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Balancing dairy production and profits in Northern Australia

QDAS Financial and production trends – 2008

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.

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Introduction

This report contains physical and financial data from 89 farms and includes data from all Queensland dairy regions. Queensland farms are all located in what is called the Northern Australia dairy region, and the region receives funding from Subtropical Dairy.

It is estimated that Queensland produced approximately 485 million litres of milk from 630 farms in 2007–2008. The number of dairy farms is gradually declining. The table below shows the trend in milk supply and farm numbers for Queensland over the last three years.

Table 1. Dairy farm numbers and annual production for Queensland (2005-06 to 2007-08)

	Farms	Annual production
2007-08	630	485 mL
2006-07	734	534 mL
2005-06	802	597 mL

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 67 farms that have contributed data over four continuous years. Analysis of their data gives an accurate reflection of changes in the Queensland dairy industry on these farms.

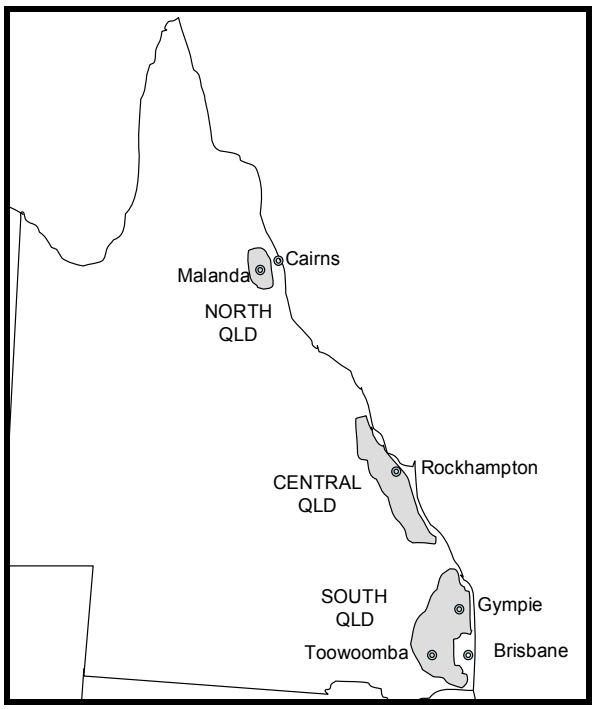
Section 4 details the characteristics of the most profitable farms in QDAS. Production per cow, the effect of herd size and production from home grown feed are aspects examined.

Farming system statistics are presented for the first time in Section 5 and the appendices include gross margins for total mixed rations (TMR), partial mixed rations (PMR) and grazing system farms.

In Section 6, the cost of production calculated in cash and on a profit basis, as well as capital efficiency, administration costs and labour are detailed.

Other 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 Queensland



What's New

A report on the KPI of total mixed ration, partial mixed ration and grazing farms in south Queensland (section 5).

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, Darling Downs, South Burnett and North Queensland. 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 profitability, solvency 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 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 Queensland average.

Acknowledgements

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Graeme J. Busby
Project Leader

Queensland Dairy Accounting Scheme
Department of Primary Industries and Fisheries
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1. 2007–2008 Key findings

Sixteen Key Performance Indicators (KPI) are used to highlight the results for profitability, solvency and efficiency. Table 2 shows these results for 2007-08 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 (2004-05 to 2007-08)

Business traits and indicators[1]	**Top 25%**	**QDAS average**	**Past QDAS averages**		
Profitability	**2007-08**	**2007-08**	**2006-07**	**2005-06**	**2004-05**
Return on assets - operational (%)	15.3	10.3	1.1	3.0	3.3
Return on equity - operational (%)	16.8	10.7	-0.3	1.9	2.3
Operating profit margin (%)	47.5	27.8	6.1	15.0	16.0
Dairy operating profit ($/cow)	2,640	1,605	147	362	357
Solvency					
Equity (%)	84	83	84	84	83
Debt to equity ratio	0.20	0.20	0.20	0.19	0.22
Efficiency – Capital/Finance					
Asset turnover ratio	0.32	0.27	0.18	0.20	0.22
Total liabilities per cow ($)	2,836	2,598	2,182	1,898	1,841
Interest paid/cow ($)	207	212	184	174	154
Efficiency – Productivity					
Feed related costs (c/L)	29.2	30.2	24.7	20.4	19.8
Margin over feed related costs ($/L)	24.5	21.1	13.0	15.3	14.4
Total variable costs (c/L)	32.3	33.7	28.1	23.9	23.1
Gross margin - milk ($/cow)	1,439	1,019	544	674	606
Efficiency – Physical					
Litres of milk from home grown feed (L/day)	10.6	10.0	9.5	10.3	10.2
Production per cow (L)	6,844	5,894	5,664	5,678	5,422
Litres per labour unit					
- On farms <1.0 m L	352,651	321,378	331,424	356,710	368,835
- On farms >1.0 m L	504,816	504,583	513,677	523,511	514,334

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

⬆ *Profitability*

There was a dramatic rise in operational return on assets in 2007-08 to 10.3%. This rise was driven by two factors.

- An increase in milk receipts, up by 14 cents to 53.9 c/L in south Queensland and up by 9.6 cents to 45.4 c/L in north Queensland.
- A rise in the value of dairy stock with milkers doubling in value to $1,800. Improved cattle values account for at least fifty percent of the return on assets.

These increases in stock values and milk receipts outweighed the rise in input costs.

The price rises for milk took effect in the later part of 2007. By early 2008 it was evident that farmers were prepared to reinvest in new plant and equipment. The profitability of different levels of total milk production, production per cow and production system are analysed throughout this report.

➡ *Solvency*

Farm equity remains strong at 83% and unchanged over the last few years.

⬆ *Capital/Financial Efficiency*

Asset Turnover Ratio (ATO) improved markedly as milk receipts and livestock values improved. ATO measures the returns generated per dollar invested. This year the average farm returned 27 cents per dollar invested, while top 25% farms returned 32 cents per dollar invested.

⬆ *Liabilities*

Liabilities per cow rose to $2,598 while interest costs rose to $212 per cow. Table 19 in Section 6.2 shows the average investment per cow for QDAS farms ranges from $14,961 to $18,620. The asset value includes the value of land, plant, livestock and other associated dairy assets.

The top 25% farms had higher debt per cow, at $2,836, than the QDAS average of $2,598.

⬆ *Feed related costs*

Feed related costs rose by 5.5 cents to 30.2 c/L. Part of this increase was a result of good spring and early summer rains allowing farmers to make and store significant quantities of silage in many regions. After calculating profit, it has been shown that feed inventories rose by 3.4c/L. This can be deducted from feed related costs to show a true change in feed costs.

Table 3 shows the cash and adjusted feed related costs for the three regions.

Table 3. Cash and inventory adjusted feed related costs (2007-08)

Region	Cash (c/L)	Adjusted (c/L)
South-east Qld (ex DD & SB)	28.3	26.6 ($1,499/cow)
Darling Downs & South Burnett	36.4	28.4 ($1,848/cow)
North Qld	26.2	25.5 ($1,382/cow)

Feed related costs account for 59% of every milk dollar earned and are therefore a major factor in farm profitability. Table 4 shows the rise in farm inputs that occurred during 2007-08.

Table 4. Indicative prices per tonne of major farm inputs (2007-08)

	July 2007	June 2008
Grain/pellets		
Sorghum	$268	$257
Wheat	$290	$400
Soybean meal	$473	$675
14% CP dairy pellet	$380	$404
Fertiliser		
Urea	$643	$981
CK88	$585	$975
Diesel		
Bowser price	$1.27	$1.62

⬆ *Margin over feed costs*

Even though feed related costs rose, with the increased milk receipts, the margin over feed related costs rose by 7.1 cents to 21.1 c/L or $1,220 per cow on the average farm and to $1,647 per cow on the top 25% farms.

⬆ *Total variable costs*

Total variable costs rose to 33.7 c/L, up from 28.1 cents in the prior year. This equates to $1,950 per cow, but still leaves a healthy gross margin on milk of $1,019 per cow. Feed related costs accounted for 90% of the variable costs. A healthy gross margin is essential if a high dairy operating profit is to be achieved. More details of variable costs can be found in Table 5.

Table 5. Variable cost and margins in c/L and $ per cow (2007-08)

	Var Costs c/L	Var Costs $/cow	Gross Margin on milk/cow	Gross Margin whole farm/cow
South-east Qld (ex DD & SB)	31.8	1,787	1,237	1,495
Darling Downs & S Burnett	39.3	2,565	959	1,395
North QLD	30.2	1,637	818	1,041
All QDAS	33.7	1,950	1,019	1,315

⬆ *Production per cow*

Production per cow improved by 230 litres to 5,894 litres. Production per cow is a driver of profitability and farms in the top 25% group achieved 6,844 litres per cow.

