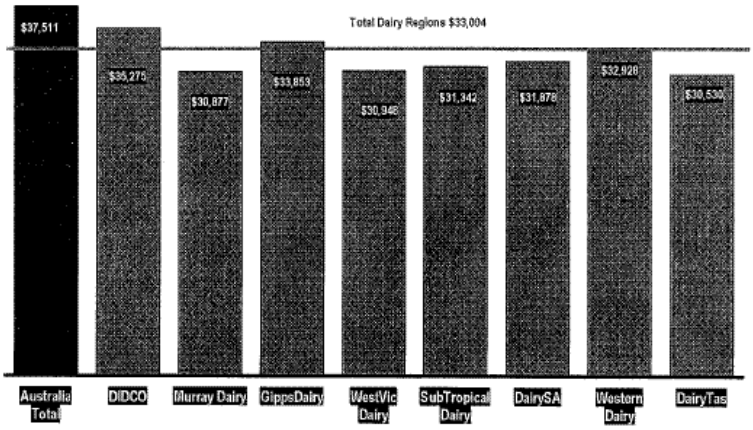
The Index of Relative Socio-Economic Disadvantage for the dairy regions at the SLA level was 988.1, indicating that dairy regions overall are relatively disadvantaged in comparison with Australia as a whole. Index scores ranged from a high of 1,019.5 in the WestVic Dairy to a low of 949.7 in DairyTas (see Figure 6.1) should be noted that four dairy regions had scores above 1,000 (Murray Dairy, GippsDairy, WestVic Dairy and DairySA), suggesting that populations in these regions are faring better that many regional communities in non-dairying regions. The contribution of a profitable dairy industry, particularly in the Victorian regions, may have contributed to the above average index scores in these

No # 40	Factor Conditions
Labour Quality and Availability - Taxable income	

Trends:

This variable refers to stated taxable income for the 1999-2000 financial year, based on personal income tax returns lodged with the ATO. Caution must be applied in interpreting theses figures, as incomes of people with different kinds of occupations may be difficult to compare. For example, farmers may produce some of their own food and not have to pay for it from cash income.

Figure 5.1: Mean annual personal taxable income for the 1999–2000 financial year in each dairy region



Source: ATO Taxation Statistics (1999–2000)

Herreria, E. Magpantay, C. Aslin, H. (2004), Social Profile of Australian Dairy Regions, Rural Industries Research and Development Corporation

It also needs to be remembered that there are substantial numbers of people, particularly retirees and social welfare recipients, who do not lodge tax returns with metropolitan areas and urban-based occupations, although people in some mining areas also have high taxable incomes.

For the dairy regions, mean annual personal incomes were slightly below the Australian average at $33, 0004 as compared with $37, 511 (see figure 5.1). The range was from a low of $30,530 in the DairyTas region to a high of $37,275 in the DIDCO region. As for several other variables considered in this report, this suggests a degree of socio-economic disadvantage in Tasmania as compared with mainland Australia.

Indicator # 41	Factor Conditions

Bio-security – Impediment and Implementation of systems

Trends:

28% of manufacturers believe there are impediments for maintaining food safety, while 25% believe there are impediments for quality systems in Australia

Details:

Among these manufacturers:

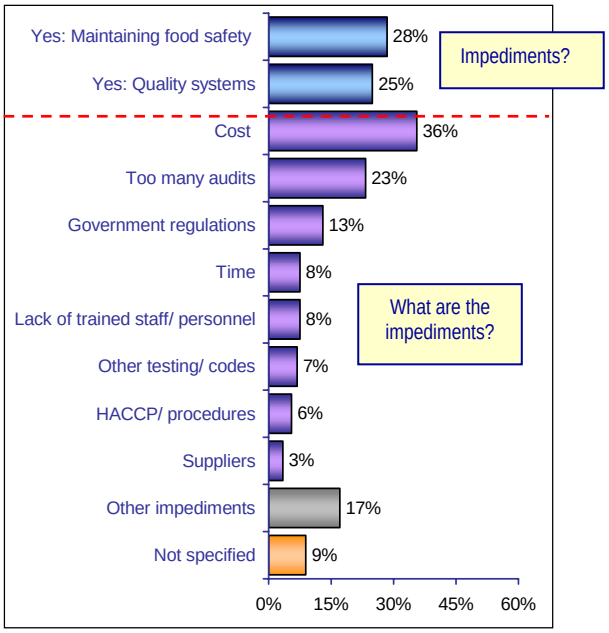
- 36% mentioned cost, while;
- 23% stated too many/multiple audits/inspections/ specifications/no national approach, and;
- 13% stated government regulations/legislation;

A further 8% stated time, 8% stated lack of trained staff/ personnel, 7% stated other testing/codes/systems (EU, ANZFA, etc), 6% stated HACCP/HACCP procedures, and 3% stated suppliers/ supplier regulations/supplier understanding;

- Other impediments (single mentions) included: "taxation", "lack of information", "agricultural reality", "access to training."

