

Balancing dairy production and profits in Northern Australia

QDAS Financial and production trends – 2007

Compiled by

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The Department of Primary Industries and Fisheries (DPI&F) seeks to maximise the economic potential of Queensland's primary industries on a sustainable basis.

This publication provides a summary of physical and financial data from 119 dairy farms in Northern Australia that use the Queensland Dairy Accounting Scheme. It provides background information for farmers, agribusiness and advisers who have an interest in profitable and sustainable dairy production systems.

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Introduction

This report contains physical and financial data from 119 farms and includes data from Queensland and Northern New South Wales. For the purpose of this report, the area is called the Northern Australia dairy region, and receives funding from Subtropical Dairy.

It is estimated that the region produced approximately 665 million litres of milk from 884 farms in 2006–2007. The number of dairy farms is gradually declining. The table below shows the trend in milk supply and farm numbers for the region over the last three years.

Table 1. Dairy farm numbers and annual production for Northern Australia 2005 to 2007

	Farms	Annual production
2006-07	884	665m L
2005-06	1,037	789m L
2004-05	1,120	771m L

A thorough business analysis can be undertaken by reviewing performance using four business traits – liquidity, profitability, solvency and efficiency. These traits cover both the financial and physical aspects of the business.

Liquidity shows the cash position by monitoring all cash transactions eg a cash flow statement or a cash flow budget. Farms cooperating in QDAS use computer accounting programs to record monthly transactions, prepare their Business Activity Statements and other records for preparation of annual taxation returns. These entries are reconciled monthly. While QDAS compiles cash flow data – liquidity measures such as current ratios and the net cash surplus are not reported in this document.

Section 1 of this report presents a summary of the key findings. Three business traits – profitability, solvency and efficiency were used to measure farm performance. The results for these traits are presented using 16 key performance indicators.

The physical resources used on farms in this report are shown Section 2.

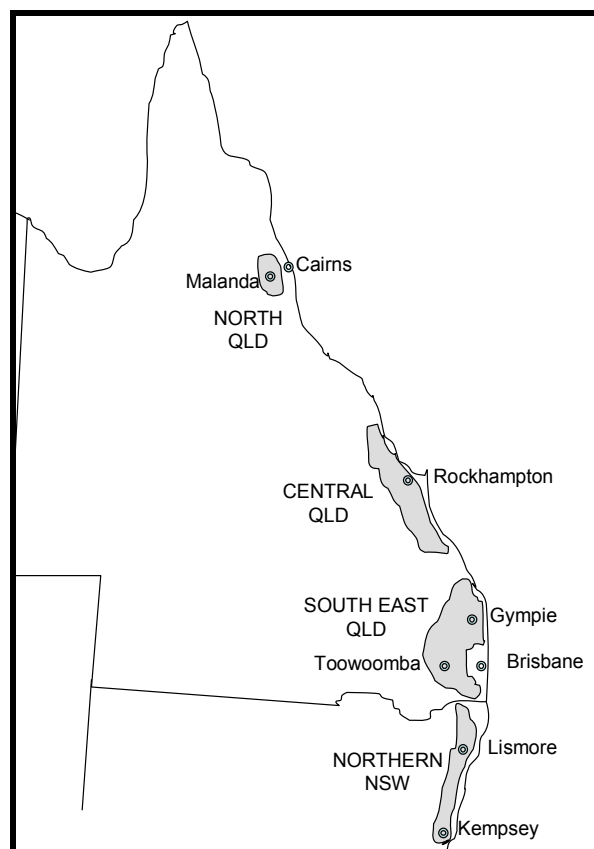
Section 3 details the trends from 72 farms that have contributed data over four continuous years. Analysis of their data gives an accurate reflection of changes in the Northern Australian dairy industry.

Section 4 details the characteristics of the most profitable farms in QDAS. Production per cow, the effect of herd size and production from home grown feed are aspects examined.

In Section 5, the cost of production calculated in cash and on a profit basis, as well as capital efficiency, administration costs and labour are detailed.

The appendices contain summary reports for all QDAS farms, the top 25% farms and each region. The appendices also contain a list of definitions for the business traits and key performance indicators used in QDAS.

Figure 1. The location of dairy farms in Northern Australia



Objectives

The objectives of this book are to:

- Provide Queensland Dairy Accounting Scheme (QDAS) participants with a summary of physical and financial data from South-east Queensland, North Queensland and Northern New South Wales. This, together with their own farm reports, will give dairy farming families/enterprises information that will enable them to make more informed business decisions.
- Act as a resource guide for local advisers, consultants and other industry service personnel who wish to encourage positive change.
- Provide background material for industry participants negotiating with banks, governments, suppliers or other agents.

About QDAS

The Queensland Dairy Accounting Scheme (QDAS) was established to improve the understanding of business principles among advisors and dairy farmers by providing farm management accounting and analysis. Originally the basis of the analysis was an examination of the annual variable costs. The data was used to answer questions such as “is the production of an extra unit of milk profitable”. QDAS has evolved to now examine the business traits of solvency, profitability and efficiency but still maintains a similar aim to help dairy farmers make informed decisions based on business information.

Officers of the Queensland Department of Primary Industries and Fisheries, the NSW Department of Primary Industries and milk processing companies collect data by visiting farms between August and November.

Farmer participation in QDAS is voluntary and free. Results and trends need to be interpreted carefully as QDAS farms have larger herds and produce more milk per farm than the Northern Australian average.

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1. 2006–2007 Results – Key findings

Sixteen Key Performance Indicators (KPI) are used to highlight the results for profitability, solvency and efficiency. Table 2 shows these results for 2006-2007 and the preceding three years. Further to this is the calculation of these KPI for the top twenty five percent of farms. These top farms have been identified as the farms with the highest dairy operating profit measured as dollars per cow.

Dairy operating profit highlights the amount of profit retained after paying all expenses except finance costs and taxes. These expenses include the non-cash items of depreciation and an allowance for the manager's time and skill (called imputed labour). Cattle trading profit and inventory adjustments are also included.

Appendices contain profit maps which show the income and costs included in the calculation of dairy operating profit.

Table 2. Financial and performance ratios for QDAS farms (2003-04 to 2006-07)

Business traits and indicators ⁽¹⁾	Top 25%	QDAS average	Past QDAS averages		
	2006-07	2006-07	2005-06	2004-05	2003-04
Profitability					
Return on assets - operational (%)	3.3	1.1	3.0	3.3	2.6
Return on equity - operational (%)	2.6	-0.3	1.9	2.3	1.3
Operating profit margin (%)	20.1	6.1	15.0	16.0	11.4
Dairy operating profit (\$/cow)	551	147	362	357	229
Solvency					
Equity (%)	86	84	84	83	81
Debt to equity ratio	0.17	0.20	0.19	0.22	0.24
Efficiency – Capital/Finance					
Asset turnover ratio	0.16	0.18	0.20	0.22	0.23
Total liabilities per cow (\$)	2,394	2,182	1,898	1,841	1,688
Interest paid/cow (\$)	180	184	174	154	135
Efficiency – Productivity					
Feed related costs (c/L)	22.9	24.7	20.4	19.8	18.8
Margin over feed related costs (\$/cow)	15.3	13.0	15.3	14.4	14.8
Total variable costs (c/L)	26.1	28.1	23.9	23.1	22.0
Gross margin - milk (\$/cow)	688	544	674	606	608
Efficiency – Physical					
Litres of milk from home grown feed (L/day)	10.8	9.5	10.3	10.2	10.0
Production per cow (L)	5,692	5,664	5,678	5,422	5,271
Litres per labour unit					
- On farms <1.0 m L	332,091	331,424	356,710	368,835	344,903
- On farms >1.0 m L	489,162	513,677	523,511	514,334	497,295

⁽¹⁾ The definition of each indicator and how it is calculated can be found in Appendix 6.

1.1 Major findings for industry

Profitability

Profitability declined in the northern dairy industry in 2006-07. Compared to the prior year, operating profit per cow dropped by \$249 from \$800 to \$551 per cow in the top group and by \$178 from \$325 to \$147 per cow on the average farm.

The average operational return is low at 1.1%, but top farms were able to achieve 3.3%. Land values continued to improve and this resulted in a capital growth of 14%.

There has been virtually no investment in new technology in the last few years and for some farms since 2000. This comment is also supported by other industry surveys.

Solvency

Operational return on equity was negative. Farm equity remains strong at 84%. However, debt per cow rose by \$284 to \$2,182. Table 18 shows the average investment for the QDAS group between \$14,266 to \$14,900 per cow in Queensland, while in Northern NSW the value the investment was \$12,696 per cow. The top group of farms had a higher debt per cow at \$2,394.

Overdraft levels increased during the year as they have done for the last few years.

Efficiency

Given general farming conditions in most of the collection areas a variable cost figure of 28.1 c/L was expected. Mid year, farmers were saying that feed costs were four to six cents higher than in 2006. The litres of milk from home grown feed including conserved silage and hay was low at 9.5 litres per cow, but probably acceptable given the poor growing conditions.

Per cow production of 5,664 litres was consistent with the prior year. Many farms were forced to purchase poor quality forage during the year and ration formulation became a most important priority.

Feed related costs at \$1,398 per cow accounted for 65.5% of the gross milk income. The impact of this cost filtered through to the final margins and profitability returns.

1.2 Major findings for farmers

The average cash cost of production was 43.6 c/L, giving a cash surplus of just 0.3 c/L. The group labelled top had a much higher cash surplus of 7.8 c/L attributed to higher cattle sales and feed related costs being approximately 2 cents lower. Tables 16 and 17 in Section 5.1 show both the cash cost and the cost as calculated in a profit calculation.

The appendices show the cash gross margin for all dairy regions. The variable costs for each region range from 26.7 to 28.9 c/L and are shown both on a litre basis and per cow in Table 3.

Labour is a critical factor for farmers. There is a general shortage of skilled labour, pay rates in competitive industries make it difficult to attract farm workers. The labour input required by owners, together with the poor returns are the key reasons given for farmers leaving the industry. In Queensland, approximately 835 farms, have ceased production since the year 2000.

The data in Section 5.4 describes the present labour resources and the cost. Even at \$15 per hour, the owner's contribution on the average farm was valued at just under \$80,000, more than most draw as a living expense.