⬆ *Labour*

The data is section 6.4 describes the present labour resources and the cost of these resources. The average labour costs in QDAS rose $7,318 to $50,216. When an owner's labour contribution is multiplied by $15 per hour, the result is approximately $85,000 on the average farm, which is far more than is drawn as a living expense.

⬆ *Milk produced from home grown feed*

There has been a slight increase in the amount of milk produced from home-grown feed on the prior year to 10 litres per cow per day (51% of the milk produced). This is below an achievable target of 12 litres from tropical and 17 litres from temperate pastures. This KPI is important since home grown feed is the cheapest feed input regardless of the production system used to produce milk.

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 farms operating at 3 different production levels. More information on labour requirements for different production levels is given in section 6.4.

Table 6. Regional analysis of physical farm resources (2007-08)

	South East Queensland (ex Darling Downs & South Burnett)			**Darling Downs & South Burnett**		
	Farm production			Farm production		
	<1 million litres	1 – 1.5 million litres	>1.5 million litres	<1 million litres	1 – 1.5 million litres	>1.5 million litres
Mean production (Litres)	688,773	1,210,318	2,104,153	585,415	1,250,383	2,071,089
Cows (milkers + dry)	137	216	336	117	170	276
Mated heifers	25	41	57	31	34	46
Other heifers	66	95	131	51	77	164
Total dairy herd	228	352	524	199	281	486
Milking cow area (ha)	70	70	124	173	153	207
Effective dairy area (ha)	159	168	212	273	380	385
Stocking rate on milking area (cows/ha)	1.96	3.08	2.71	0.68	1.11	1.33
Labour units	1.8	3.0	4.7	2.2	2.8	3.7
Labour units required @38 hr week	2.9	3.8	5.6	3.2	4.9	5.2

Table 7. North Queensland physical farm resources (2007-08)

	North Queensland		
	Farm production		
	<1 million litres	1 – 1.5 million litres	>1.5 million litres
Mean production (Litres)	639,736	1,298,853	3,187,718
Cows (milkers + dry)	153	251	541
Mated heifers	27	42	72
Other heifers	62	93	256
Total dairy herd	242	386	869
Milking cow area (ha)	94	102	176
Effective dairy area (ha)	152	178	360
Stocking rate on milking area (cows/ha)	1.63	2.46	3.07
Labour units	1.8	2.9	5.0
Labour units required @38 hr week	2.5	3.6	6.4

3. Regional trends

Participation in QDAS is voluntary with 89 farms taking part this year. This equates to approximately 15 percent of the Queensland industry. While this provides significant information, it is not a random sample of the industry. In fact, the average QDAS farm produces at least 475,000 litres (60-70%) more milk annually than the average Queensland dairy farm.

From our sample, 67 farms (74%) 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 this period. Data is presented for south east Queensland, north Queensland and the Darling Downs and South Burnett regions. Insufficient data was available to accurately reflect the position in central Queensland.

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 and extended to some minor extent into 2007-08. All regions experienced higher input costs, in particular concentrates, fuel and fertiliser as detailed in Table 4.

Offsetting these rises in input costs was a rise in milk receipts which took effect from November 2007. The very noticeable change in operating profit was driven to a large extent by the increase in cattle values.

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

Figure 2 Dairy operating profit per cow (2004-05 to 2007-08)

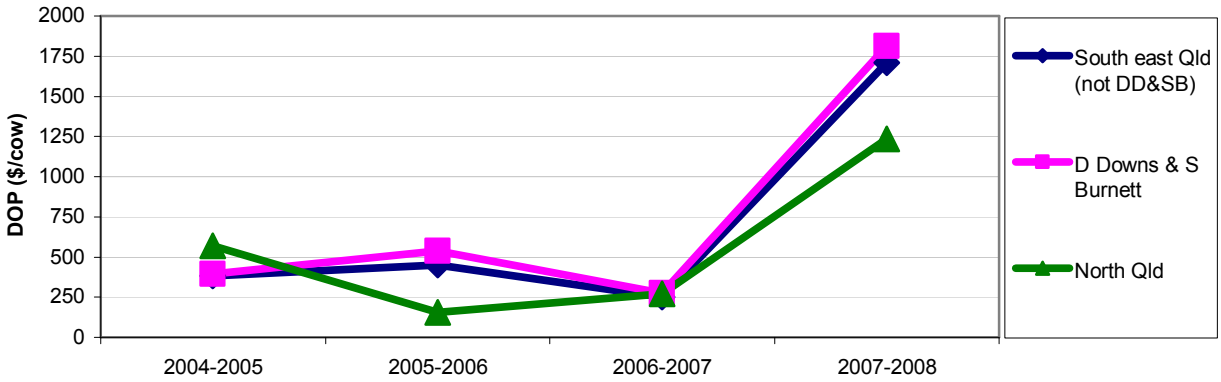
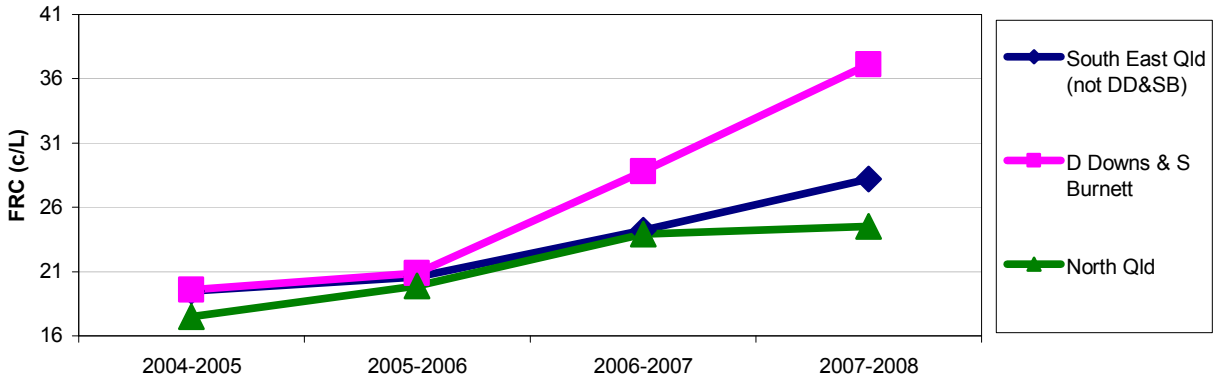


Figure 3 Feed related costs per litre (2004-05 to 2007-08)



3.1 South-east Queensland (excluding Darling Downs and South Burnett)

- This data is from farms with a minimum of 4 years continuous QDAS participation.
- Average farm production was 1,020,226 litres and has been relatively stable for the last four years, reflecting little change in individual animal production or size of the milking herd.
- From November 2007 milk prices increased and are reflected in the milk receipts figure of 54.2 c/L, an increase of 13.6 cents on the prior year. This was the first substantial increase since deregulation in 2000.
- Feed related costs have increased each year, and by 4.0 c/L on last year to 28.2 c/L. Total variable costs represent 58% of gross milk income. These are cash costs and are adjusted for the increase in feed inventories when calculating farm profit.
- Dairy operating profit per cow increased by $1,457, a massive increase on the prior years. This reflects the increase in stock values.
- The Beaudesert, Brisbane Valley and Moreton districts were in an EC declared area for the whole of 2007-2008.

Table 8. South-east Queensland (excluding Darling Downs and South Burnett) trends (2004-05 to 2007-08)

	2004-05	2005-06	2006-07	2007-08
Milk receipts (c/L)	35.9	37.6	40.6	54.2
Cows (milkers + dry)	204	209	207	200
Production per cow (L)	5,724	5,905	5,601	5,658
Feed related costs (c/L)	19.5	20.6	24.2	28.2
Total variable costs (c/L)	22.6	23.9	27.5	31.6
Gross margin (c/L)	13.3	13.7	13.1	22.6
Equity (%)	87	90	90	90
Return on assets (%)	3.4	3.4	1.6	9.2
Operating profit margin (%)	16.2	17.9	10.2	40.6
Dairy operating profit ($/cow)	384	451	252	1,709

3.2 Darling Downs and South Burnett

- This data is from farms with a minimum of 4 years continuous QDAS participation.
- This region is characterised by smaller herds. Average farm production was 918,000 litres and has been relatively stable for the last two years, reflecting little change in individual animal production or size of the milking herd.
- Many farms in the region are now using mixed rations and production per cow will continue to steadily increase.
- Dairy operating profit per cow rose markedly to $1,813.
- From November 2007 milk prices increased and are reflected in the milk receipts figure of 53.8 c/L, an increase of 14.1 cents on the prior year. This was the first substantial increase since deregulation in 2000.
- Irrigation has been severely curtailed with water entitlements now at 40 to 50%.
- Feed related costs in the Table 9 showed an 8.3 c/L increase, but feed inventory were substantially increased due to good silage production in the spring and early summer months.