Further analysis reveals: A higher incidence of "impediments for maintaining food safety" amongst manufacturers in SA and those with 501+ staff.

Food safety/quality systems impediments



Source: National Food Industry Strategy (2003), Key Data Survey of Food and Beverage Manufacturers.

Indicator # 42	Factor Conditions

Infrastructure – Quality of Infrastructure

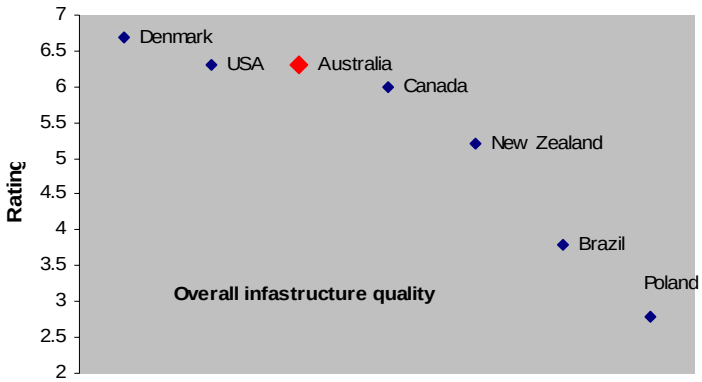
General infrastructure (1= poorly developed and inefficient, 7 = among the best in the world)?

Results:

Australia is ranks 9 of 102. Australia is perceived as having among the world's best infrastructure in the world and ranks well among it's dairy industry competitor nations.

Issues:

- Well developed and efficient infrastructure reduces costs to industry and underpins competitive advantage.



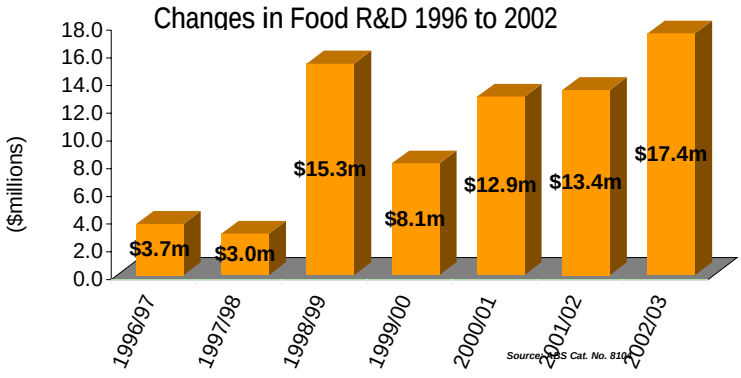
World Economic Forum (2004), Global Competitiveness Report 2003-2004

Indicator # 43	Related and Supporting Industries

Research & Development – Changes in Expenditure

Trends:

Despite the volatility of the data, an upward trend is evident over recent times, with research and development (R&D) expenditure in food manufacturing increasing almost 5 fold from $3.7 million in 1996/97 to $17.4 million in 2002/03.



Source: ABS unpublished data

Issues:

- Although an upward trend in private R&D expenditure has occurred over more recent times, this has risen from a small base and is dwarfed by total public based R&D expenditure (mostly focussed at the primary or agriculture sector).
- Private R&D expenditure at almost $20m represents less than half a percent of food manufacturing turnover.

Indicator # 44	Related and Supporting Industries

Research & Development – Programs Implemented

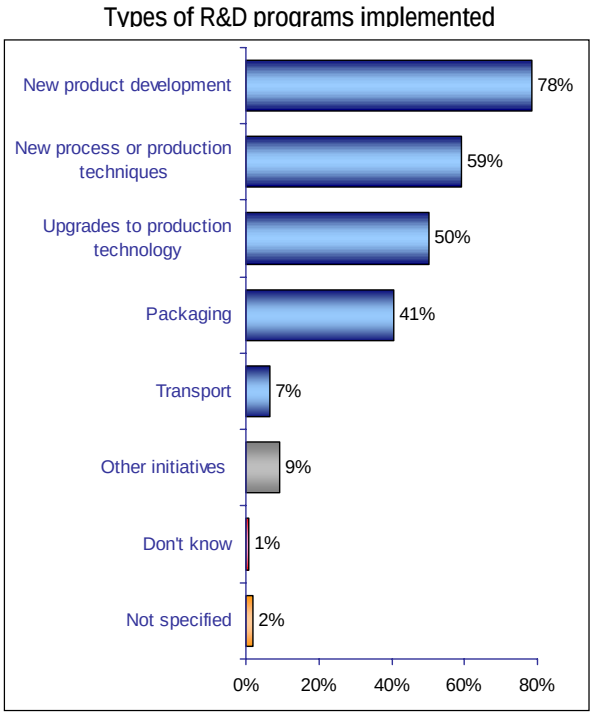
Trends:

78% of manufacturers have implemented new product development programs in the past 1-2 years.