Table 3. Variable cost and margins in c/L and \$ per cow (2006-2007)

	c/L	\$/cow	Margin on milk/cow	Margin whole farm/cow
South-east QLD	28.9	1,715	607	987
North QLD	26.7	1,447	460	903
Northern NSW	28.1	1,519	494	821

Regional trends

72 farms provided continuous data over the last 4 years. Analysis on this data (Section 3) shows the trends since 2004:

In the last 12 months, very modest increase in milk returns- 2.8 c/L in the south and 1.2 c/L in the north.

Per cow production was stable in the south and the effect of cyclone Larry reduced production in the north by 417 litres per cow. Some industry observers expected the effects to be less dramatic. Lower herd fertility had a major impact in North Queensland.

Feed costs increased in all areas.

Operating profit in the south fell significantly, while in the north grants from for cyclone recovery flowed through 2006-2007.

Equity remained strong at over 80% in each region.

Efficiency

Farms with high production per cow, for example greater than 6,000 litres, had higher operating profits in both total dollars and when expressed as a percentage (see Section 4.1).

Farms producing large volumes of milk, showed that size was not an impediment to achieving high volumes per cow (see Section 4.2). The need to source and feed larger quantities of poor quality forage impacted on production per cow.

However, the two largest groups were able to achieve 20 litres per cow per day.

When farms were divided into two groups based on their feed costs the group with costs below the regional average always produced more milk from home grown feed and they also recorded the highest operating profit. This is shown in Section 4.3.

No analyses based on stocking rate (cows/ha) were conducted on the 2006-07 data as many farms were producing milk using partial or fully mixed rations usually with a high purchased feed component.

The investment required for dairying in all regions is shown in Section 5.2. Land accounted for approximately three quarters of the asset value.

Administration costs get proportionately lower as farm production increases, varying from 3.2 c/L or \$181 per cow on small farms to 1.8 c/L or \$125 per cow on the largest farms (see Section 5.3).

2. Physical resources on regional dairy farms

Herd details, stocking rates and the number of labour units are shown in the following group of tables for each dairy region. These details are

calculated for small and large farms. More information on labour requirements for different production levels is given in section 5.4.

Table 4. North Queensland physical farm resources

North Queensland	Farm production	
	<1 million litres	>1 million litres
Mean production (Litres)	640,438	2,553,287
Milkers + dry cows	151	437
Mated heifers	22	60
Other heifers	65	198
Total dairy herd	238	695
Milking cow area (ha)	91	146
Effective dairy area (ha)	155	314
Stocking rate on milking area (cows/ha)	1.66	2.99
Labour units	1.8	4.3
Labour units required @38 hr week	2.7	5.7

Table 6. Darling Downs physical farm resources

Darling Downs	Farm production	
	<1 million litres	>1 million litres
Mean production (Litres)	590,018	1,634,196
Milkers + dry cows	111	222
Mated heifers	27	45
Other heifers	46	156
Total dairy herd	184	423
Milking cow area (ha)	164	162
Effective dairy area (ha)	248	399
Stocking rate on milking area (cows/ha)	0.68	1.37
Labour units	2.2	3.0
Labour units required @38 hr week	2.6	4.3

Table 5. South East Queensland (excluding Darling Downs) physical farm resources

South East Queensland	Farm production	
	<1 million litres	>1 million litres
Mean production (Litres)	719,244	1,492,788
Milkers + dry cows	146	250
Mated heifers	30	42
Other heifers	61	102
Total dairy herd	244	394
Milking cow area (ha)	58	81
Effective dairy area (ha)	145	168
Stocking rate on milking area (cows/ha)	2.52	3.09
Labour units	1.8	3.3
Labour units required @38 hr week	3.1	4.1

Table 7. Northern NSW physical farm resources

North Queensland	Farm production	
	<1 million litres	>1 million litres
Mean production (Litres)	651,536	1,555,390
Milkers + dry cows	127	283
Mated heifers	24	48
Other heifers	60	125
Total dairy herd	211	456
Milking cow area (ha)	59	109
Effective dairy area (ha)	108	193
Stocking rate on milking area (cows/ha)	2.15	2.60
Labour units	2.1	3.5
Labour units required @38 hr week	3.0	4.3

3. Regional trends

Participation in QDAS is voluntary with 119 farms taking part this year. Fourteen percent of farms supply QDAS data for analysis. While this provides significant information, it is not a random sample of the industry. In fact, the average QDAS farm produces 445,000 litres (60%) more milk annually than the average Northern Australian dairy farm.

From the sample, 72 farms have taken part in QDAS for at least the last four years. An analysis of the data from these farms shows the trends in KPI over the last four years, for South East Queensland, North Queensland and the Northern New South Wales dairy regions in Northern Australia. Insufficient data was available to accurately reflect the position in Central Queensland.

General comments:

For different reasons farmers in each region experienced a challenging year. Cyclone Larry

devastated North Queensland in March 2006, the effect on pasture production and rebuilding of farm capacity took place through the 2006-07 year. The table below shows that average per cow production dropped by over 400 litres on the prior year. To offset some of the disruption to production and assist in rebuilding production capacity, grants on average of \$60,000 were made to each farm. This amount is included in the farm income as an offset to interest, repairs and labour costs. All regions experienced higher input costs – concentrates, fuel and fertiliser in particular.

In South Queensland the variable production cost rose by 5.4 c/L. All regions received a very modest increase in milk returns approximately 2.7 c/L in the south and just 1.2 c/L in north Queensland.

Further details can be obtained from the tables and graphs below.

Figure 2 Dairy operating profit per cow (2003-04 to 2006-07)

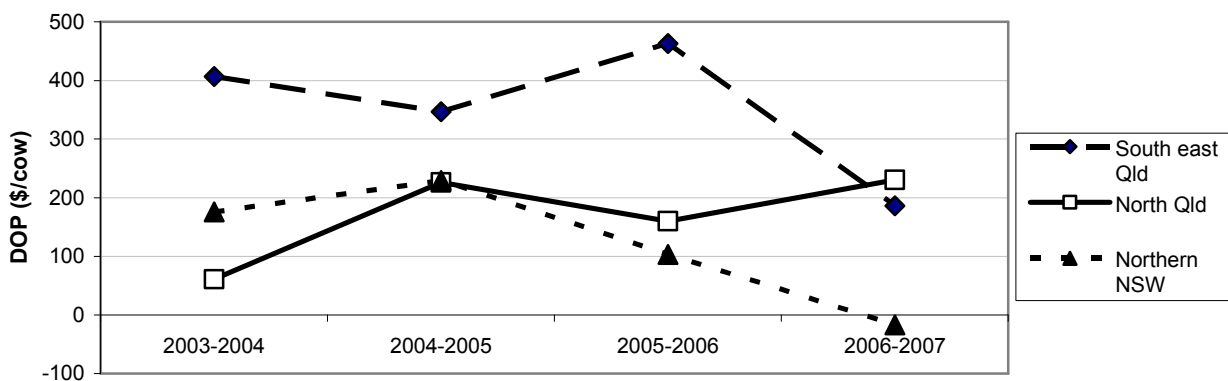
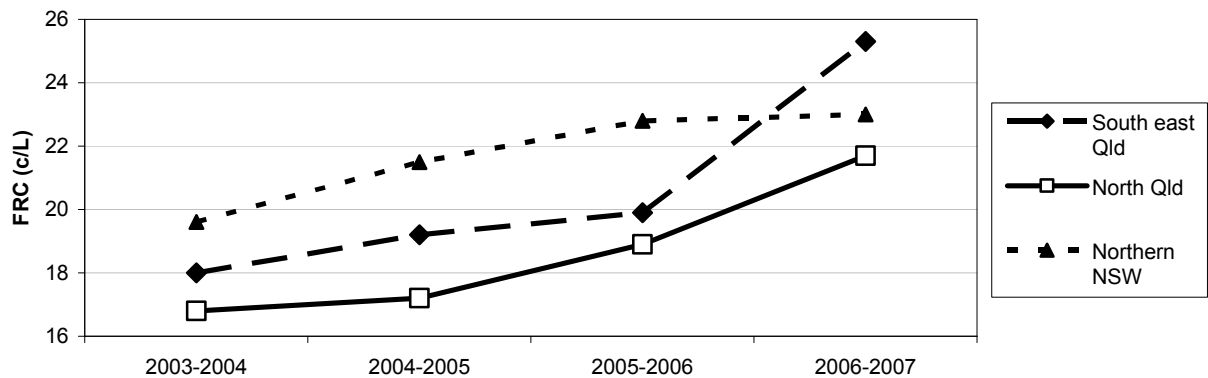


Figure 3 Feed related costs per litre (2003-04 to 2006-07)



3.1 South-east Queensland

- Average farm production was 1,020,226 litres and has been relatively stable for the last three years, reflecting little change in individual animal production or size of the milking herd.
- Feed related costs increased significantly by 5.4 c/L on last year to 25.3 c/L. Total variable costs now represent 72% of the gross milk income.
- Dairy operating profit per cow fell by \$277 or 60% on the prior year, a reflection of the increased grain, fuel and fertiliser prices. The Downs, Burnett and Beaudesert areas were drought declared for the whole of 2006-2007.

Table 8. South-east Queensland trends (2003-2004 to 2006-2007)

	2003-2004	2004-2005	2005-2006	2006-2007
Total milk income (c/L)	34.1	35.2	36.6	39.4
Average herd size	171	177	180	177
Production per cow (L)	5,575	5,746	5,888	5,764
Feed related costs (c/L)	18.0	19.2	19.9	25.3
Total variable costs (c/L)	21.0	22.2	23.0	28.4
Gross margin (c/L)	13.1	13.0	13.7	11.0
Equity (%)	84	84	87	87
Return on assets (%)	3.7	2.9	3.2	1.2
Operating profit margin (%)	18.2	14.9	18.3	7.3
Dairy operating profit (\$/cow)	407	347	463	186

3.2 North Queensland

- Average milk production was 1,145,499 litres in 2007, very similar to the preceding 3 years. The table below shows a slight increase in cow numbers while production per cow declined in the last year by 417 litres.
- Feed costs have increased each year, in 2007 they were 21.7 c/L, total variable costs increased to 25.5 c/L an increase of 3.2 cents on the prior year.
- The effects of cyclone Larry were evident on pasture and animal production. Both milk production and herd fertility were affected.
- The special cyclone Larry payments lifted farm income considerably and this is reflected in the increased operating profit.
- There are some advantages when dairying in the tropical NQ, but grain and protein meals have to be sourced from central and southern areas, and this incurs significant freight costs.