Table 9. Darling Downs and South Burnett trends (2004-05 to 2007-08)

	2004-05	2005-06	2006-07	2007-08
Milk receipts (c/L)	34.6	36.9	39.7	53.8
Cows (milkers + dry)	145	148	148	150
Production per cow (L)	5,666	5,713	6,117	6,120
Feed related costs (c/L)	19.6	20.9	28.8	37.1
Total variable costs (c/L)	22.6	24.0	31.7	40.3
Gross margin (c/L)	12.0	12.9	8.0	13.6
Equity (%)	81	82	81	84
Return on assets (%)	3.1	3.7	1.7	9.7
Operating profit margin (%)	16.8	20.9	9.4	35.7
Dairy operating profit ($/cow)	395	539	276	1,813

3.3 North Queensland

- This data is from farms with a minimum of 4 years continuous QDAS participation.
- Average milk production was 1,718,313 litres in 2008, very similar to the preceding 3 years. Table 10 shows an increase in cow numbers over the four year period. There has been a slow recovery from the effects of the 2006 cyclone.
- Dairying in the tropical north Queensland has the advantage of high pasture production, but grain and protein meals have to be sourced from central and southern areas, and this incurs significant freight costs.
- From November 2007 milk prices increased and are reflected in the milk receipts figure of 45.2 c/L, an increase of 9.7 cents on the prior year. This was the first substantial increase since deregulation in 2000.
- Feed costs have increased each year. In 2008 they were 24.5 c/L and total variable costs increased to 28.5 c/L.
- Cull sales are effected by the lack of abattoir facilities in close proximity to the dairying area.
- In 2006-07 the special cyclone Larry payments were made. Repayment are due to commence on these grants in the 2008-09 year.
- Dairy operating profit per cow rose markedly to $1,237.

Table 10. North Queensland trends (2004-05 to 2007-08)

	2004-05	2005-06	2006-07	2007-08
Milk receipts (c/L)	31.3	34.6	35.5	45.2
Cows (milkers + dry)	235	273	296	303
Production per cow (L)	5,058	6,067	5,612	5,671
Feed related costs (c/L)	17.5	19.9	23.9	24.5
Total variable costs (c/L)	21.2	23.5	27.6	28.5
Gross margin (c/L)	10.1	11.1	7.9	16.7
Equity (%)	82	81	82	82
Return on assets (%)	4.4	1.3	1.9	8.1
Operating profit margin (%)	26.2	7.0	11.1	35.6
Dairy operating profit ($/cow)	569	157	272	1,237

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.

The top group contained farms from each region, but Darling Downs farms made up 43 percent of the group, many using at least a partial mixed ration production system.

The following analysis highlights some of the reasons for the difference between the groups.

- There was little difference in the number of cows, but a 1,273 litres difference in production per cow has flowed through to total milk production figures of 1.39 mL and 1.18 mL.
- Milk receipts were 3.3 c/L higher. Of this 2.6 c/L came from higher bonus payments.
- Feed related costs (FRC) were similar per litre. However, the top 25% farms built up feed inventories by 6.0c/L as compared to 2.4c/L on the other farms. These changes in inventory levels are deducted from FRC to calculate the adjusted FRC, which was much lower on the top 25% farms.
- With the higher income and lower costs for milk produced in the year, the top 25% farms had significantly higher dairy operating profit.
- Large cattle trading profits and increases in inventories resulted in a higher total dairy receipt on the top 25% farms (82.7 c/L v's 70.8 c/L). The top 25% farms had larger and higher producing cows, which significantly increased their value during the year.
- The average investment per milker was higher at $17,247 on the top 25% farms.
- When the above data is compiled the operating profit on the top 25% farms was $2,640 per cow, over double that of the other farms. However, when both groups are amalgamated the QDAS result for operating profit per cow was $1,605 per cow, a dramatic increase on 2006-07.

Table 11. KPI for top 25% and the remaining 75% of farms (2007-2008)

	Top 25%	Remaining 75%
Physical traits		
Cows (milkers + dry)	208	216
Production per cow (L)	6,844	5,571
Farm production (mL)	1.394	1.182
Milk from HGF(L)	10.6	9.6
Cash Analysis		
Milk receipts (c/L)	53.7	50.4
Feed related costs (c/L)	29.2	30.7
Margin over FRC ($/cow)	1,958	1,680
Profit Analysis		
Change in feed inventory (c/L)	6.0	2.4
Adjusted FRC (c/L)	23.2	28.3
Total dairy receipts (c/L)	82.7	70.8
Dairy operating profit ($/cow)	2,640	1,267
Average investment ($/cow)	17,247	15,169

4.1 Production per cow

In prior years QDAS data has shown that farmers could confidently increase production per cow economically to at least 6,500 litres per cow. This year the data in Tables 12 and 13 indicates that this production level is as high as 7,500 to 8,000 litres.

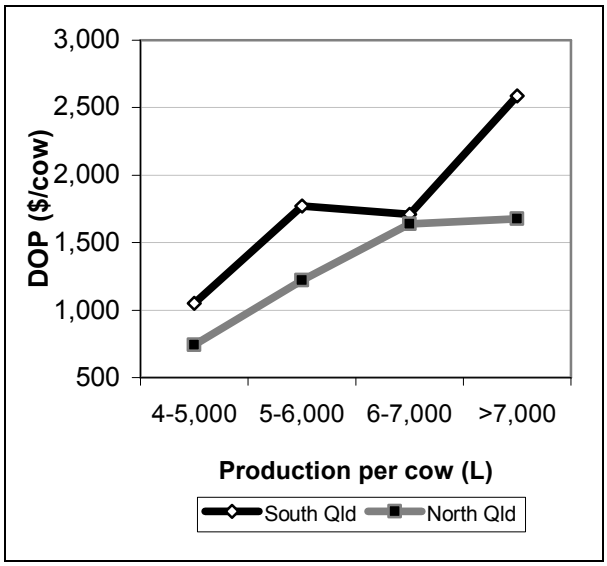
This change is driven by the higher milk price, well balanced rations, attention to detail and astute forward contracting of grain and protein meals. More than half of the high production farms in Table 12 are located on the Darling Downs. The favourable spring and early summer allowed large volumes of silage to be made and stored.

There are several interesting issues raised by this data in Tables 12 and 13.

- The data shows that it is not the farms with the small herds that have high production per cow. In fact it is the farms with large herds that are implementing management systems that have greatly increased production per cow to over 8,000 litres.
- More importantly, the margin over feed related costs per cow in Table 12 has increased from $802 to $1,583 as production per cow increased.

There will be a limit increasing production using high cost supplements. The curve shown in Figure 4 indicates that economic production per cow has not been reached in this year.

Figure 4. The relationship between production per cow and dairy operating profit per cow (2007–08)



The data for north Queensland is presented in Table 13. North Queensland milk receipts are significantly lower than in the south. In addition several large herds skew the data set. Points to note are:

- The high production group (>7,000 L) had the highest operating profit per cow, $1,678.
- North Queensland herds are larger than those in south Queensland.
- North Queensland farms do have a natural advantage that the tropical environment does produce large volumes of dry matter but cartage costs for some inputs are much higher.

In summary, because all farmers face a volatile farming environment with environmental regulations, changing climate, escalating input prices and high land values, the way forward must be to apply best management practices to all aspects of the operation. For some, a pasture based low input system will be appropriate but others may wish to intensify.

High input dairy systems demand high milk volumes be obtained through well formulated rations and a critical attention to detail in all aspects of feeding and especially reproductive management.

When changing to a high input system it is essential to still maximise home grown feed utilisation and minimise feed wastage. It is also essential to address the aspects of phasing and sizing an enterprise very seriously.

The M5 information series on the web at *www.dairyinfo.biz* covers these topics in some detail. Also tools are available to assist in formulating feed plans and budgets.