Details:

Other R&D programs implemented include:

- 59% of manufacturers have implemented new process or production techniques, while;
- 50% have implemented upgrades to production technology, and;
- 41% have implemented packaging programs;
- A further 7% of manufacturers implemented transport programs and 9% other initiatives.
- "Other initiatives include (single responses): Advertising; Waste management; New home delivery method.
- Further analysis reveals: The incidence of these R&D programs increases in line with organisation size (staff numbers, annual sales).



Source: National Food Industry Strategy (2003), Key Data Survey of Food and Beverage Manufacturers.

Indicator # 45	Related and Supporting Industries

Supply Chain – Organisational Training

Trends:

22% of manufacturers indicated their organisation has conducted in-house training on supply chain issues, while 11% have attended external training.

Details:

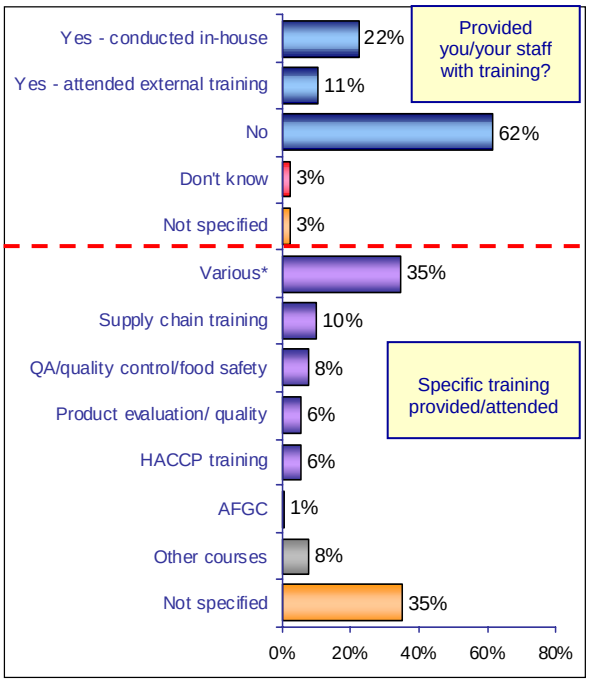
Among these manufacturers:

- The incidence of in-house training increases as staff numbers and annual sales increase.
- 62% indicated they have not provided any supply chain training.

The training provided/attended includes:

- 35% of mentions for various types (including management, marketing, OH&S, IT, customer services, etc.), while;
- 10% of manufacturers stated supply chain training, and 8% stated QA/quality control/food safety, and;
- 6% stated product evaluation/quality/handling, and/or HACCP training, and 1% stated AFGC

Organisation provided training on supply chain issues



Source: National Food Industry Strategy (2003), Key Data Survey of Food and Beverage Manufacturers.

Indicator # 46	Related and Supporting Industries

Value-chain Presence

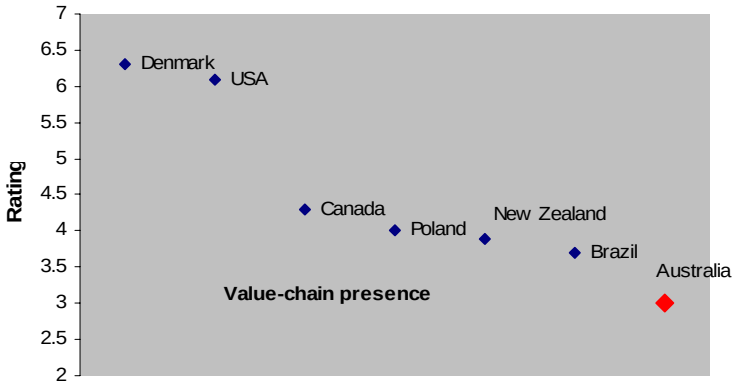
Exporting companies are (1= primarily involved in resource extraction or production, 7 = not only produce but also perform product design, marketing sales, logistics and after-sales service)?

Results:

Australia ranks 70 of the 102. Australia is perceived as having low levels of integration along the value-chain in relation to all its dairy industry competitor nations.

Issues:

- Integration along the value chain can offer industries reduced transaction costs and greaten competition.
- Australia's low rating indicates an opportunity for improving competitiveness.