Table 9. North Queensland trends (2003-2004 to 2006-2007)

	2003-2004	2004-2005	2005-2006	2006-2007
Total milk income (c/L)	29.5	30.2	33.5	34.7
Average herd size	193	192	195	201
Production per cow (L)	5,562	5,937	6,116	5,699
Feed related costs (c/L)	16.8	17.2	18.9	21.7
Total variable costs (c/L)	20.4	20.6	22.3	25.5
Gross margin (c/L)	9.2	9.6	11.2	9.2
Equity (%)	84	85	87	88
Return on assets (%)	0.7	1.8	1.2	1.4
Operating profit margin (%)	3.4	10.6	7.0	9.6
Dairy operating profit (\$/cow)	61	226	160	230

3.3 Northern New South Wales

- Average annual farm production increased only marginally in the last four years - by 159,932 litres to 1,380,352 litres.
- The increase in production over the four years was due to an increase in herd size of 30 milkers, production per cow remained steady.
- Total variable costs increased from 23.0 to 26.7 c/L. Other operating costs also increased over the period resulting in a reduced dairy operating profit.
- For the first time in four years the return on assets and equity were negative, farmers still maintain strong equity in their dairy operation.

Table 10. Northern New South Wales trends (2003-2004 to 2006-2007)

	2003-2004	2004-2005	2005-2006	2006-2007
Total milk income (c/L)	34.5	34.4	35.3	37.9
Average herd size	226	240	253	256
Production per cow (L)	5,400	5,303	5,352	5,392
Feed related costs (c/L)	19.6	21.5	22.8	23.0
Total variable costs (c/L)	23.0	25.1	26.5	26.7
Gross margin (c/L)	11.5	9.4	8.7	11.1
Equity (%)	82	84	82	85
Return on assets (%)	2.6	1.9	0.8	-0.1
Operating profit margin (%)	8.5	10.5	4.5	-0.7
Dairy operating profit (\$/cow)	176	229	103	-17

4. The characteristics of profitable farms

To identify the characteristics of the most profitable farms, all farms were ranked in order of dairy operating profit per cow. They were then divided into two groups, the top 25% and the remaining 75%. Table 11 compares the KPI of the two groups.

Our analysis shows that the more profitable farms based on operating profit per cow achieved their result because-

- Total farm cash receipts were 3.5 c/L higher and the receipt in profit terms was 6.9 c/L higher.
- The figure was skewed somewhat by the payments received from cyclone Larry on the Atherton Tableland, but higher receipts for freight subsidies and interest payments under exceptional circumstances were also evident in the south.
- Cattle trading profit was almost double at \$178 compared to \$94 per cow for the remaining 75% group.
- The top group also had a positive adjustment for feed inventories.
- Feed related costs were \$108 per cow lower.
- The gross margin from milk was \$182 per cow higher. This figure is calculated without the inclusion of Larry payments.
- An extra 1.7 litres were produced from home grown feed per cow.

When the data is analysed the operating profit was \$551 versus \$39 per cow for 2006-2007 in the two groups. However when both groups are amalgamated the QDAS result for the whole group averages \$147 per cow.

Table 11. KPI for top 25% & remaining 75% of farms (2006-2007)

	Top 25%	Remaining 75%
Average herd size	183	223
Production per cow (L)	5,692	5,628
Total farm receipts (c/L)	48.1	44.6
Feed related costs (c/L)	22.9	25.1
Feed related costs (\$/cow)	1,304	1,412
Milk from HGF(L)	10.8	9.1
Gross margin- milk (\$/cow)	688	506
Dairy operating profit (\$/cow)	551	39

4.1 Production per cow

Throughout the history of QDAS it has been consistently shown that as a cow's diet is improved, thereby utilising her genetic potential, the result will be an increase in the margin over feed costs, the gross margin per cow and the gross margin for the whole farm. These relationships certainly held to production levels of 6,500 litres per cow.

There are several interesting issues raised by this data in Table 12.

- The data shows that it is not the farms with the small herds that are able to have high production per cow. In fact it is the farms with large herds that are implementing management systems to greatly increase production per cow to 6,500 litres and above.
- While the margin over feed related costs per litre fluctuated on a per litre basis, the margin per cow increased from \$263 to \$896, tapering off slightly at production levels around 7,500 litres to \$814.

There may be a limit however to increasing production using high cost supplements. The curve shown in Figure 4 declines at the highest levels indicating an economic production per cow may have been reached in this year. To calculate herd size QDAS includes milking and dry cows.

With the prolonged drought on the Darling Downs, many farms found it necessary to purchase large volumes of low quality forage as well as the traditional concentrates. These high

input dairy systems demanded high milk volumes obtained through well formulated rations to remain viable. While feed costs were high, a small profit was achieved as shown in the 7,000 litre group.

If changing to a high input system it is essential to maximise home grown feed utilisation and produce large volumes of milk, in an industry with low margins.

Farmers contemplating expansion or a change to a high input systems, should address the aspects of phasing and sizing their enterprise very seriously. The M5 information series on the web at www.dairyinfo.biz covers these topics in some detail.

Figure 4. The relationship between production per cow and margin over feed costs (2006–2007)

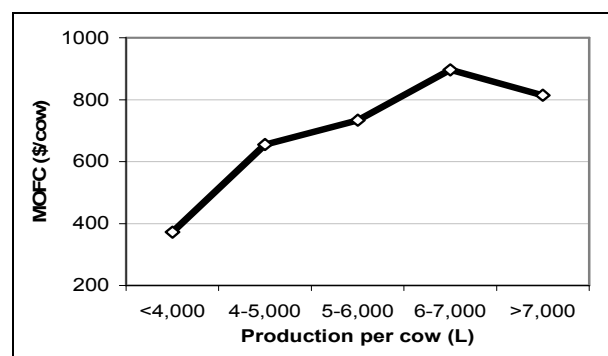


Table 12. KPI for 5 per cow production groups (2006-2007)

	<4,000 L	4-5,000 L	5-6,000 L	6-7,000 L	>7,000 L
No of farms	11	27	37	26	17
Farm milk production (L)	558,634	943,839	1,32,2400	1,211,625	1,691,349
Average herd size	165	203	239	189	226
Production/cow (L)	3,380	4,650	5,544	6,420	7,472
Total milk income (c/L)	39.3	38.5	38.2	39.1	38.4
Margin over FRC (c/L)	11.0	14.1	13.2	14.0	10.9
Margin over FRC/cow (\$)	372	655	734	896	814
Gross margin/cow (\$)	263	480	541	666	602
Gross margin/farm (\$)	113,304	159,836	206,681	213,801	247,979
Dairy operating profit (\$)	26,579	22,082	22,430	51,446	34,336
Dairy operating profit (\$/cow)	161	109	94	273	152

4.2 Herd size

The difficult year is reflected in all 4 groups of farms shown in Table 13. The margins and profitability are low. Last year the operating profit per cow on the largest farms was \$455, down this year by \$278 to \$177 per cow.

Observations made from QDAS data support other recent industry surveys which have shown that farmers are reluctant to invest new technology till industry conditions improve.

Table 1 in the introduction showed the continuing industry decline in the sub-tropical dairy region.

Most farms by necessity have fed increasing levels of bought in feed, both fibre and concentrate.

Many farms on the Downs have adopted a feedlot system of production. While the margins per litre are tight, the increased production has allowed them to remain farming. It was critical for these farms to optimise production with “better” balanced rations.

It was possible for large herds to still achieve 20 litres per cow per day.

With the low returns for milk, feed costs and total variable costs are increasing as a percentage of milk income. Feed related costs range from 62 to 68% while total variable costs ranged from 72-78% of each milk dollar across the groups.

This means a healthy gross margin is essential to achieve high operating profits. The major farm costs are feed, labour and debt servicing.

Larger farms produce more milk per labour unit, over 600,000 litres versus 272,682 litres on the smaller farms, a key efficiency trait that must be addressed as herds increase in size. With labour costs of six to nine c/L, the trade off is between paying labour and spending funds on capital improvements. Farmers’ often express concern about sourcing reliable farm labour and about competing wage rates in other industries.

The trend in gross margin and operating profit with increasing farm production is shown in the graphs below.

Figure 5. Relationship between farm milk production and dairy operating profit per cow (2006-2007)

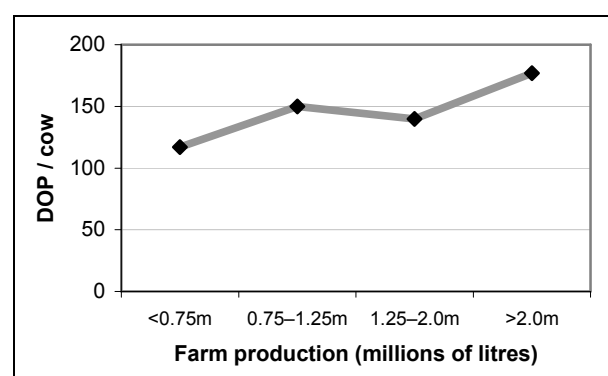


Table 13. KPI for farms in 4 production groups (2006-2007)

	<750,000 L	750,000 – 1.25m L	1.25 – 2.0m L	>2.0m L
Farm milk production (L)	518,096	998,419	1,569,025	2,975,019
Herd Size	116	181	264	506
Production per cow (L)	4,555	5,668	6,087	5,993
Margin over FRC (\$/cow)	550	824	780	726
Gross margin (milk)/cow (\$)	382	613	575	548
Gross margin/farm (\$)	94,740	179,252	253,365	448,634
Litres per labour unit	272,682	416,008	448,293	619,796
Return on assets (%)	0.7	1.0	1.1	1.8
Operating profit margin (%)	5.5	6.1	5.4	7.2
Dairy operating profit (\$)	13,596	27,100	36,863	89,346
Dairy operating profit (\$/cow)	117	150	140	177
% Milk from home grown feed	48	55	53	45

*Return on assets is from the dairy operation, it does not include capital appreciation on the land

4.3 Milk production from home-grown feed

Past reports and research have shown that optimising utilisation of home-grown feed can control feed related costs and improve gross margins and profit. Farms with high paddock feed utilisation can also maintain acceptable individual cow production.