Table 12. KPI for 4 production per cow groups in south Queensland (2007-08)

	<5,000 L	5-6,000 L	6-7,000 L	>7,000 L
Farm milk production (L)	654,458	939,455	1,256,840	1,833,553
Cows (milkers + dry)	151	171	200	240
Production/cow (L)	4,414	5,607	6,400	7,763
Total milk income (c/L)	52.8	54.7	53.1	54.3
Margin over FRC (c/L)	18.5	26.1	20.3	20.7
Margin over FRC/cow ($)	802	1,437	1,276	1,583
Dairy operating profit ($/cow)	1,049	1,769	1,711	2,588

Table 13. KPI for 4 production per cow groups in north Queensland (2007-08)

	<5,000 L	5-6,000 L	6-7,000 L	>7,000 L
Farm milk production (L)	809,330	3,394,062	1,279,652	2,041,482
Cows (milkers + dry)	198	622	203	282
Production/cow (L)	4,239	5,537	6,484	7,436
Total milk income (c/L)	45.1	45.9	45.0	44.2
Margin over FRC (c/L)	19.2	18.8	21.5	16.9
Margin over FRC/cow ($)	787	1,027	1,357	1,225
Dairy operating profit ($/cow)	741	1,222	1,638	1,678

4.2 Herd size

Looking at Table 14 it is clear that size does matter, and that a larger operation can be profitable.

Farms with the largest herds and production (the greater than two million litres group) achieved:

- The highest per cow production at 6,437 L.
- The best labour efficiency, measured in litres of output per labour unit.
- High margin over feed related costs at $1,271/cow.
- The highest operational return on assets at 15.2%.
- High dairy operating profits, shown in Figure 5.

Many farms on the Darling Downs have adopted a more intensive system of production. While the margins per litre were very tight during the period 2004-07, the increased production has allowed them to remain farming. With the improved conditions this year a good result has been achieved.

Attention to detail is essential to produce a healthy gross margin as this is the key to producing a high dairy operating profit. The major farm costs continue to be feed, labour and debt servicing.

Larger farms produce more milk, over 600,000 litres, per labour unit. This is a key efficiency trait that must be addressed as herds increase in size. With labour costs at over $200,000 on large farms 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. Labour is examined in more detail in section 6.4.

Figure 5. Relationship between farm milk production and dairy operating profit per cow (2007-08)

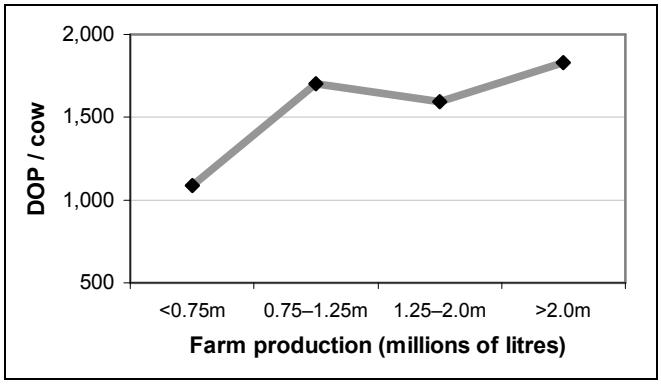


Table 14. KPI for farms in 4 production groups (2007-08)

	<750,000 L	750,000 – 1.25m L	1.25 – 2.0m L	>2.0m L
Farm milk production (L)	510,438	938,465	1,515,595	3,344,213
Cows (milkers + dry)	111	171	249	528
Production per cow (L)	4,680	5,603	6,211	6,437
Margin over FRC ($/cow)	942	1,288	1,260	1,271
Gross margin (milk)/cow ($)	754	1,095	1,052	1,063
Gross margin/farm ($)	123,382	239,260	338,691	688,107
Litres per labour unit	283,577	391,027	445,763	655,728
Return on assets (%)	5.4	10.1	10.3	15.2
Operating profit margin (%)	31.2	39.8	36.0	40.1
Dairy operating profit ($)	120,839	291,005	397,257	966,191
Dairy operating profit ($/cow)	1,088	1,704	1,595	1,829
% Milk from home grown feed	58	50	46	53

*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 the 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. Achievable targets for milk production from home grown feed are 11.5 to 13.5 litres per cow per day from tropical forages and 15-17 litres for temperate forages.

Table 15 examines milk production from home–grown feed, which is grazing plus conserved home grown hay and silage. In each region the farms are broken into two groups: those with below average feed related costs and those with above average feed related costs.

Points to note:

- All farms could improve production from home–grown feeds, but under difficult conditions a creditable result was achieved on many farms.
- In the south of the state the farms that had below average feed related costs produced more milk from home feed than the group with high feed related costs. They also obtained a higher dairy operating profit per cow. In north Queensland there was less variation in feed costs among farms and this is reflected in the figures in Table 15.

Table 15. An analysis of farms above and below the regional FRC averages (2007-08)

Region	Average FRC[1] c/L	Below the regional FRC average		Above the regional FRC average	
		Litres per cow from Home grown feed	DOP ($/cow)	Litres per cow from Home grown feed	DOP ($/cow)
South-east Queensland (ex Darling Downs & South Burnett)	28.3	11.5	1,962	8.7	1,550
Darling Downs & South Burnett	36.4	13.1	2,311	5.8	1,610
North Queensland	26.2	11.0	1,180	10.1	1,239

[1] FRC is a cash cost, unadjusted for inventories

5. Farming system analysis

In 2007-08 farms located in south Queensland, ie south east coastal, Darling Downs and the South Burnett were categorised by the production system they used.

- Total mixed ration (TMR)
- Partial mixed ration (PMR)
- Grazing system

Table 16 shows the KPI obtained from this analysis. The analysis identifies several issues.

Two of the important drivers of income are the number of lactations and production per cow. These were higher on farms using a TMR system of production. The TMR farms produced 2,064 litres per cow more than the grazing system farms and they had 53 more lactations.

Grazing based systems had lower feed costs. These were 4.5 c/L lower than in the TMR system. The KPI of the PMR system farms tended to lie between the KPI of the other two systems.

The higher milk production on TMR farms resulted in a higher operating profit and return on assets this year.

The location of the farms did affect the asset value. 73 percent of the PMR farms were coastal farms with very high land values. 79 percent of TMR farms were located on the Darling Downs with lower land values. Grazing farms were divided between both areas.

It is not prudent or possible in some situations for farmers to change their production system. The skills, infrastructure and resources required to change must be considered as well as the farmers position in the business lifecycle.

The gross margins for these systems are attached as Appendix 7.8, 7.9 and 7.10.

Table 16. KPI for three farming systems (2007-08)

	TMR system	PMR system	Grazing system
Milk receipts (c/L)	53.7	53.8	54.3
Production per cow (L)	7,329	6,054	5,265
Farm production (L)	1,485,906	1,200,974	787,813
Cows (milkers + dry)	205	203	152
Feed related costs (cash c/L)	37.1	31.5	26.2
Feed related costs (corrected c/L)[(1)]	28.6	27.5	24.1
Dairy operating profit ($/cow)	2,300	1,767	1,587
Return on assets – operational (%)	17.2	10.4	9.1

[(1)] FRC corrected include the FRC (cash) less the change in value of feed inventories during the year

6. Other Results

6.1 Calculating total production costs

All 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 and adjusted entries 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.

Section 4 describes the characteristics of farms in the top 25% group in detail. Tables 17 and 18 show the receipts and cost as determined in a profit analysis and also on a cash basis for 2007-2008 for the top 25% farms and the remaining 75% of QLD farms.

Milk production of the top 25% farms was 1.39 million litres and 1.18 million litres on the remaining farms.

The variation in dairy receipts in the profit analysis comes from cattle trading profit and inventory adjustments. A profit map for the top 25% of farms in 2008 is included as Appendix 7.1 and shows how QDAS calculates profit. This format complies 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 cows or labour units; a value per cow or per labour unit can be obtained.

Table 17. Production costs on QDAS farms – profit analysis (2007–08)

Profit analysis	Top 25% farms	Remaining 75% of farms
Total dairy receipts (c/L) [1]	**82.7**	**70.8**
Total variable cost (c/L)	32.3	34.4
Administration costs (c/L)	2.2	3.1
Paid labour costs (c/L)	3.6	4.2
Imputed labour (c/L) [2]	3.6	3.8
Depreciation costs (c/L)	1.7	2.2
Finance costs (c/L)	3.1	3.9
Total production costs (c/L)	**46.5**	**51.6**

[1] Total dairy receipts in a profit analysis include milk income, cattle trading profit, HGF & purchased feed changes, rebates and drought payments.
[2] The imputed labour cost is calculated using the formula shown in Table 22.

Table 18. Production costs for QDAS farms – cash analysis (2007–08)

Cash analysis	Top 25% farms	Remaining 75% of farms
Total farm receipts (c/L) [3]	**59.0**	**55.4**
Total variable cost (c/L)	32.3	34.4
Administration costs (c/L)	2.2	3.1
Paid labour costs (c/L)	3.6	4.2
Principal + interest payments (c/L)	5.1	6.8
Living expenses (c/L) [4]	3.9	4.6
Total production costs (c/L) [5]	**47.1**	**53.1**

[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.

6.2 Capital/financial efficiency

Three capital efficiency KPI are presented in QDAS. They are asset turnover ratio (ATO), total liabilities per cow and interest per cow.