World Economic Forum (2004), Global Competitiveness Report 2003-2004

Indicator # 47	Related and Supporting Industries
Supply Chain – Collaboration along the supply chain	

Trends:

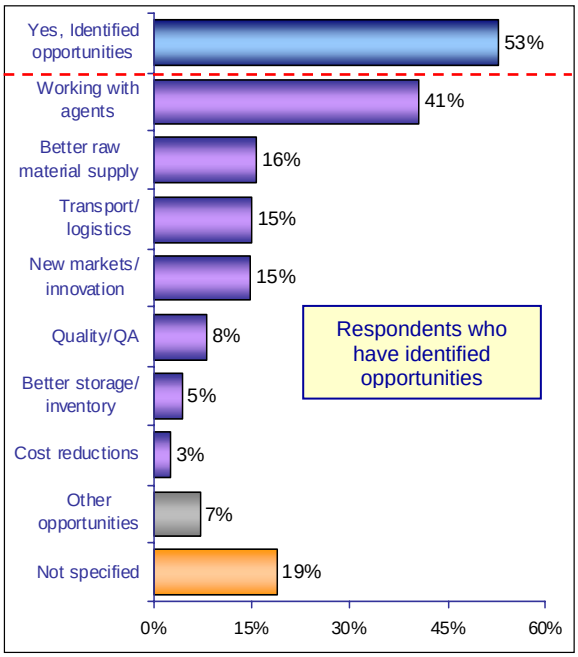
53% of manufacturers have identified commercial opportunities to improve their business performance through working with members of their supply chain.

Details:

A higher incidence of opportunity identification was evident amongst manufacturers with 201+ staff and annual sales of $20Mill+. The identified opportunities include:

- 41% of manufacturers indicated working with agents /associations /distributors/growers/processors/ retailers/suppliers which benefits business/product supply/ "just in time" – higher incidence amongst those with 501+ staff, while;
- 16% indicated better/improved raw material purchasing/supply leading to better quality and lower costs, 15% indicated transport/ transport/ logistics/ distribution/supply /freight, and 15% indicated new markets/ products/ packaging/ relationships/ business/ innovation;
- 8% indicated quality/QA/enhanced data/ systems (includes HACCP), 5% better/improved storage/ inventory and 3% cost reductions.
- 7% indicated other opportunities. The incidence of in-house training increases as staff numbers and annual sales increase

Supply chain commercial opportunities



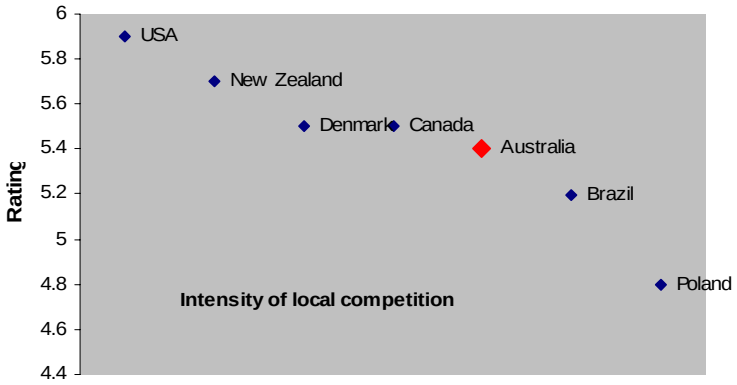
Source: National Food Industry Strategy (2003), Key Data Survey of Food and Beverage Manufacturers.

Indicator # 48	Related and Supporting Industries
Business Environment - Local Competition	

Competition in the local market is (1= limited in most industries and price cutting is rare, 7 = intense in most industries as market leadership changes over time)?

Results:

Australia ranks 18 of 102. Australia is perceived as not having the same intensity of locally based competition as many of the dairy industry competitor nations



World Economic Forum (2004), Global Competitiveness Report 2003-2004

Issues:

- Intensity of competition leads to increased innovation and competition. Increasing locally competition can be a spur to higher levels of competitiveness. Avoiding monopoly behaviour is required.

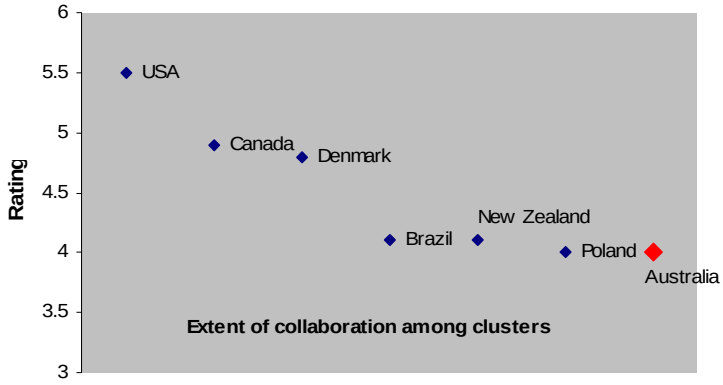
Indicator # 49 & 50	Related and Supporting Industries

Clusters

Collaboration in you clusters with suppliers and partners is (1= almost non-existent, 7 = extensive and involves suppliers, local customers, and local research institutions)?