Table 15 shows the production from home-grown feed (grazing + conserved home grown hay and silage) for farms with below and above average regional feed related costs per litre cost (25.8 in SEQ, 24.0 in NQ and 24.2 in NNSW). Points to note:

- All farms could improve production from home-grown feeds, but under drought conditions a creditable result was achieved on many farms.
- In all regions where the lowest feed related costs were recorded farms produced the most milk from home feed, and they also obtained the highest dairy operating profit per cow.

The production per cow shown in Table 15 is below the potential 13–17 litres achieved from forage in research trials; the result achieved on the “best” Northern NSW farms (12.5 L) is closest to the milk production potential from tropical pastures. Targets for milk yields can be found in Table 14.

Table 14. Target milk yields from forage

Pasture system	Tropical	Temperate
Potential yield from pasture (L)	3,500 – 4,000	4,500 – 5,200
Production target L/ cow	6,500	7,500
% Required from forage	55 – 60	60 – 65
Daily milk from forage (L)	11.5 – 13.5	15.0 – 17.0

Table 15. Production and operating profit for farms above and below the regional FRC average (2006 -2007)

Region	Below the regional FRC average		Above the regional FRC average	
	Litres per cow	DOP (\$/cow)	Litres per cow	DOP (\$/cow)
South-east Queensland – (regional average 25.8 c/L)	11.1	320	6.1	41
North Queensland – (regional average 24.0 c/L)	10.4	406	10.1	358
Northern NSW – (regional average 24.2 c/L)	12.5	110	9.0	-354

4.4 Forage Utilisation in northern Australia

The most recent research project being undertaken in Queensland is entitled Forage Plu\$. QDAS provides detailed background material related to forage utilisation and production.

The amount of forage utilised in 2007 across the Northern dairy region was approximately 7 t DM/ha/year, which has been increasing slightly over the past 9 years (approximately 150 kgs/ha/year).

The following graph (Fig 6) plots the average forage utilised per cow of both home grown and total forage utilised on QDAS farms over the past 9 years from 1999 to 2007. The graph clearly shows that the amount of total and home grown forage utilised per cow has declined during the dryer years of 2003 to present, and the proportion of home grown forage within total forage utilised has only dropped marginally from 99% in 1999 to 90% in 2007. This highlights that there has been a greater reliance on purchased forage in recent years due to drought.

- In 1999 forage consumption per cow was approximately 3.3 t DM/cow, which increased by 400 kgs/cow to 3.7 t in 2001. In 2007 the figure has declined by 700 kg/cow to 3.0 t DM/cow. However over this 9 year period,

the average production per cow has increased by 400 litres per cow from 5290 L in 1999 to 5670 L in 2007, which is a reflection of an increase in concentrate use during recent years.

- Farms in the Darling Downs region tended to utilise more forage per cow over the 9 year period compared to other regions (Fig 7). This is a reflection of the larger farm size, lower stocking rate and higher production per cow.
- On an annual basis over the 9 year period, irrigated farms tended to utilise approximately 2 t DM/ha more than dryland farms (5 and 7 t DM/ha for irrigated and dryland farms respectively). However the total forage consumed per cow were only 300 kg/cow/year for irrigated farms compared to dryland farms.
- In 2007, the irrigated farms were only 79 kg/ha and 83 kg/cow higher in total forage utilised compared to dryland farms, highlighting the reduction in irrigation water in recent years due to drought.

Figure 6. Yearly average forage utilised per cow per year from 1999 to 2007.

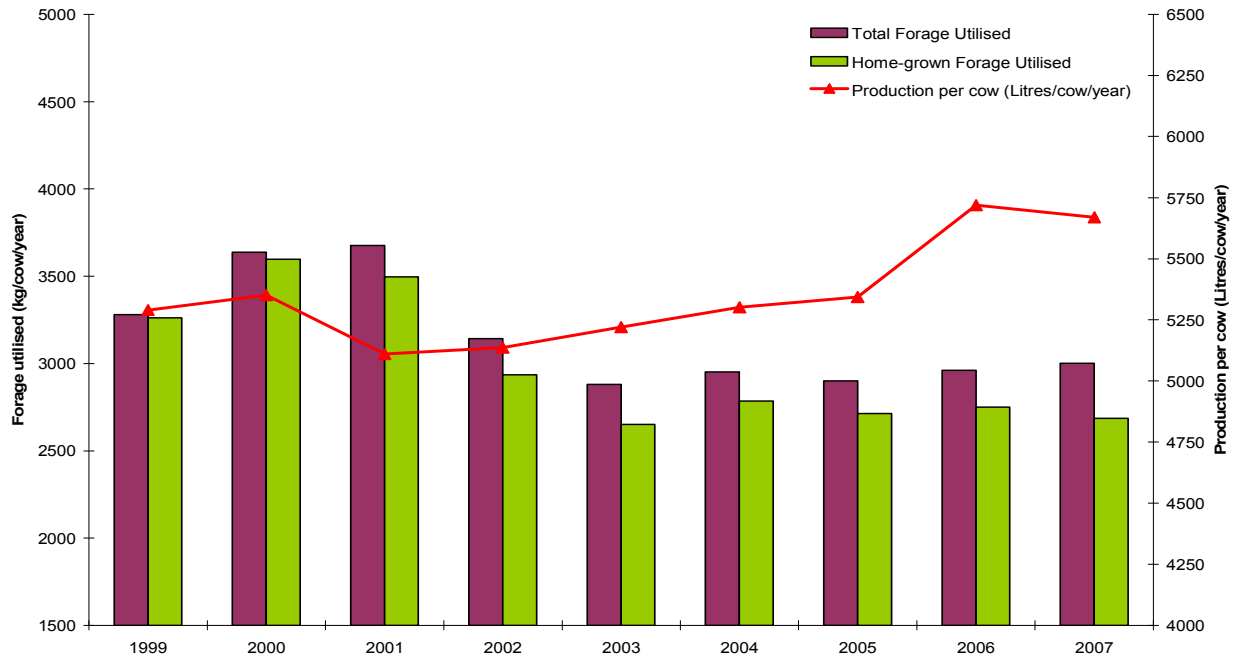
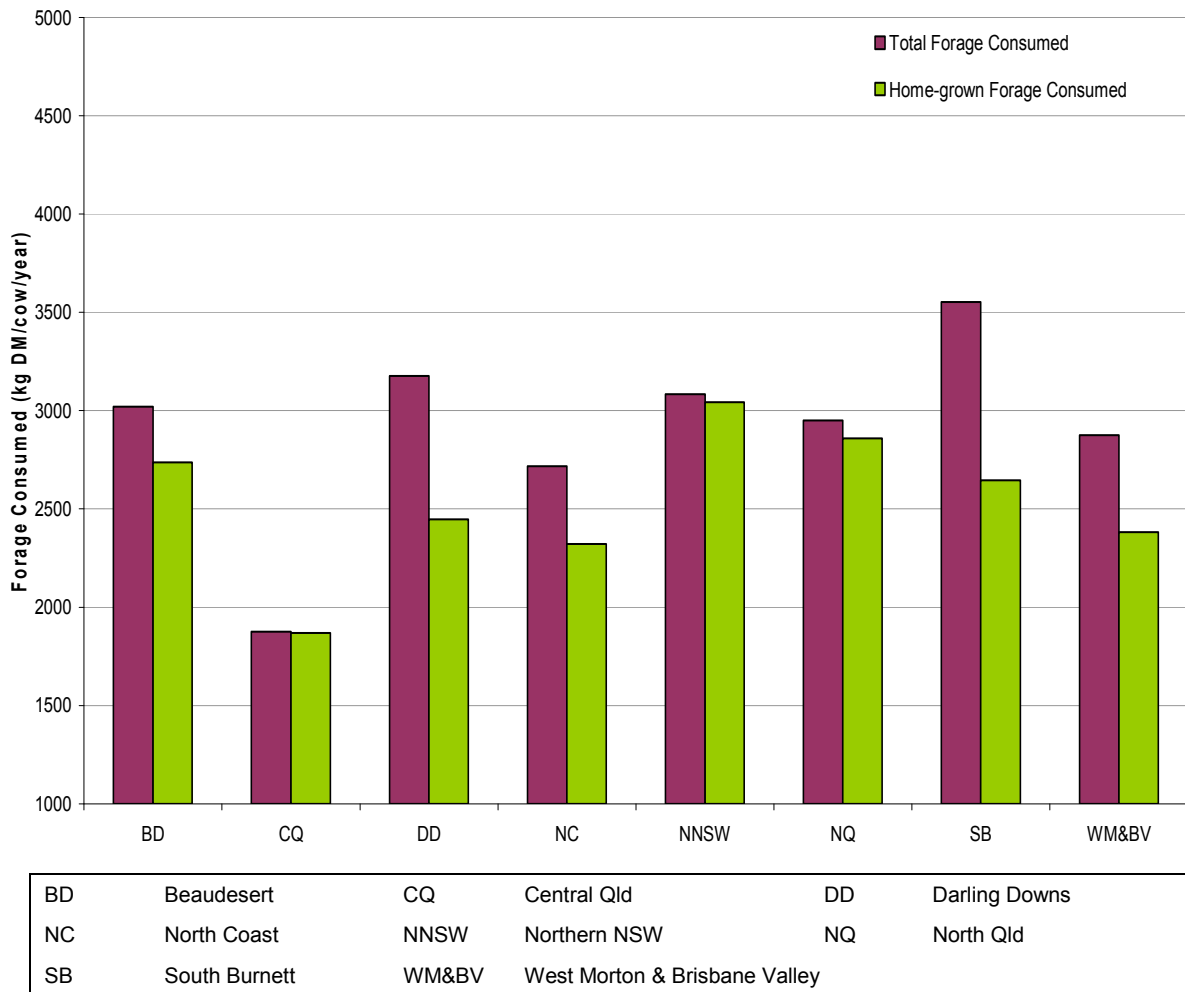


Figure 7. Forage consumed per cow in 2007 on farms in the Northern dairy region



5. Other Results

5.1 Calculating total production costs

QDAS reports clearly indicate if they are compiled on a cash or profit basis. These terms are often misused in general discussions.