ATO measures the income generated by the farm per dollar invested. The formula used in the analysis is:

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

The average ATO value for cooperating farms in 2007-08 was 0.27, while the top farms averaged 0.32. This indicates that for each dollar invested 27 and 32 cents were generated respectively. In 2006-07 farms averaged 0.18.These calculations are based on the average farm value for the year.

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 the operational return on assets calculation.

Table 19 shows the asset values for the dairy regions at the end of the financial year. Where farms have a number of sub-divided portions of land, or are located in semi-urban areas, values increase dramatically. For example in south east Queensland $21,996 is the value on the land, buildings, stock, plant and other dairy assets used per effective dairy hectare.

There are several critical questions to address when reviewing capital efficiency, or seeking to expand.

- Would relocation be an option for farms located in areas where land valuations are high? Farmers have been reluctant to relocate in the past. Where should future dairying be conducted?
- What would be the impact of leasing additional land rather than ownership, or contracting land preparation rather than owning plant? It is not traditional in Queensland to lease large areas of productive land. Contract rearing of stock is not popular at present but a few positive experiences are being recorded.
- What production system will be required in the future to remain profitable?

Farm equity is strong, it is driven by land values, if debt is not increased markedly.

The average debt and interest payments per cow have increased, but still remain within acceptable benchmarks.

Table 19. Land, plant and stock valuations for QDAS dairy farms as at 30 June 2008

	South east Qld		North Qld		D Downs &S Burnett	
Land & buildings ($)	2,875,919	76.5%	3,441,250	73.5%	1,918,683	66.2%
Stock ($)	453,543	12.1%	652,361	13.9%	400,551	13.8%
Plant ($)	205,178	5.5%	314,404	6.7%	304,336	10.5%
Other ($) [(1)]	226,697	6.0%	274,797	5.9%	273,417	9.4%
TOTAL ($)	3,761,337	100%	4,682,812	100%	2,896,987	100%
Investment per cow ($)	18,620		14,961		17.041	
Debt per cow ($)	1,863		2,638		3,720	
Investment per ha of effective dairy area ($)[(2)]	21,996		20,272		9,025	

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

(2) This is the value of the asset divided by the effective dairy area.

6.3 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 89 farms in QDAS was $35,401, 2.8 c/L, or $164 per cow. 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 20).

Table 20. Administration costs for farms with increasing annual production (2007-08)

Annual production	<750,000 L	750,000 –1.25 m L	1.25-2.0 m L	>2.0 m L
Farm production (L)	510,438	938,465	1,515,595	3,344,213
Administration ($)	27,567	28,060	36,059	73,924
Administration ($/cow)	205	164	145	140
Administration (c/L)	5.4	3.0	2.4	2.2

6.4 Labour resources

The average milk production per labour unit across all QDAS farms was 442,551 litres. Details on paid labour plus the opportunity cost of the owners/managers labour is summarised in Table 22 for 4 production groups.

There was a wide range in labour productivity:

- 37 % of farms produced less than 350,000 litres per labour unit
- 22 % between 350 and 450,000 litres
- 19 % between 451 and 550,000 litres
- 21 % 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 unpaid (imputed) labour is outlined in Table 21.

An estimate of the actual hours of unpaid labour used on each farm was recorded in 2007-2008. 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 5,398 hours, which represents approximately $80,974 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 3,304 hours per year. This represents 9.0 hours every day of the year. Typically this is could be reflected as 9.5 hours on Monday to Saturday, 7.8 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 1.25 million litres, would incur a cost of 7.7 or 10.5 c/L, $478 or $607 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 21. Imputed labour / management allowance calculation (2007-08)

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 22. Labour statistics (2007-08)

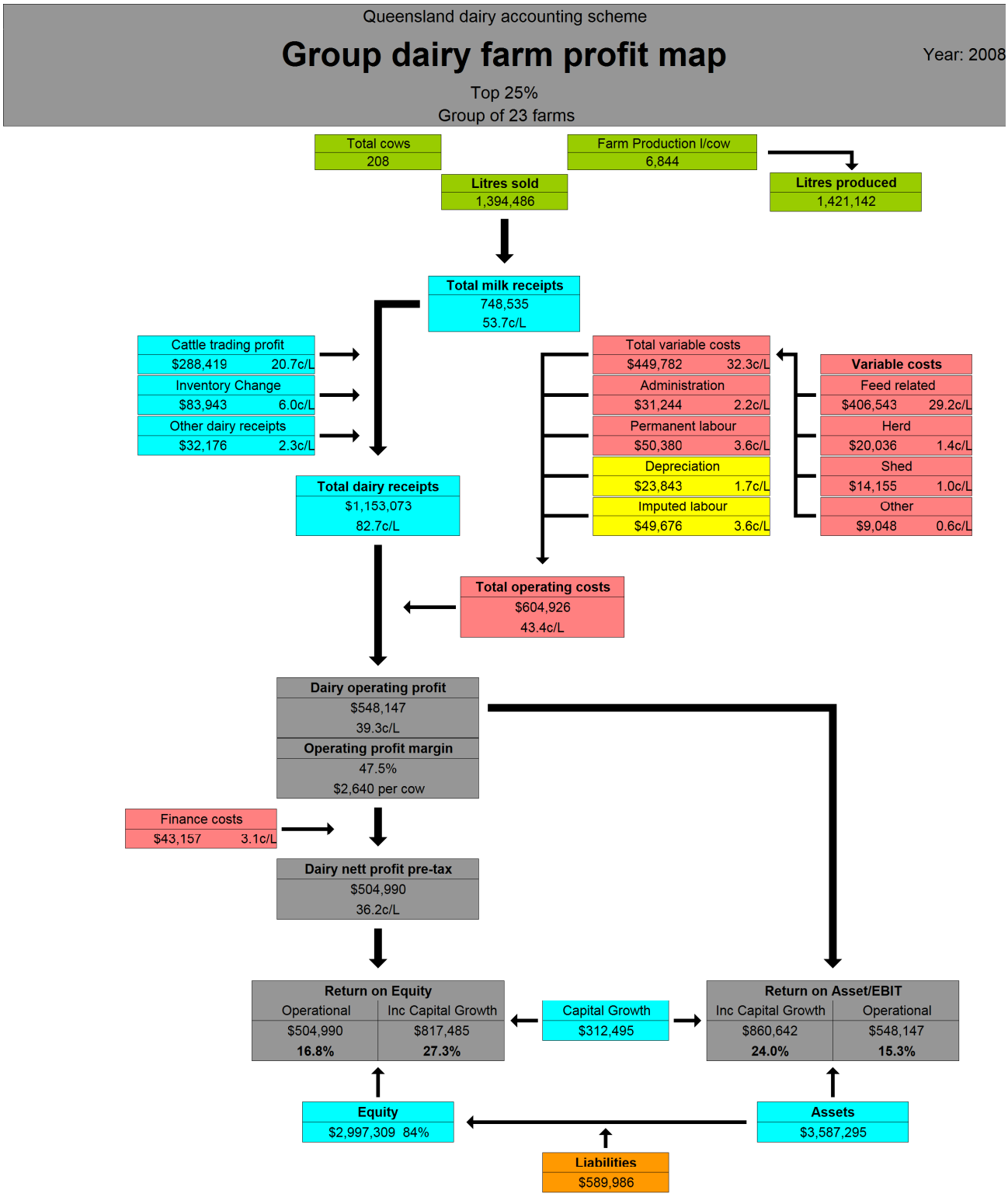
Farm production	No of units unpaid + paid labour	$ Cost * Imputed cost + paid labour	$ Cost ** owners labour paid on hourly basis + paid labour
<750,000 L	1.4 + 0.4	31,434 + 17,382 = 48,816	80,974 + 17,382 = 98,356
750,000 - 1.25 mL	1.7 + 0.7	51,926 + 25,116 = 77,042	87,886 + 25,116 = 113,002
1.25 mL – 2..0 mL	1.7 +1.7	54,000 + 67,660 = 121,660	83,882 + 67,660 = 151,542
>2.0 mL	1.8 + 3.3	54,000 + 158,775 = 212,775	89,175 + 158,775 = 247,950