Results:

Australia ranks 35 of the 102. Australia is perceived as having lower levels collaboration across industries when compared to its key dairy industry competitor nations.



World Economic Forum (2004), Global Competitiveness Report 2003-2004

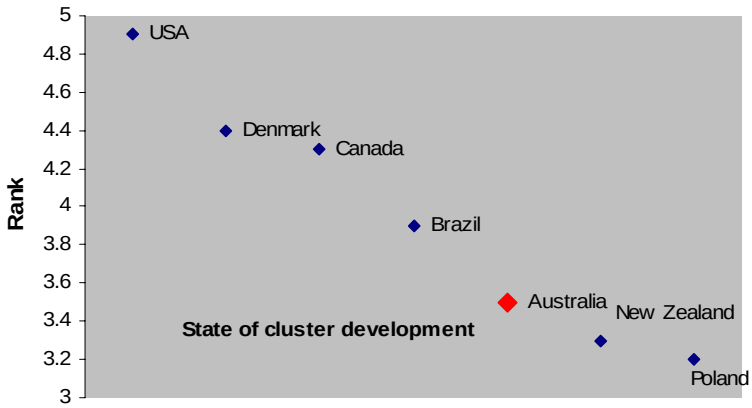
Issues:

- Australia's relatively low ranking mean it is at a competitive disadvantage to its competitors.
- It is likely to suffer higher transaction costs and less innovation.

How common are cluster (1= limited and shallow, 7 = common and deep)?

Results:

Australia ranks 34 of 102. Australia is perceived as having a limited level of industry clustering.



World Economic Forum (2004), Global Competitiveness Report 2003-2004

Issues:

- Australia's relatively low ranking and rating mean that industries are not benefiting from the reduced costs, information sharing and innovation that clustering provides. This can undermine competitiveness.

SECTION 2: MICRO (FIRM) LEVEL INDICATORS

Table of Standard Firm-level Benchmarks

Benchmarking - 21C Herds By Total Hectares Adjusted To Effective Grazed Hectares

BENCHMARKING TARGETS Position as at June 2004		Average All Herds		Average Top 20% of Herds		Average Bottom 20% of Herds		Your Herd Example 1
Herd ID No.								763
Herds in Survey	No.	23		5		5		
Land Area - Dairying	Hectares	203		251		149		250
Land Area - as Irrigated	%	37.0%	(15)	15.0%	(3)	22.2%	(3)	14.0%
Herd Size - Total Cows	Average No	307		334		355		338
Herd Size - Milking Cows	Average No	261		287		305		289
Milk Sold - % of Solids as Protein	%	44.6%		44.3%		44.9%		43.7%
Herd Bulk - Somatic Cell Count	'000 cells/ ml	177		170		222		115
Milk Yield / Milking Cow	Litres	7,893		7,568		7,098		7,314
Milk Solids / Miking Cow	kgs	575		565		526		536
Milk Solids / Hectare	kgs	899		708		1,152		619
Labour Units Equivalent	Av. No.	3.3	(23)	4.5	(5)	3.6	(5)	4.5
Total Cows / Labour Unit	Av. No.	111	(23)	85	(5)	101	(5)	76
Milking Cows / Labour Unit	Av. No.	94	(23)	72	(5)	88	(5)	65
Milk Produced / Labour Unit	Litres	781,790	(23)	608,157	(5)	620,453	(5)	473,950
Grain D.M. Fed / Cow / Day	kgs	6.1		6.6		5.1		4.4
Grain D.M. Fed / Cow / Year	Tonnes	2.22		2.42		1.86		1.60
Grain D.M. Fed / Litre	kgs	0.28		0.32		0.27		0.21
Pasture Production Efficiency	kgs	7,822		7,259		9,102		6,714
(@ 12,000 kgs of D.M. target / ha)	%	65.2%		60.5%		75.8%		56.0%
% of Milk Produced from Pasture	%	51.7%		52.8%		47.6%		68.4%
Net Milk Return	cents / litre	28.2		28.8		28.5		27.6
Grain Cost	cents / litre	8.2		9.5		8.5		7.7
Purchased Fodder Cost	cents / litre	1.6		0.8		2.6		0.7
Pasture Cost	cents / litre	4.4		4.1		4.5		4.2
Other Variable Cost	cents / litre	4.2		4.6		3.7		2.8
Gross Margin	cents / litre	9.8		9.9		9.2		12.0
Grain Value as % of Net Milk Return	%	28.9%		32.6%		29.6%		28.1%
All Purchased Feed : Pasture	Ratio	2.3:1		2.5:1		3.1:1		1.8:1
Variable Cost to Net Milk Income *(All Purchased Feed+Pasture & Other Variables)*	%	65.0%		65.5%		67.5%		56.4%
G.M. / Milking Cow	$	764		761		641		879
G.M. / Hectare	$	1,100		922		1,423		1,015
G.M. / 100 kgs of Milk Solids	$	133		132		123		164
G.M. / 1000 Litres Sold	$	98		99		92		120