When calculating profit the following non-cash items are included:

- Adjustments to the purchased and home grown feed stocks
- Plant depreciation
- An allowance for unpaid labour (Imputed labour)
- Consideration is given to the opening and closing cattle inventory, sales and purchases to arrive at the cattle trading profit.

There was very little difference in the price received for milk between the groups. The variation in receipts came from cattle trading profit and other dairy related receipts. Farms in the top group produced milk 2.0 c/L cheaper.

Profit maps showing the QDAS results for the top 25% of farms and the average farm in 2007 are

included as Appendix 6. The maps show how QDAS calculates profit; this format compiles with benchmarking guidelines and accepted accounting principles.

If the return on asset is below the benchmark or target set for your farm, it is simply a matter of tracing back up the map to isolate the areas where your result differs from your predetermined target and formulating a plan to correct the problem area.

Most of the calculations in the profit maps are in total dollars and c/L, but by dividing the total dollars by the number of milkers or labour units; a value per cow or per labour unit can be obtained.

Tables 16 and 17 show the cost as determined in a profit analysis and also the production cost on a cash basis for 2006-2007.

Farm production of the two groups was 1.17 million litres on the average farm, and 1.01 million litres on the top farms.

Table 16. Production costs on QDAS farms – profit analysis (2006–2007)

Profit analysis	Average	Top 25% farms
Total dairy receipts (c/L) ⁽¹⁾	43.9	49.4
Total variable cost (c/L)	28.1	26.1
Administration costs (c/L)	2.7	2.4
Paid labour costs (c/L)	3.6	3.6
Imputed labour (c/L) ⁽²⁾	3.9	4.3
Depreciation costs (c/L)	2.1	2.0
Finance costs (c/L)	3.2	3.2
Total production costs (c/L)	43.6	41.6

⁽¹⁾ Total dairy receipts in a profit analysis include milk income, cattle trading profit and HGF & purchased feed changes, rebates and drought payments.

⁽²⁾ The imputed labour cost is calculated using the formula shown in Table 20.

Table 17. Production costs for QDAS farms – cash analysis (2006–2007)

Cash analysis	Average	Top 25% farms
Total dairy receipts (c/L) ⁽³⁾	45.4	48.1
Total variable cost (c/L)	28.1	26.1
Administration costs (c/L)	2.7	2.4
Paid labour costs (c/L)	3.6	3.6
Principal + interest payments (c/L)	4.7	4.6
Living expenses (c/L) ⁽⁴⁾	4.6	5.3
Total production costs (c/L) ⁽⁵⁾	43.7	42.0

⁽³⁾ Total farm receipts include milk income, stock sales, produce sales, rebates and drought payments.

⁽⁴⁾ \$54,000 was used as the living expense.

⁽⁵⁾ No capital expenditure is shown in this analysis.

5.2 Capital/financial efficiency

This year 3 KPI are presented, asset turnover ratio (ATO), total liabilities and interest expressed as dollars per cow.

Asset turnover ratio (ATO) is the measure of capital efficiency used in QDAS. It measures the income generated per dollar invested. The formula used in the analysis is:

ATO = Total dairy income (milk income + cattle trading profit + inventory changes + rebates & drought payments) ÷ asset value.

The average ATO value for cooperating farms in 2006-2007 was 0.16, while the top farms averaged 0.18 for each dollar invested. In 2003-04 farms averaged 0.23. On average the 2006-07 result means that 16 cents was generated from each dollar invested.

Asset valuation plays a critical part in the above formula. An increase in asset value will impact positively on net worth but negatively on the ATO and operational return on assets calculation. Also, the low investment in cattle due to the income generating asset is low in proportion to the total asset value.

Table 18 shows the asset value and breakdown of the components for the dairy regions. Where farms have a number of sub-divided portions of land, values increase dramatically.

There are several critical questions to address when reviewing capital efficiency.

- How can revenue be increased economically as the KPI to measure asset turnover does not consider the cost structure?
- Would relocation be an option for QDAS farms located in areas where land valuations are high? Farmers have been reluctant to relocate.
- What would be the impact of leasing additional land versus ownership, contracting land preparation versus ownership of plant? Contract rearing of stock is not popular at present. It is not traditional in Queensland to lease large areas of productive land.

While equity on farms is strong, it can be driven by land values if debt is not increased markedly.

The average debt per cow was \$2,182 while interest paid was \$184. These numbers are within realistic financial targets.

Table 18. Land, plant and stock valuations for QDAS dairy farms (2006–2007)

	SEQ		NQ		NNSW	
Land & buildings (\$)	2,108,114	76.9%	3,269,114	77.9%	2,030,634	73.0%
Stock (\$)	243,557	8.9%	383,118	9.1%	290,111	10.4%
Plant (\$)	199,951	7.3%	246,678	5.9%	263,829	9.5%
Other (\$) ⁽¹⁾	190,060	6.9%	295,220	7.1%	195,822	7.1%
TOTAL (\$)	2,741,683	100%	4,194,131	100%	2,780,397	100%
Investment per milking cow (\$)	14,900		14,266		12,696	

⁽¹⁾ Other includes value of shares, FMD's, PDA, feed inventories, and cash.

5.3 Administration costs

Administration includes the following costs: accountancy, rates, registration of farm vehicles, insurance, telephone and associated office expenses, repairs to permanent improvements and membership of professional organisations. The average administration cost across all 119 farms in QDAS was \$32,424, 2.7 c/L, or \$153 per cow. Because NQ farms had higher repair costs to structures due to the recent cyclone, these farms are not included in the table below.

Administration is a fixed expense and while the dollar figure increases, the costs get proportionately lower per litre and per cow as farms expand production (Table 19).

Table 19. Administration costs for farms with increasing annual production (2006-2007)

Annual production	<750,000 L	750,000 –1.25 m L	1.25-2.0 m L	>2.0 m L
Farm production (L)	526,002	948,358	1,473,163	2,131,893
Administration (\$)	17,815	24,865	37,733	48,023
Administration (s/cow)	181	188	140	125
Administration (c/L)	3.2	2.5	2.3	1.8

5.4 Labour resources

The average milk production per labour unit across all QDAS farms was 424,848. Labour information, paid labour plus the opportunity cost of the owners/managers labour is summarised in Table 21 for 4 production groups.

There was a wide range in labour productivity:

- 36 % of farms produced less than 350,000 litres per labour unit
- 24 % between 350 & 450,000 litres
- 21 % between 451 and 550,000 litres
- 23 % in excess of 550,000 litres

The number of labour units contributing to the milk production was recorded under the following two headings:

- Unpaid permanent labour – the farm owners
- Paid labour – casual and permanent.

Paid labour costs include superannuation contributions, taxation and workers compensation payments. The process for calculating imputed labour is outlined in Table 20.

An estimate of the actual hours of unpaid labour used on each farm was recorded in 2006-2007. This is usually the contribution by the farm owners – husband and wife. An analysis of this data found the following characteristics.

- The hours of unpaid labour recorded ranged from zero (for farms where all workers were paid a wage, including the owners) up to a maximum of 15,000 hours for the year (where five unpaid people were involved).
- The average of unpaid labour per farm was 5,206 hours, which represents approximately \$78,085 per year if this labour was paid \$15 per hour.

- By comparing the hours of unpaid labour with the number of full time people working on the farm, it can be determined that on average a full time unpaid person works 3,143 hours per year. This represents 8.6 hours every day of the year. Typically this is could be reflected as 9 hours on Monday to Saturday, 7.6 hours on Sunday and one week per year not involved in farm work.

Labour costs are the second biggest production cost after feed. Depending on the method used to calculate the labour cost, the average farm producing 1.17 million litres, would incur a cost of 7.6 or 10.3 c/L, \$423 or \$573 per cow. The higher figure is obtained when costing unpaid labour at \$15 per hour. It may also be realistic to add an additional 1-2 c/L for unpaid labour to take account of the varying farm size.

Labour, lifestyle and succession are important issues for families and the industry to debate.

Table 20. Imputed labour / management allowance calculation (2006-2007)

Farm production	Management allowance
Where production is less than 300,000 L	\$20,000
Where production is between 300,000 & 900,000 L	6 c/L
Where production exceeds 900,000 L	\$54,000

Large farms would now have to pay more than \$54,000 for a competent manager.