* 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

7. Appendices

7.1 Map of farm performance – Top 25% of farms (2007–08)



7.2 Group cash gross margin – Top 25% of farms (2007–08)

Queensland dairy accounting scheme

Group cash gross margin

Period ending 6/2008

Top 25%

Receipts	Cents/litre	Dollars/cow		Total $ earned
Milk	45.2	3,032.27		629,657
Milk bonuses/incentives/rebates/other	8.5	572.48		118,878
Milk Receipts (1,394,486 l)	**53.7**	**3,604.75**		**748,535**
Stock sales - dairy	2.9	192.89		40,053
Stock sales - other	0.1	5.10		1,058
Produce sales	0.1	5.37		1,115
Other receipts	2.3	154.95		32,176
Non-milk receipts	**5.3**	**358.30**		**74,403**
Total farm receipts	**59.0**	**3,963.06**		**822,937**
Production costs	**Cents/litre**	**Dollars/cow**	**% Milk income**	**Total $ spent**
Purchased feeds	18.9	1,271.17	35.3	263,962
Fertiliser	2.4	157.96	4.4	32,801
Fuel & oil	1.6	107.72	3.0	22,368
Seed	0.7	45.05	1.2	9,354
Irrigation costs	0.4	28.81	0.8	5,982
Repairs & maintenance	1.6	108.76	3.0	22,583
Other feed costs	3.5	238.34	3.5	49,492
Feed related costs	**29.2**	**1,957.81**	**54.3**	**406,543**
Margin over feed related costs	**24.5**	**1,646.94**	**45.7**	**341,991**
Animal health	1.1	70.55	2.0	14,649
Herd improvement	0.4	25.94	0.7	5,387
Herd costs	**1.4**	**96.49**	**2.7**	**20,036**
Dairy shed costs - electricity	0.5	36.66	1.0	7,612
Dairy shed costs - chemicals	0.5	31.51	0.9	6,543
Shed costs	**1.0**	**68.17**	**1.9**	**14,155**
Cartage	0.1	5.60	0.2	1,162
Levies	0.3	20.87	0.6	4,333
Sundry variable costs	0.3	17.11	0.5	3,552
Other variable costs	**0.6**	**43.57**	**1.2**	**9,048**
Total variable costs	**32.3**	**2,166.03**	**60.1**	**449,782**
Gross margins - milk only	**21.4**	**1,438.72**	**39.9**	**298,753**
- whole farm	**26.8**	**1,797.02**	**49.9**	**373,155**
Permament wages	3.6	242.62	6.7	50,380
Personal drawings etc	0.4	24.78	0.7	5,146

Labour inputs		Areas (ha)		Stock		Production		
Permanent unpaid	1.7	Milking cow	114	Milking and Dry Cows	208	Fed to calves (L)	26,657	2%
Permanent paid	1.3	Effective dairy	242	Mated heifers	43	Protein total (kg)	45,074	3.23%
Casual paid	0.0	Irrigation	30	Other heifers	100	Butterfat total (kg)	54,851	3.93%
Imputed (38 hr/wk)	3.7			Adult equivalents	271	Milk solids (kg)	99,925	
						Litres / cow	6,844	
						Milk solids / cow (kg)	481	

Farms in report 23

Total Operating Costs	$604,926
Dairy Operating Surplus (EBIT)	$548,147
ROA (Operational)	15.3%
Asset value	$3,587,295
Equity	84%

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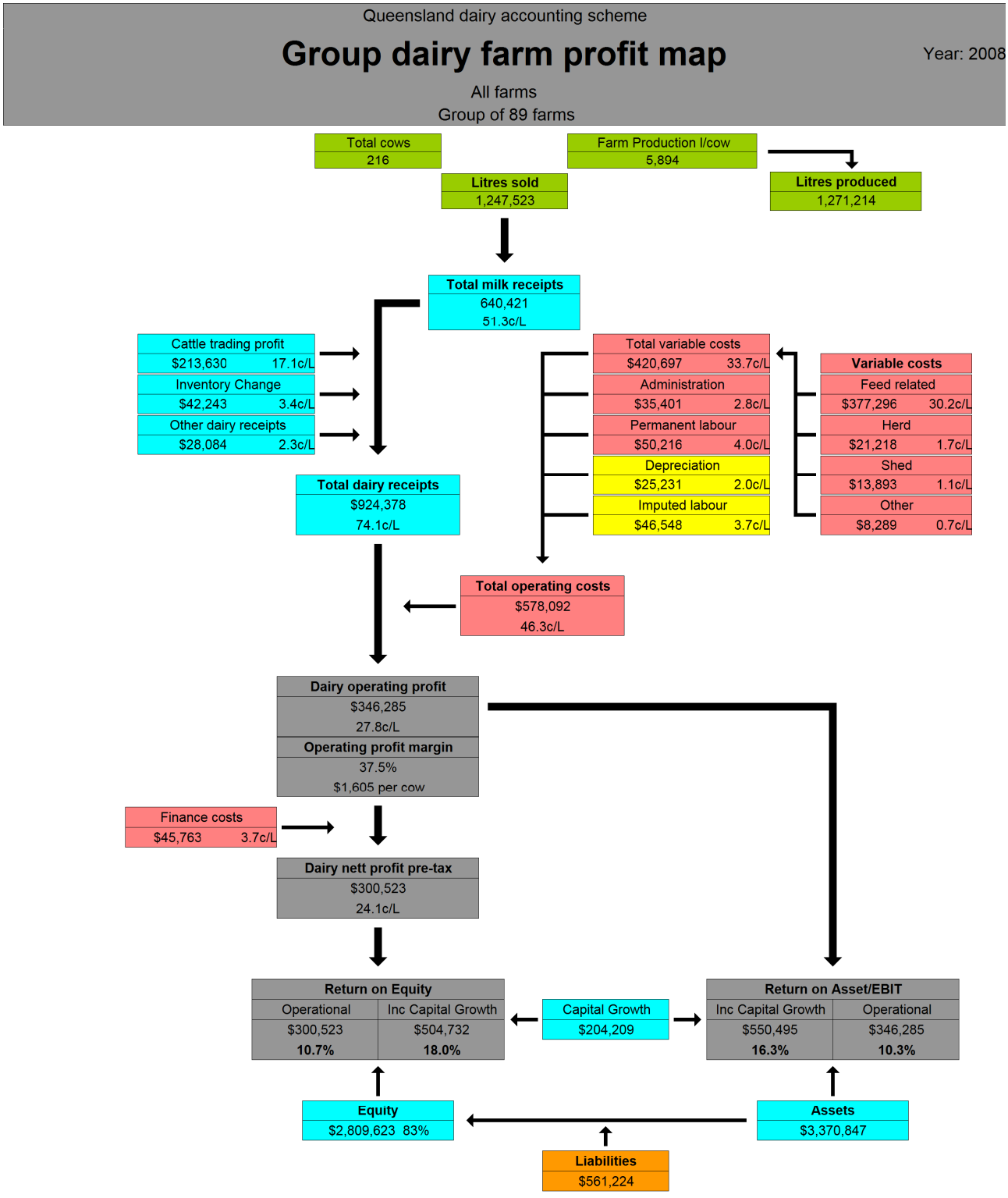
7.3 Map of farm performance – All 89 QDAS farms (2007–08)



7.4 Group cash gross margin – All 89 QDAS farms (2007–08)

Queensland dairy accounting scheme

Group cash gross margin

Period ending 6/2008

All Farms

Receipts	Cents/litre	Dollars/cow		Total $ earned
Milk	44.6	2,578.45		556,163
Milk bonuses/incentives/rebates/other	6.8	390.63		84,258
Milk Receipts (1,247,523 l)	**51.3**	**2,969.08**		**640,421**
Stock sales - dairy	2.7	154.85		33,401
Stock sales - other	0.1	3.91		843
Produce sales	0.1	7.11		1,533
Other receipts	2.3	130.20		28,084
Non-milk receipts	**5.1**	**296.07**		**63,861**
Total farm receipts	**56.5**	**3,265.15**		**704,282**
Production costs	**Cents/litre**	**Dollars/cow**	**% Milk income**	**Total $ spent**
Purchased feeds	19.0	1,101.24	37.1	237,533
Fertiliser	2.9	166.92	5.6	36,005
Fuel & oil	1.7	100.86	3.4	21,754
Seed	0.9	49.49	1.7	10,675
Irrigation costs	0.5	30.85	1.0	6,655
Repairs & maintenance	1.8	103.23	3.5	22,265
Other feed costs	3.4	196.61	3.4	42,409
Feed related costs	**30.2**	**1,749.20**	**58.9**	**377,296**
Margin over feed related costs	**21.1**	**1,219.88**	**41.1**	**263,125**
Animal health	1.1	66.39	2.2	14,321
Herd improvement	0.6	31.98	1.1	6,897
Herd costs	**1.7**	**98.37**	**3.3**	**21,218**
Dairy shed costs - electricity	0.6	32.96	1.1	7,110
Dairy shed costs - chemicals	0.5	31.45	1.1	6,783
Shed costs	**1.1**	**64.41**	**2.2**	**13,893**
Cartage	0.1	5.99	0.2	1,292
Levies	0.3	18.08	0.6	3,899
Sundry variable costs	0.2	14.36	0.5	3,098
Other variable costs	**0.7**	**38.43**	**1.3**	**8,289**
Total variable costs	**33.7**	**1,950.41**	**65.7**	**420,697**
Gross margins - milk only	**17.6**	**1,018.67**	**34.3**	**219,724**
- whole farm	**22.7**	**1,314.74**	**44.3**	**283,585**
Permament wages	4.0	232.81	7.8	50,216
Personal drawings etc	1.1	65.16	2.2	14,056