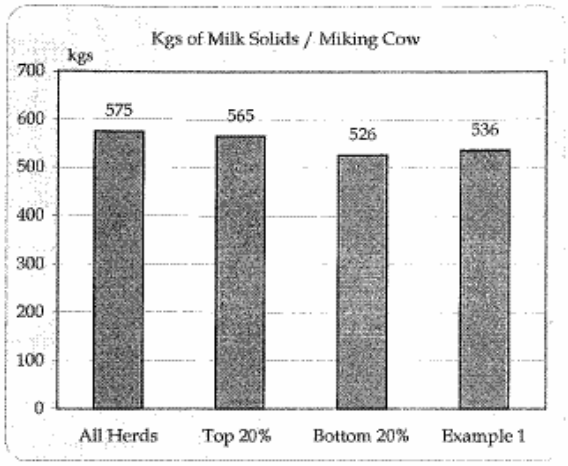
Note : ( ) indicates the number of herds with data to calculate the average for this parameter as shown in the shaded column to the right

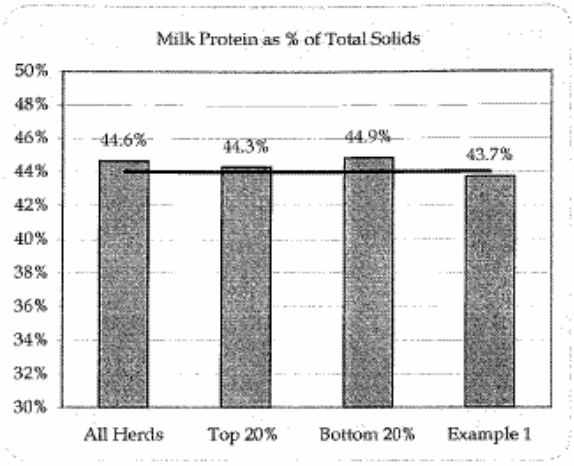
S.C. Acheson Dairy Farm Management Services Reg'd Bus No : 0351626K 15/12/04

Achenson. (2004), Acheson Dairy Farm Management.

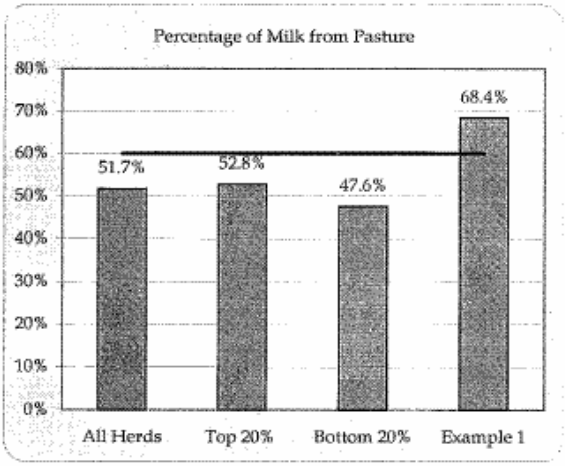
Graphs Highlighting Key Performance Indicators

Benchmarking - 21C Herds By Total Hectares Adjusted To Effective Grazed Hectares

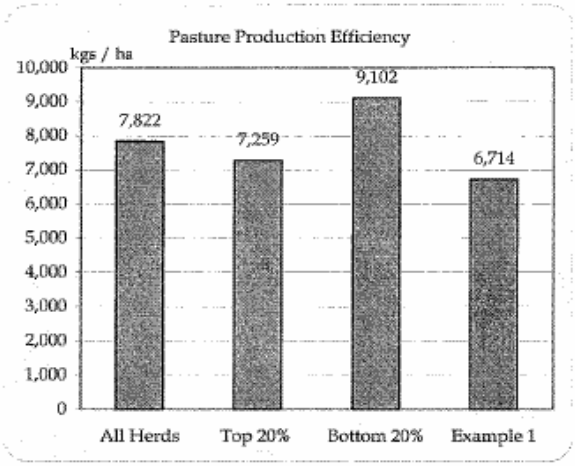




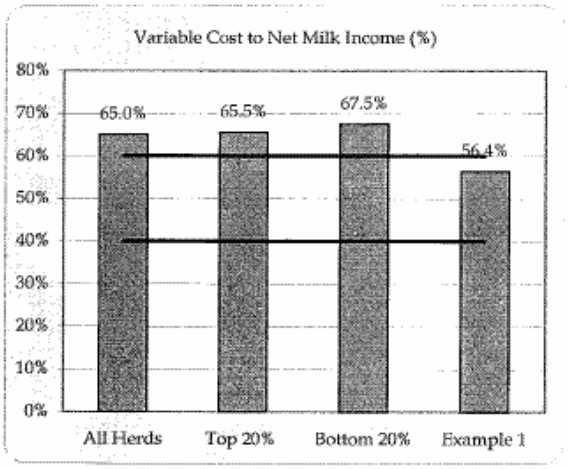
- 44% Protein Aim (indicates a balance diet being fed)