Table 21. Regional labour statistics (2006-2007)

Farm production	No of units unpaid + paid labour	\$ Cost * Imputed cost + paid labour	\$ Cost ** owners labour paid on hourly basis + paid labour
<750,000 L	1.6 + 0.3	32,077 + 11,607 = 43,684	68,150 + 11,607 = 79,757
750,000 - 1.25 mL	1.6 + 0.8	52,845 + 30,645 = 83,490	79,772 + 30,645 = 110,417
1.25 mL – 2.0 mL	1.8 + 1.7	54,000 + 63,659 = 117,659	85,190 + 63,659 = 148,849
>2.0 mL	1.8 + 2.8	54,000 + 138,580 = 182,580	89,149 + 138,580 = 227,729

* Imputed cost is calculated using the data in Table 20, and shows no additional allowance for milking a large herd

** Unpaid labour cost is calculated by hours worked paid at \$15/hr

6. Appendices

- 6.1 Map of farm performance – Top 25% of farms (2006-2007)
- 6.2 Group cash gross margin – Top 25% of farms (2006-2007)
- 6.3 Map of farm performance – All 119 QDAS farms (2006-2007)
- 6.4 Group cash gross margin – All 119 QDAS farms (2006-2007)
- 6.5 Group cash gross margin – South-east Queensland farms (excluding the Darling Downs) (2006-2007)
- 6.6 Group cash gross margin – Darling Downs farms (2006-2007)
- 6.7 Group cash gross margin – North Queensland farms (2006-2007)
- 6.8 Group cash gross margin – Northern New South Wales farms (2006-2007)
- 6.9 Definitions of business traits and key performance indicators used

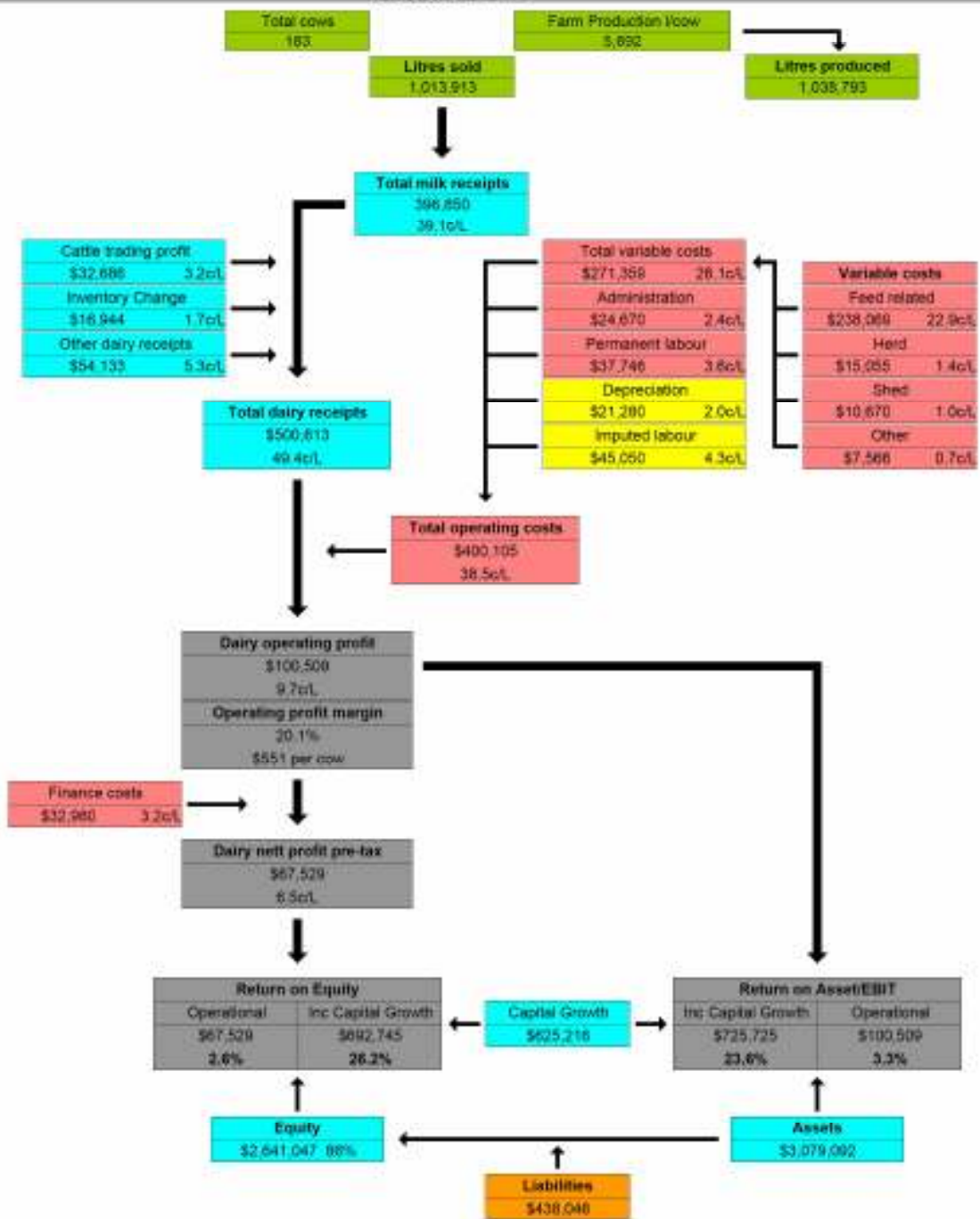
6.1 Map of farm performance – Top 25% of farms (2006–2007)

Queensland Dairy Accounting Scheme

Group dairy farm profit map

Year: 2007

Top 25%
Group of 30 farms



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Asset and liability values are the average of opening and closing values for this year
Note: Imputed Labour is litre based

6.2 Group cash gross margin – Top 25% of farms (2006–2007)

Queensland Dairy Accounting Scheme			
Group cash gross margin			Period ending 6/2007
Top 25%			

Receipts	Cents/litre	Dollars/cow	Total \$ earned	
Milk	36.0	2,000.88	365,160	
Milk bonuses/incentives/rebates/other	3.1	173.64	31,690	
Milk Receipts (1,013,913 l)	39.1	2,174.52	396,850	
Stock sales - dairy	3.5	191.79	35,003	
Stock sales - other	0.1	7.48	1,381	
Produce sales	0.0	0.15	28	
Other receipts	5.3	298.62	54,133	
Non-milk receipts	8.9	496.03	90,525	
Total farm receipts	48.1	2,670.55	487,375	
Production costs	Cents/litre	Dollars/cow	% Milk income	Total \$ spent
Purchased feeds	14.6	833.51	38.3	152,116
Fertiliser	2.5	140.40	6.5	25,623
Fuel & oil	1.2	70.24	3.2	12,818
Seed	0.8	34.78	1.6	6,348
Irrigation costs	0.8	34.86	1.6	6,362
Repairs & maintenance	1.9	105.53	4.0	19,250
Other feed costs	1.5	85.16	1.5	15,542
Feed related costs	22.9	1,304.49	60.0	238,069
Margin over feed related costs	15.3	870.03	40.0	158,781
Animal health	0.9	53.70	2.5	9,801
Herd improvement	0.5	26.79	1.3	5,254
Herd costs	1.4	82.49	3.8	15,055
Dairy shed costs - electricity	0.6	32.15	1.5	5,868
Dairy shed costs - chemicals	0.5	26.31	1.2	4,802
Shed costs	1.0	58.46	2.7	10,670
Cartage	0.2	12.98	0.6	2,369
Levies	0.3	17.15	0.8	3,130
Sundry variable costs	0.2	11.33	0.5	2,067
Other variable costs	0.7	41.46	1.9	7,566
Total variable costs	26.1	1,486.90	68.4	271,359
Gross margins - milk only	12.1	687.62	31.6	125,491
- whole farm	20.8	1,183.65	54.4	216,016
Permanent wages	3.6	206.83	9.5	37,746
Personal drawings etc	2.0	113.66	5.2	20,743

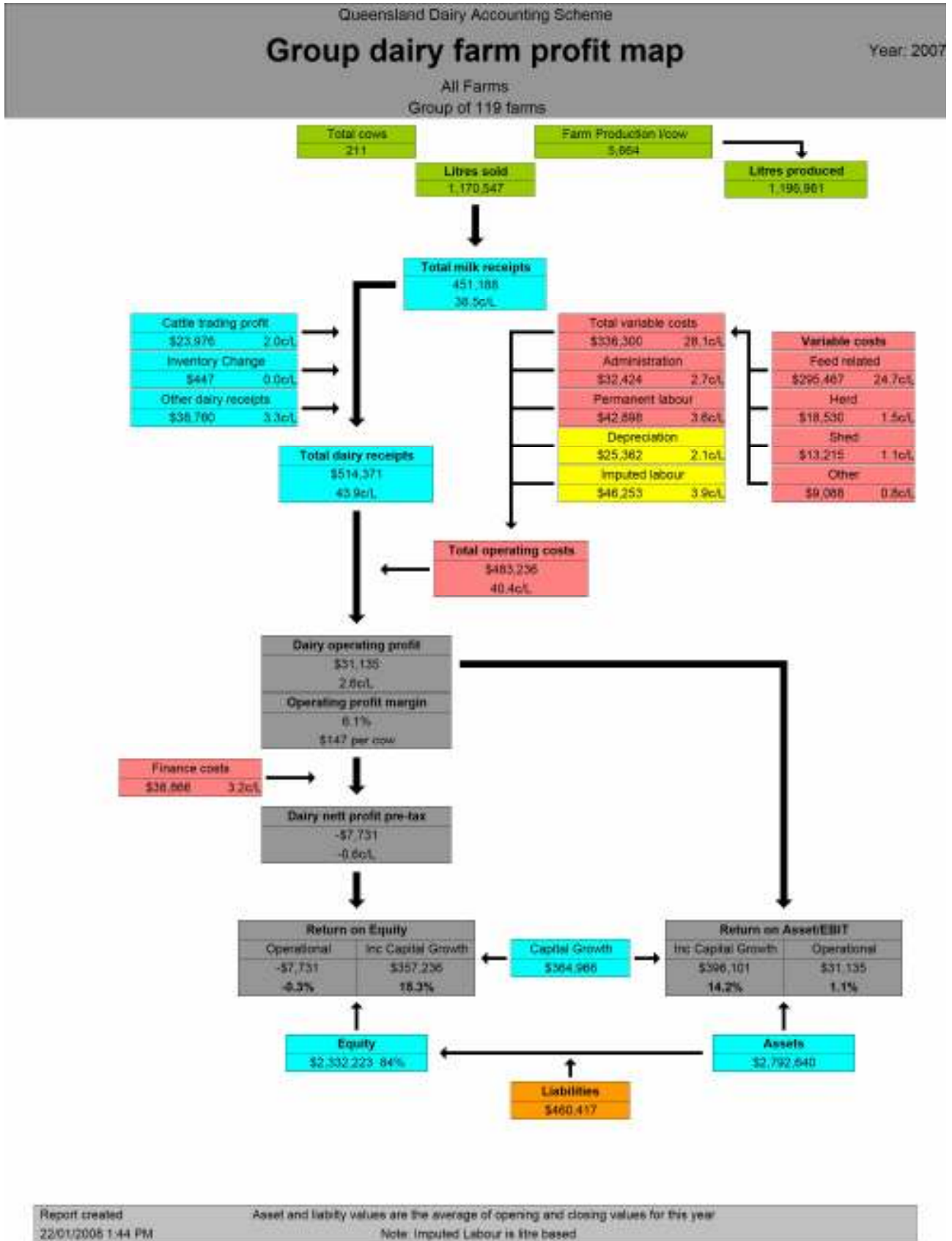
Labour inputs	Areas (ha)	Stock	Production					
Permanent unpaid	1.6	Milking cow	117	Milking and Dry Cows	183	Fed to calves (L)	24,881	2%
Permanent paid	1.0	Effective dairy	224	Mated heifers	31	Protein total (kg)	32,642	3.22%
Casual paid	0.0	Irrigation	26	Other heifers	78	Butterfat total (kg)	39,899	3.94%
Imputed (38 hr/wk)	3.5			Adult equivalents	230	Milk solids (kg)	72,541	
						Litres / cow	5,692	
						Milk solids / cow (kg)	397	