Labour inputs		Areas (ha)		Stock		Production		
Permanent unpaid	1.6	Milking cow	126	Milking and Dry Cows	216	Fed to calves (L)	23,691	2%
Permanent paid	1.2	Effective dairy	241	Mated heifers	38	Protein total (kg)	40,337	3.23%
Casual paid	0.0	Irrigation	34	Other heifers	99	Butterfat total (kg)	49,418	3.96%
Imputed (38 hr/wk)	4.0			Adult equivalents	276	Milk solids (kg)	89,755	
						Litres / cow	5,894	
						Milk solids / cow (kg)	416	

Farms in report 89

Total Operating Costs	$578,092
Dairy Operating Surplus (EBIT)	$346,285
ROA (Operational)	10.3%
Asset value	$3,370,849
Equity	83%

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7.5 Group cash gross margin – South-east Queensland excluding the Darling Downs and South Burnett (2007–08)

Queensland dairy accounting scheme

Group cash gross margin

Period ending 6/2008

South East Qld (excluding Darling Downs and South Burnett)

Receipts	Cents/litre	Dollars/cow		Total $ earned
Milk	46.4	2,609.76		528,169
Milk bonuses/incentives/rebates/other	7.4	414.65		83,918
Milk Receipts (1,137,960 l)	**53.8**	**3,024.41**		**612,087**
Stock sales - dairy	2.3	130.43		26,397
Stock sales - other	0.1	3.23		654
Produce sales	0.2	9.61		1,945
Other receipts	2.0	114.74		23,221
Non-milk receipts	**4.6**	**258.01**		**52,217**
Total farm receipts	**58.4**	**3,282.42**		**664,304**
Production costs	**Cents/litre**	**Dollars/cow**	**% Milk income**	**Total $ spent**
Purchased feeds	18.4	1,034.81	34.2	209,427
Fertiliser	2.7	151.58	5.0	30,677
Fuel & oil	1.5	83.88	2.8	16,975
Seed	0.9	50.89	1.7	10,298
Irrigation costs	0.7	39.90	1.3	8,075
Repairs & maintenance	1.9	107.40	3.6	21,735
Other feed costs	2.2	125.43	2.2	25,385
Feed related costs	**28.3**	**1,593.87**	**52.7**	**322,572**
Margin over feed related costs	**25.4**	**1,430.53**	**47.3**	**289,515**
Animal health	1.2	67.80	2.2	13,721
Herd improvement	0.5	27.95	0.9	5,656
Herd costs	**1.7**	**95.75**	**3.2**	**19,377**
Dairy shed costs - electricity	0.5	30.68	1.0	6,209
Dairy shed costs - chemicals	0.6	32.38	1.1	6,554
Shed costs	**1.1**	**63.07**	**2.1**	**12,763**
Cartage	0.1	3.74	0.1	757
Levies	0.3	18.17	0.6	3,678
Sundry variable costs	0.2	12.60	0.4	2,549
Other variable costs	**0.6**	**34.51**	**1.1**	**6,984**
Total variable costs	**31.8**	**1,787.20**	**59.1**	**361,697**
Gross margins - milk only	**22.0**	**1,237.21**	**40.9**	**250,390**
- whole farm	**26.6**	**1,495.23**	**49.4**	**302,607**
Permament wages	4.7	262.98	8.7	53,223
Personal drawings etc	0.2	9.41	0.3	1,904

Labour inputs		Areas (ha)		Stock		Production		
Permanent unpaid	1.4	Milking cow	79	Milking and Dry Cows	202	Fed to calves (L)	21,002	2%
Permanent paid	1.3	Effective dairy	171	Mated heifers	37	Protein total (kg)	37,069	3.26%
Casual paid	0.0	Irrigation	39	Other heifers	89	Butterfat total (kg)	46,063	4.05%
Imputed (38 hr/wk)	3.7			Adult equivalents	258	Milk solids (kg)	83,131	
						Litres / cow	5,727	
						Milk solids / cow (kg)	411	

Farms in report 34

Total Operating Costs	$510,189
Dairy Operating Surplus (EBIT)	$353,014
ROA (Operational)	10.2%
Asset value	$3,451,918
Equity	90%

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7.6 Group cash gross margin – Darling Downs and South Burnett (2007–08)

Queensland dairy accounting scheme

Group cash gross margin

Period ending 6/2008

Darling Downs and South Burnett

Receipts	Cents/litre	Dollars/cow		Total $ earned
Milk	44.8	2,918.29		495,654
Milk bonuses/incentives/rebates/other	9.3	605.40		102,823
Milk Receipts (1,107,162 l)	**54.1**	**3,523.69**		**598,476**
Stock sales - dairy	3.1	203.63		34,585
Stock sales - other	0.0	2.47		420
Produce sales	0.2	12.73		2,162
Other receipts	3.3	217.22		36,894
Non-milk receipts	**6.7**	**436.05**		**74,061**
Total farm receipts	**60.7**	**3,959.74**		**672,537**
Production costs	**Cents/litre**	**Dollars/cow**	**% Milk income**	**Total $ spent**
Purchased feeds	23.5	1,535.10	43.6	260,727
Fertiliser	1.7	109.33	3.1	18,569
Fuel & oil	2.4	154.49	4.4	26,239
Seed	1.0	63.29	1.8	10,750
Irrigation costs	0.3	21.85	0.6	3,711
Repairs & maintenance	1.9	122.18	3.5	20,752
Other feed costs	5.6	364.44	5.6	61,898
Feed related costs	**36.4**	**2,370.68**	**67.3**	**402,645**
Margin over feed related costs	**17.7**	**1,153.01**	**32.7**	**195,831**
Animal health	0.8	54.60	1.5	9,274
Herd improvement	0.5	31.40	0.9	5,333
Herd costs	**1.3**	**86.00**	**2.4**	**14,607**
Dairy shed costs - electricity	0.5	34.25	1.0	5,817
Dairy shed costs - chemicals	0.5	31.97	0.9	5,430
Shed costs	**1.0**	**66.22**	**1.9**	**11,247**
Cartage	0.1	7.61	0.2	1,292
Levies	0.3	20.74	0.6	3,523
Sundry variable costs	0.2	13.68	0.4	2,324
Other variable costs	**0.6**	**42.03**	**1.2**	**7,139**
Total variable costs	**39.3**	**2,564.93**	**72.8**	**435,638**
Gross margins - milk only	**14.7**	**958.75**	**27.2**	**162,838**
- whole farm	**21.4**	**1,394.80**	**39.6**	**236,899**
Permament wages	3.3	213.82	6.1	36,316
Personal drawings etc	0.9	57.26	1.6	9,725

Labour inputs		Areas (ha)		Stock		Production		
Permanent unpaid	1.8	Milking cow	180	Milking and Dry Cows	170	Fed to calves (L)	19,487	2%
Permanent paid	0.9	Effective dairy	321	Mated heifers	35	Protein total (kg)	36,251	3.27%
Casual paid	0.0	Irrigation	25	Other heifers	87	Butterfat total (kg)	44,290	4.00%
Imputed (38 hr/wk)	4.0			Adult equivalents	224	Milk solids (kg)	80,541	
						Litres / cow	6,633	
						Milk solids / cow (kg)	474	

Farms in report 32

Total Operating Costs	$578,645
Dairy Operating Surplus (EBIT)	$328,909
ROA (Operational)	12.4%
Asset value	$2,652,383
Equity	78%

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7.7 Group cash gross margin – North Queensland (2007–08)