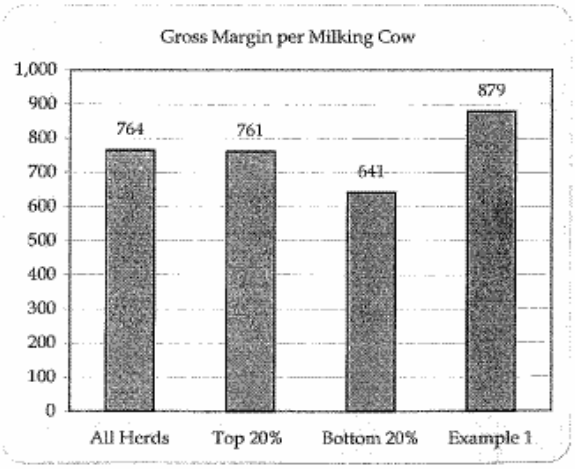
- 60% Milk from Pasture Aim (based on profitable farms)



(based on Irrigated Hectare Equivalent)



- Range 40% to 60% Aim (based on profitable farms)



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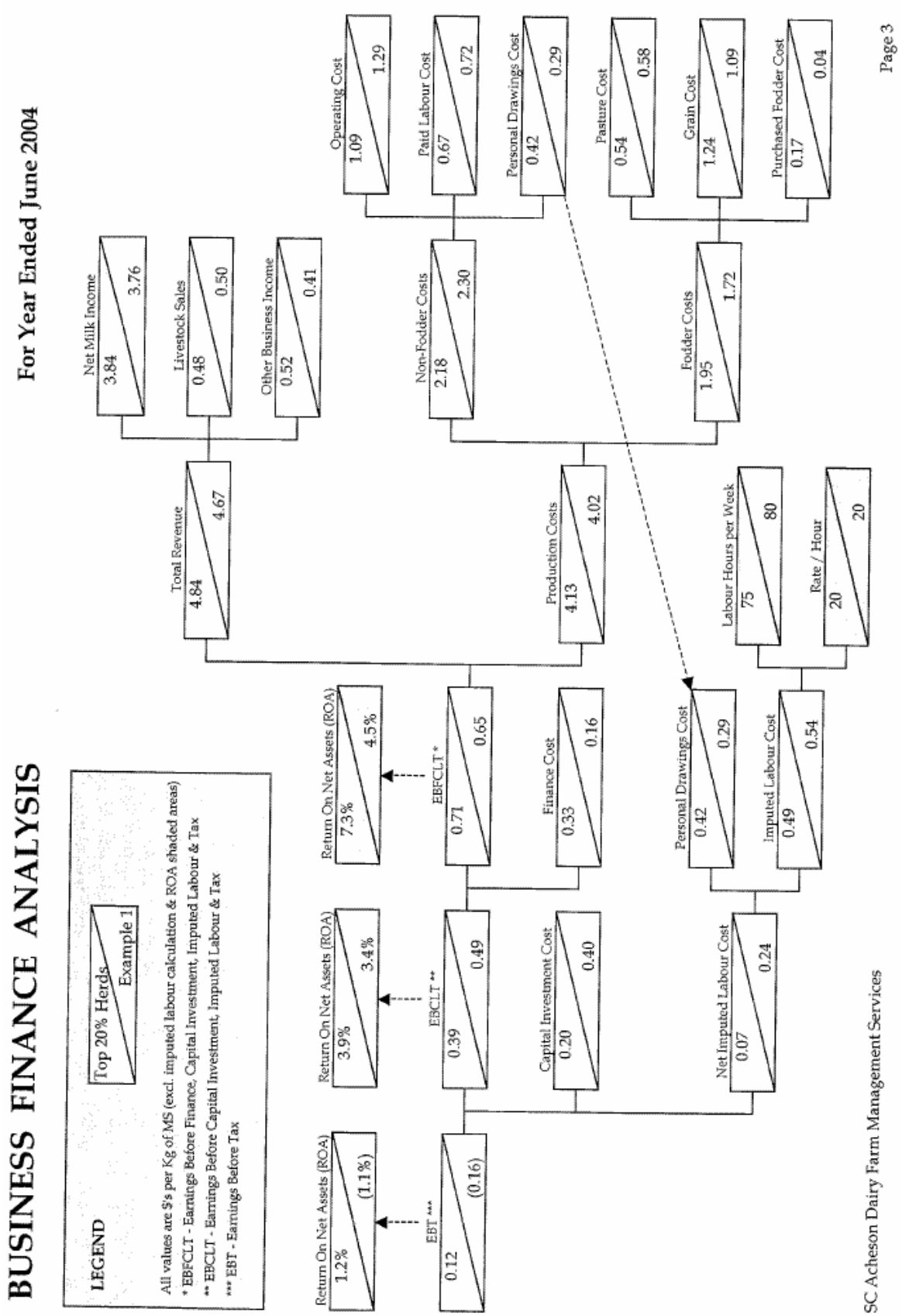