Farms in report 30

Total Operating Costs	\$400,105
Dairy Operating Surplus (EBIT)	\$100,509
ROA (Operational)	3.3%
Asset value	\$3,079,092
Equity	86%

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6.3 Map of farm performance – All 119 QDAS farms (2006–2007)



6.4 Group cash gross margin – All 119 QDAS farms (2006–2007)

Queensland Dairy Accounting Scheme			
Group cash gross margin			Period ending 6/2007
All Farms			

Receipts	Cents/litre	Dollars/cow		Total \$ earned
Milk	38.1	1,999.06		422,490
Milk bonuses/incentives/rebates/other	2.5	135.79		28,698
Milk Receipts (1,170,547 l)	38.5	2,134.85		451,188
Stock sales - dairy	3.2	179.66		37,970
Stock sales - other	0.2	11.13		2,352
Produce sales	0.1	6.99		1,476
Other receipts	3.3	183.40		38,760
Non-milk receipts	6.9	381.18		80,560
Total farm receipts	45.4	2,516.02		531,748
Production costs	Cents/litre	Dollars/cow	% Milk income	Total \$ spent
Purchased feeds	16.1	911.54	42.7	192,649
Fertiliser	2.4	136.61	6.4	28,872
Fuel & oil	1.3	74.07	3.5	15,653
Seed	0.9	46.19	2.3	10,166
Irrigation costs	0.8	31.88	1.5	8,738
Repairs & maintenance	1.5	86.95	4.1	18,377
Other feed costs	1.9	108.79	1.9	22,993
Feed related costs	24.7	1,398.04	65.5	295,467
Margin over feed related costs	13.0	736.81	34.5	155,721
Animal health	1.0	54.92	2.6	11,607
Herd improvement	0.6	32.76	1.5	6,923
Herd costs	1.5	87.68	4.1	18,530
Dairy shed costs - electricity	0.6	32.29	1.5	6,824
Dairy shed costs - chemicals	0.5	30.24	1.4	6,391
Shed costs	1.1	62.53	2.9	13,215
Cartage	0.3	14.72	0.7	3,110
Levies	0.3	17.51	0.8	3,701
Sundry variable costs	0.2	10.77	0.5	2,277
Other variable costs	0.8	43.00	2.0	9,088
Total variable costs	28.1	1,591.24	74.5	336,300
Gross margins - milk only	9.6	543.61	25.5	114,888
- whole farm	16.3	924.78	43.3	195,448
Permanent wages	3.6	202.98	9.5	42,898
Personal drawings etc	2.4	133.40	6.2	28,192

Labour inputs	Areas (ha)	Stock	Production					
Permanent unpaid	1.7	Milking cow	108	Milking and Dry Cows	211	Fed to calves (L)	26,414	2%
Permanent paid	1.1	Effective dairy	208	Mated heifers	37	Protein total (kg)	37,659	3.22%
Casual paid	0.0	Irrigation	25	Other heifers	96	Butterfat total (kg)	46,329	3.96%
Imputed (38 hr/wk)	3.7			Adult equivalents	269	Milk solids (kg)	83,989	
						Litres / cow	5,664	
						Milk solids / cow (kg)	397	

Farms in report 119

Total Operating Costs	\$483,236
Dairy Operating Surplus (EBIT)	\$31,135
ROA (Operational)	1.1%
Asset value	\$2,792,640
Equity	84%

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6.5 Group cash gross margin – South-east Queensland excluding the Darling Downs (2006–2007)

Queensland Dairy Accounting Scheme			
Group cash gross margin			Period ending 6/2007
South East QLD Farms (excluding Darling Downs)			

Receipts	Cents/litre	Dollars/cow		Total \$ earned
Milk	37.7	2,139.83		445,887
Milk bonuses/incentives/rebates/other	2.7	150.93		31,451
Milk Receipts (1,182,222 l)	40.4	2,290.76		477,338
Stock sales - dairy	3.3	187.28		39,027
Stock sales - other	0.1	3.72		775
Produce sales	0.1	5.35		1,115
Other receipts	1.9	110.05		22,932
Non-milk receipts	5.4	306.41		63,849
Total farm receipts	45.8	2,597.18		541,187
Production costs	Cents/litre	Dollars/cow	% Milk income	Total \$ spent
Purchased feeds	17.0	983.80	42.9	204,999
Fertiliser	2.0	116.92	5.1	24,362
Fuel & oil	1.3	77.06	3.4	16,057
Seed	0.6	35.45	1.5	7,387
Irrigation costs	0.8	47.91	2.1	9,983
Repairs & maintenance	1.6	92.54	4.0	19,282
Other feed costs	1.4	82.68	1.4	17,229
Feed related costs	24.8	1,436.35	62.7	299,299
Margin over feed related costs	14.7	854.42	37.3	178,039
Animal health	1.0	60.19	2.6	12,543
Herd improvement	0.5	26.18	1.2	5,672
Herd costs	1.5	88.38	3.9	18,415
Dairy shed costs - electricity	0.5	29.31	1.3	6,107
Dairy shed costs - chemicals	0.5	26.13	1.1	5,445
Shed costs	1.0	55.44	2.4	11,552
Cartage	0.3	15.61	0.7	3,252
Levies	0.3	18.66	0.8	3,892
Sundry variable costs	0.2	9.77	0.4	2,035
Other variable costs	0.8	44.05	1.9	9,179
Total variable costs	28.0	1,624.21	70.9	338,445
Gross margins - milk only	11.5	666.55	29.1	138,893
- whole farm	16.8	972.97	42.5	202,742
Permanent wages	4.2	243.13	10.6	50,663
Personal drawings etc	1.7	99.02	4.3	20,633

Labour inputs	Areas (ha)	Stock	Production					
Permanent unpaid	1.5	Milking cow	80	Milking and Dry Cows	208	Fed to calves (L)	25,163	2%
Permanent paid	1.2	Effective dairy	166	Mated heifers	38	Protein total (kg)	38,275	3.24%
Casual paid	0.0	Irrigation	35	Other heifers	87	Butterfat total (kg)	46,073	3.97%
Imputed (38 hr/wk)	3.8			Adult equivalents	294	Milk solids (kg)	85,248	
						Litres / cow	5,794	
						Milk solids / cow (kg)	408	

Farms in report 40

Total Operating Costs	\$481,737
Dairy Operating Surplus (EBIT)	\$34,337
ROA (Operational)	1.2%
Asset value	\$2,846,840
Equity	88%

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6.7 Group cash gross margin – North Queensland (2006–2007)

Queensland Dairy Accounting Scheme			
Group cash gross margin			Period ending 6/2007
North Queensland Farms			

Receipts	Cents/litre	Dollars/cow		Total \$ earned
Milk	32.2	1,713.33		503,952
Milk bonuses/incentives/rebates/other	3.6	193.44		56,899
Milk Receipts (1,565,460 l)	35.8	1,906.77		560,851
Stock sales - dairy	2.5	131.91		38,800
Stock sales - other	0.2	10.50		3,088
Produce sales	0.0	0.00		0
Other receipts	5.7	300.80		88,475
Non-milk receipts	8.3	443.20		130,363
Total farm receipts	44.2	2,349.98		691,214
Production costs	Cents/litre	Dollars/cow	% Milk income	Total \$ spent
Purchased feeds	14.1	766.69	40.2	225,512
Fertiliser	3.2	172.49	9.0	50,734
Fuel & oil	1.0	56.42	3.0	16,596
Seed	0.6	35.09	1.8	10,321
Irrigation costs	0.4	23.73	1.2	8,980
Repairs & maintenance	1.8	88.07	4.6	25,908
Other feed costs	2.0	108.73	2.0	31,982
Feed related costs	23.0	1,251.23	65.6	368,031
Margin over feed related costs	12.1	655.55	34.4	192,820
Animal health	1.2	64.07	3.4	18,845
Herd improvement	0.7	35.31	1.9	10,386
Herd costs	1.8	99.38	5.2	29,231
Dairy shed costs - electricity	0.6	30.97	1.6	9,110
Dairy shed costs - chemicals	0.5	27.91	1.5	8,211
Shed costs	1.1	58.89	3.1	17,321
Cartage	0.2	12.45	0.7	3,663
Levies	0.3	15.64	0.8	4,599
Sundry variable costs	0.2	9.64	0.5	2,834
Other variable costs	0.7	37.73	2.0	11,097
Total variable costs	26.7	1,447.22	75.9	425,679
Gross margins - milk only	8.5	459.56	24.1	135,173
- whole farm	16.6	902.76	47.3	265,535
Permanent wages	3.9	212.27	11.1	62,437
Personal drawings etc	2.1	116.07	6.1	34,142

Labour inputs	Areas (ha)	Stock	Production					
Permanent unpaid	1.7	Milking cow	119	Milking and Dry Cows	294	Fed to calves (L)	31,403	2%
Permanent paid	1.3	Effective dairy	234	Mated heifers	41	Protein total (kg)	49,142	3.14%
Casual paid	0.1	Irrigation	32	Other heifers	131	Butterfat total (kg)	59,415	3.80%
Imputed (38 hr/wk)	4.2			Adult equivalents	366	Milk solids (kg)	108,556	
						Litres / cow	5,429	
						Milk solids / cow (kg)	369	

Farms in report 22

Total Operating Costs	\$603,719
Dairy Operating Surplus (EBIT)	\$89,857
ROA (Operational)	2.5%
Asset value	\$3,641,753
Equity	80%

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6.8 Group cash gross margin – Northern New South Wales (2006–2007)