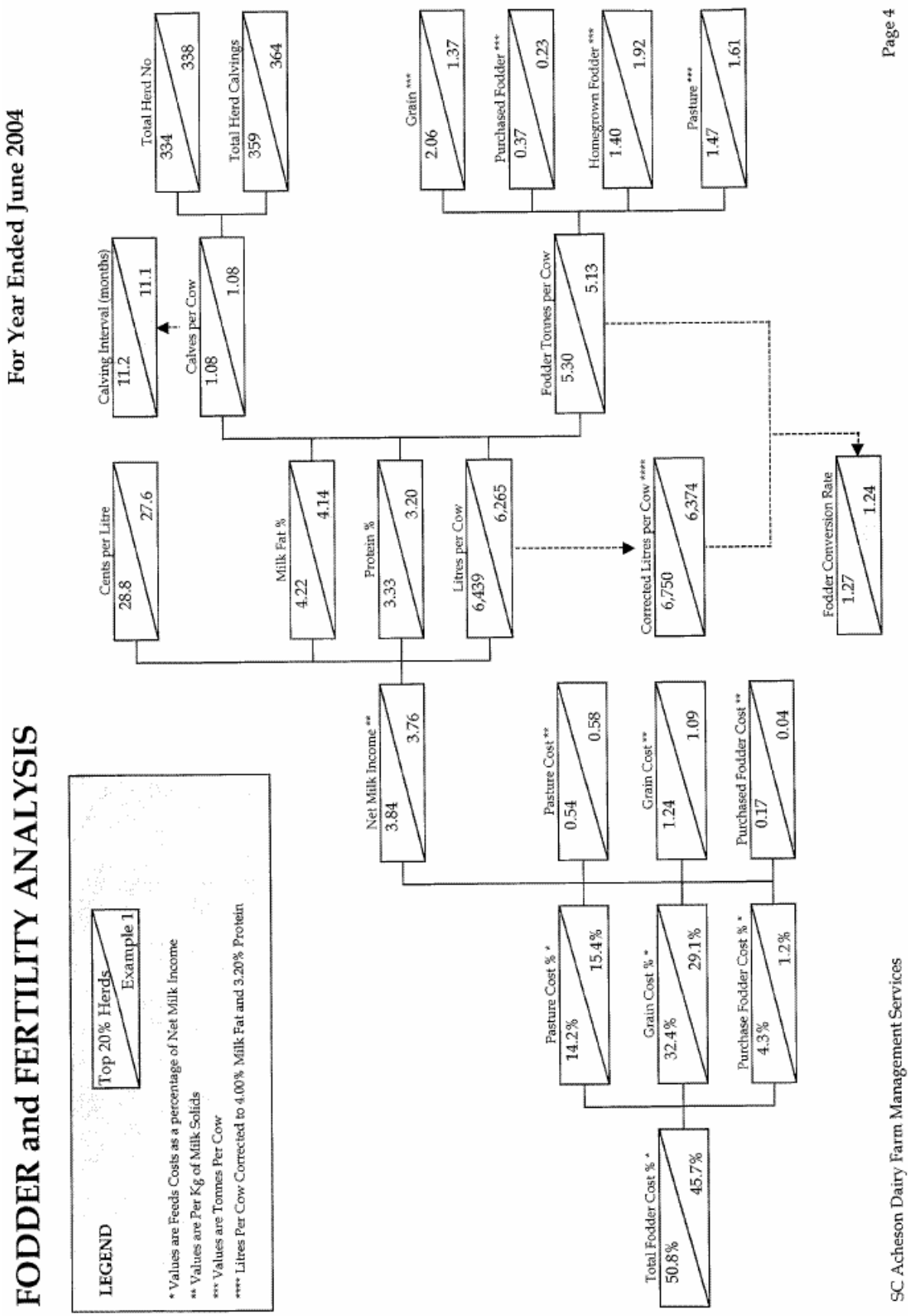
Achenson. (2004), Acheson Dairy Farm Management.

Business Finance Analysis



Achenson. (2004), Acheson Dairy Farm Management.

Fodder and Fertility Analysis



Achenson. (2004), Acheson Dairy Farm Management.