Queensland Dairy Accounting Scheme			
Group cash gross margin			Period ending 6/2007
Northern NSW Farms			

Receipts	Cents/litre	Dollars/cow		Total \$ earned
Milk	38.1	2,000.50		437,696
Milk bonuses/incentives/rebates/other	0.3	13.28		2,906
Milk Receipts (1,150,309 l)	38.3	2,013.78		440,601
Stock sales - dairy	2.9	151.12		33,064
Stock sales - other	0.5	28.00		6,126
Produce sales	0.4	18.82		4,117
Other receipts	2.5	128.96		28,215
Non-milk receipts	6.2	326.89		71,521
Total farm receipts	44.5	2,340.67		512,122
Production costs	Cents/litre	Dollars/cow	% Milk income	Total \$ spent
Purchased feeds	14.6	787.19	39.1	172,232
Fertiliser	3.1	169.62	8.4	37,112
Fuel & oil	1.1	60.61	3.0	13,261
Seed	1.4	75.97	3.8	18,623
Irrigation costs	0.3	15.95	0.8	3,490
Repairs & maintenance	1.3	70.71	3.5	15,472
Other feed costs	2.4	127.66	2.4	27,930
Feed related costs	24.2	1,307.72	64.9	286,120
Margin over feed related costs	13.1	706.06	35.1	154,481
Animal health	0.9	47.59	2.4	10,412
Herd improvement	0.8	42.91	2.1	9,388
Herd costs	1.7	90.50	4.5	19,800
Dairy shed costs - electricity	0.7	37.00	1.8	8,096
Dairy shed costs - chemicals	0.8	41.92	2.1	9,173
Shed costs	1.5	78.93	3.9	17,269
Cartage	0.2	13.03	0.6	2,850
Levies	0.3	16.13	0.8	3,530
Sundry variable costs	0.2	13.15	0.7	2,877
Other variable costs	0.8	42.31	2.1	9,257
Total variable costs	28.1	1,519.45	75.5	332,446
Gross margins - milk only	9.2	494.33	24.5	108,155
- whole farm	15.2	821.22	40.8	179,676
Permanent wages	3.3	176.77	8.8	38,677
Personal drawings etc	3.7	201.06	10.0	43,991

Labour inputs	Areas (ha)	Stock	Production					
Permanent unpaid	1.8	Milking cow	86	Milking and Dry Cows	218	Fed to calves (L)	31,072	3%
Permanent paid	1.1	Effective dairy	156	Mated heifers	38	Protein total (kg)	37,406	3.25%
Casual paid	0.0	Irrigation	7	Other heifers	98	Butterfat total (kg)	46,296	4.02%
Imputed (38 hr/wk)	3.8			Adult equivalents	278	Milk solids (kg)	83,704	
						Litres / cow	5,400	
						Milk solids / cow (kg)	383	

Farms in report 29

Total Operating Costs	\$499,804
Dairy Operating Surplus (EBIT)	-\$12,975
ROA (Operational)	-0.5%
Asset value	\$2,682,263
Equity	83%

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6.9 Business traits, key performance indicators and definitions

Sixteen key performance indicators (KPI) are used in QDAS to monitor farm performance. Table 22 shows these indicators grouped under the three key business trait headings:

- Solvency
- Profitability
- Efficiency

A further business trait, liquidity, is essentially to measuring a business' ability to meet short term debts. QDAS does not report on this business trait as it concentrates its efforts into the longer term business traits.

Why use KPI

Put simply, KPI are calculations used for measurement, comparison and evaluation. Their use eliminates many simple dollar value comparisons, which can often be misleading and confusing. They can also be used to identify problems and opportunities.

Table 22. Key performance indicators used in QDAS

<p>Profitability</p> <ul style="list-style-type: none"> • Return on asset (RoA) operational – % • Return on equity (RoE) operational – % • Operating profit margin (OPM) – % • Dairy operating profit (DOP) –\$/cow <p>Solvency</p> <ul style="list-style-type: none"> • Equity% – % • Debt to equity ratio <p>Efficiency</p> <ul style="list-style-type: none"> • Asset turnover ratio (ATO) • Total liabilities per cow – \$/cow • Interest per cow – \$/cow • Feed related cost (FRC) – c/L • Margin over feed related costs (MOFRC) – \$/cow • Total variable cost (TVC) – c/L • Gross margin milk (GM) – \$/cow • Litres of milk from home grown feed (L/HGF) – L • Production per cow (PPC) – L • Litres per labour unit (LLU) – L

Profitability KPI used in QDAS

Profitability ratios measure the ability of the business manager to generate a satisfactory profit. These ratios are typically a good indicator of management's overall effectiveness in producing milk from the land and stock.

Return on Asset (RoA) - operational

The KPI, RoA operational measures the profit-generating capacity of the total assets of the business. It measures the farm's effectiveness in using the available total capital, both debt and equity. This does not include any capital (land and improvements) appreciation.

Calculation

$(\text{Dairy operating profit} \div \text{Total assets}) * 100.$

Return on Asset (RoA) – including capital appreciation

The KPI, RoA including capital appreciation, measures the profit-generating capacity of the total assets of the business including the growth in the value of these assets. When large companies such as BHP report a RoA, they include the growth in the value of their assets.

Calculation

$((\text{Dairy operating profit} + \text{increase in the value of land and improvements}) \div \text{Total assets}) * 100.$

Return on equity (RoE) - operational

This KPI measures the return on the owner's investment in the business (not including any appreciation in the value of land or improvements). Interest costs are deducted from the operating profit to make the calculation. It takes the investor's point of view and can be a good way to encourage further investment in a business; it also allows a comparison to be made with the returns available from external investments.

Calculation

$(\text{Dairy net profit (pre tax)} \div \text{Equity}) * 100$

Return on equity (RoE) - including capital appreciation

This KPI takes the RoE operational, discussed above, and adds in the appreciation in the value of land and improvements.

Calculation

$((\text{Dairy net profit (pre tax)} + \text{increase in the value of land and improvements}) \div \text{Equity}) * 100$

Operating profit margin

This calculation highlights the amount of profit retained after all expenses are paid except debt servicing and taxation payments. It is a measure of the effectiveness of operations to generate and retain profits from revenues. Depreciation and a management allowance are included as expenses in this profit KPI.

Calculation

$(\text{Dairy operating profit} \div \text{total dairy income}) * 100.$

Dairy operating profit per cow

Similar to the above calculation but is expressed as dollars per cow.

Calculation

$(\text{Dairy operating profit} \div \text{Number of milkers}) * 100.$

Solvency KPI used in QDAS

Solvency ratios indicate how the business is financed, eg by owners equity or by external debt. Lenders of long-term funds and equity investors have an interest in solvency ratios. They can highlight:

- Possible problems for the business in meeting its long-term obligations
- Show how much of the business's capital is provided by lenders versus owners
- The asset liability statement will indicate to the lenders the potential risks in the recovery of their money
- The potential amount of long-term funds that a business can borrow.

This KPI is often referred to as the 'sleep at night' factor – how comfortable do you feel with the current debt level?

Equity%

Lenders see an increased risk associated with borrowing as this %age figure falls below a predetermined or agreed figure. To assess the risk potential it is important to look at both the debt and the business cash flow.

Calculation

$((\text{Assets} - \text{Liabilities}) / \text{Assets}) * 100.$

Debt to equity ratio

This is another way of expressing equity.

Calculation

$\text{Average Liabilities} \div \text{average net worth}.$

Efficiency KPI used in QDAS

When examining a business these KPI are often the starting point in an analysis, however it is recommended that the emphasis should be on the first three business traits. Efficiency ratios show how well business resources are being used to achieve other KPI.

Asset turnover ratio (ATO)

This measures the amount of revenue generated per dollar of assets invested. It is a measure of the manager's effectiveness to generate revenues (capital efficiency). The calculation does not include any costs.

Calculation

$\text{Total dairy income} \div \text{Assets}.$

Total liabilities (debt) per milker

A high value could indicate potential difficulties with both liquidity and solvency.

Calculation

$\text{Liabilities} \div \text{Number of milkers}.$

Interest per milker

The total amount of dollars being paid in interest per cow is used to highlight one risk aspect for the business. Generally farms in a rapid development phase will have a higher figure than well established businesses.

Calculation

$\text{Total interest payments} \div \text{Number of milkers}$

Feed related cost (FRC)

FRC is a variable cash cost and includes purchased as well as all home grown feed input costs.

Calculation

$\text{Total of all feed related costs} \div \text{Total production}.$

Margin over feed related costs (MOFRC)

Only the gross milk income is used in this calculation, this avoids the fluctuations that occur in annual cattle sales.

Calculation

$(\text{Gross milk income} - \text{FRC}) \div \text{Number of milkers}$.

Total variable cost (TVC)

In QDAS total variable costs are compiled under four headings – FRC, herd, shed and other variable costs.

Calculation

$\text{TVC} \div \text{Total production}$.

Milk gross margin (GM)

This highlights the milk production efficiency; the resulting dollars are available to pay fixed, financial, living and future development costs. It should not be confused with the profit KPI.

Calculation

$(\text{Milk income} - \text{TVC}) \div \text{Number of milkers}$.

Litres of milk from home grown feed

Home grown forage (HGF) includes grazed pasture, home produced hay and silage. QDAS uses milk conversion factors to calculate the milk from all feed sources including concentrates.

Calculation

The milk from HGF is expressed as litres per milker per day.

Production per cow

In QDAS the milking cow numbers used in all calculations includes milkers plus dry cows. This implies each cow has a calf annually.

Calculation

$\text{Total milk production} \div \text{Number of milkers}$.

Litres per labour unit

The inference is made that as margins have reduced, technology should be used to gain efficiency. The number of cows milked per labour unit will impact on profitability.

Calculation

$\text{Total litres of milk} \div \text{Number of labour units (paid + unpaid)}$.

General comments

Many of these 16 KPI are representative of KPI that are used in most business reporting. A great number of additional KPI can be calculated from the vast amount of data collated in QDAS if and when required.

Other measures are important when examining an individual plan especially liquidity traits eg. cash surpluses. Environmental KPI and other sustainability considerations are also important.

The change in net worth is also an important indicator for every farm owner, and should be calculated regularly.