Queensland dairy accounting scheme

Group cash gross margin

Period ending 6/2008

North Queensland

Receipts	Cents/litre	Dollars/cow		Total $ earned
Milk	42.0	2,274.07		712,692
Milk bonuses/incentives/rebates/other	3.3	180.72		56,638
Milk Receipts (1,696,309 l)	**45.4**	**2,454.79**		**769,330**
Stock sales - dairy	2.5	137.36		43,049
Stock sales - other	0.1	6.28		1,969
Produce sales	0.0	0.00		0
Other receipts	1.5	79.53		24,924
Non-milk receipts	**4.1**	**223.17**		**69,942**
Total farm receipts	**49.5**	**2,677.96**		**839,272**
Production costs	**Cents/litre**	**Dollars/cow**	**% Milk income**	**Total $ spent**
Purchased feeds	15.3	826.75	33.7	259,103
Fertiliser	4.5	243.41	9.9	76,285
Fuel & oil	1.2	67.08	2.7	21,022
Seed	0.7	36.59	1.5	11,467
Irrigation costs	0.5	25.06	1.0	7,854
Repairs & maintenance	1.6	84.13	3.4	26,366
Other feed costs	2.5	133.79	2.5	41,931
Feed related costs	**26.2**	**1,416.81**	**57.7**	**444,027**
Margin over feed related costs	**19.2**	**1,037.98**	**42.3**	**325,303**
Animal health	1.4	76.39	3.1	23,941
Herd improvement	0.7	37.74	1.5	11,828
Herd costs	**2.1**	**114.13**	**4.6**	**35,770**
Dairy shed costs - electricity	0.6	34.82	1.4	10,912
Dairy shed costs - chemicals	0.6	30.65	1.2	9,606
Shed costs	**1.2**	**65.47**	**2.7**	**20,517**
Cartage	0.1	7.64	0.3	2,396
Levies	0.3	15.91	0.6	4,986
Sundry variable costs	0.3	16.57	0.7	5,192
Other variable costs	**0.7**	**40.12**	**1.6**	**12,574**
Total variable costs	**30.2**	**1,636.53**	**66.7**	**512,887**
Gross margins - milk only	**15.1**	**818.26**	**33.3**	**256,443**
- whole farm	**19.2**	**1,041.43**	**42.4**	**326,384**
Permament wages	3.8	204.23	8.3	64,007
Personal drawings etc	2.6	139.60	5.7	43,750

Labour inputs		Areas (ha)		Stock		Production		
Permanent unpaid	1.7	Milking cow	125	Milking and Dry Cows	313	Fed to calves (L)	38,020	2%
Permanent paid	1.4	Effective dairy	231	Mated heifers	46	Protein total (kg)	53,558	3.16%
Casual paid	0.1	Irrigation	39	Other heifers	138	Butterfat total (kg)	64,552	3.81%
Imputed (38 hr/wk)	4.1			Adult equivalents	391	Milk solids (kg)	118,110	
						Litres / cow	5,534	
						Milk solids / cow (kg)	377	

Farms in report 20

Total Operating Costs	$706,572
Dairy Operating Surplus (EBIT)	$378,840
ROA (Operational)	8.5%
Asset value	$4,465,763
Equity	81%

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7.8 Group cash gross margin – Total mixed ration farms (2007–08)

Queensland dairy accounting scheme

Group cash gross margin

Period ending 6/2008

Total Mixed Ration Farms

Receipts	Cents/litre	Dollars/cow		Total $ earned
Milk	45.1	3,265.57		670,141
Milk bonuses/incentives/rebates/other	8.6	619.34		127,097
Milk Receipts (1,484,906 l)	**53.7**	**3,884.91**		**797,238**
Stock sales - dairy	2.6	186.96		38,367
Stock sales - other	0.0	3.51		720
Produce sales	0.1	4.44		911
Other receipts	3.3	241.02		49,461
Non-milk receipts	**6.0**	**435.94**		**89,460**
Total farm receipts	**59.7**	**4,320.84**		**886,698**
Production costs	**Cents/litre**	**Dollars/cow**	**% Milk income**	**Total $ spent**
Purchased feeds	25.5	1,844.67	47.5	378,553
Fertiliser	1.5	105.55	2.7	21,660
Fuel & oil	1.9	140.30	3.6	28,792
Seed	0.8	56.83	1.5	11,663
Irrigation costs	0.1	8.99	0.2	1,845
Repairs & maintenance	1.7	122.10	3.1	25,057
Other feed costs	5.6	403.29	5.6	82,761
Feed related costs	**37.1**	**2,681.73**	**69.0**	**550,330**
Margin over feed related costs	**16.6**	**1,203.17**	**31.0**	**246,908**
Animal health	0.7	53.30	1.4	10,938
Herd improvement	0.3	22.44	0.6	4,605
Herd costs	**1.0**	**75.74**	**1.9**	**15,543**
Dairy shed costs - electricity	0.5	33.77	0.9	6,930
Dairy shed costs - chemicals	0.4	29.78	0.8	6,112
Shed costs	**0.9**	**63.55**	**1.6**	**13,041**
Cartage	0.1	6.77	0.2	1,390
Levies	0.3	23.66	0.6	4,855
Sundry variable costs	0.2	17.88	0.5	3,669
Other variable costs	**0.7**	**48.31**	**1.2**	**9,913**
Total variable costs	**39.7**	**2,869.33**	**73.9**	**588,828**
Gross margins - milk only	**14.0**	**1,015.57**	**26.1**	**208,410**
- whole farm	**20.1**	**1,451.51**	**37.4**	**297,871**
Permament wages	2.3	164.58	4.2	33,775
Personal drawings etc	0.2	15.26	0.4	3,131

Labour inputs		Areas (ha)		Stock		Production		
Permanent unpaid	1.9	Milking cow	148	Milking and Dry Cows	205	Fed to calves (L)	19,143	1%
Permanent paid	1.1	Effective dairy	299	Mated heifers	31	Protein total (kg)	48,506	3.27%
Casual paid	0.0	Irrigation	8	Other heifers	88	Butterfat total (kg)	59,217	3.99%
Imputed (38 hr/wk)	4.2			Adult equivalents	256	Milk solids (kg)	107,723	
						Litres / cow	7,329	
						Milk solids / cow (kg)	525	

Farms in report 14

Total Operating Costs	$741,924
Dairy Operating Surplus (EBIT)	$471,917
ROA (Operational)	17.2%
Asset value	$2,742,294
Equity	77%

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7.9 Group cash gross margin – Partial mixed ration farms (2007–08)

Queensland dairy accounting scheme

Group cash gross margin

Period ending 6/2008

Partial Mixed Ration Farms

Receipts	Cents/litre	Dollars/cow		Total $ earned
Milk	44.5	2,636.14		534,148
Milk bonuses/incentives/rebates/other	9.3	550.28		111,500
Milk Receipts (1,200,974 l)	**53.8**	**3,186.42**		**645,648**
Stock sales - dairy	2.8	168.89		34,221
Stock sales - other	0.1	3.14		636
Produce sales	0.2	11.97		2,426
Other receipts	2.0	120.82		24,482
Non-milk receipts	**5.1**	**304.82**		**61,764**
Total farm receipts	**58.9**	**3,491.24**		**707,412**
Production costs	**Cents/litre**	**Dollars/cow**	**% Milk income**	**Total $ spent**
Purchased feeds	19.2	1,136.84	35.7	230,351
Fertiliser	2.4	140.69	4.4	28,507
Fuel & oil	2.2	131.42	4.1	26,630
Seed	1.0	58.38	1.8	11,829
Irrigation costs	0.6	37.96	1.2	7,691
Repairs & maintenance	2.2	130.98	4.1	26,540
Other feed costs	3.9	229.83	3.9	46,570
Feed related costs	**31.5**	**1,866.10**	**58.6**	**378,118**
Margin over feed related costs	**22.3**	**1,320.32**	**41.4**	**267,530**
Animal health	1.0	56.58	1.8	11,465
Herd improvement	0.5	27.23	0.9	5,518
Herd costs	**1.4**	**83.82**	**2.6**	**16,983**
Dairy shed costs - electricity	0.5	32.52	1.0	6,589
Dairy shed costs - chemicals	0.5	30.63	1.0	6,207
Shed costs	**1.1**	**63.15**	**2.0**	**12,796**
Cartage	0.1	4.86	0.2	985
Levies	0.3	18.92	0.6	3,835
Sundry variable costs	0.2	11.50	0.4	2,331
Other variable costs	**0.6**	**35.29**	**1.1**	**7,151**
Total variable costs	**34.6**	**2,048.36**	**64.3**	**415,048**
Gross margins - milk only	**19.2**	**1,138.06**	**35.7**	**230,600**
- whole farm	**24.3**	**1,442.88**	**45.3**	**292,364**
Permament wages	5.0	298.28	9.4	60,439
Personal drawings etc	0.5	30.05	0.9	6,090

Labour inputs		Areas (ha)		Stock		Production		
Permanent unpaid	1.5	Milking cow	142	Milking and Dry Cows	203	Fed to calves (L)	25,676	2%
Permanent paid	1.4	Effective dairy	268	Mated heifers	45	Protein total (kg)	39,102	3.26%
Casual paid	0.0	Irrigation	44	Other heifers	95	Butterfat total (kg)	48,156	4.01%
Imputed (38 hr/wk)	4.1			Adult equivalents	267	Milk solids (kg)	87,258	
						Litres / cow	6,054	
						Milk solids / cow (kg)	431	

Farms in report 24

Total Operating Costs	$582,659
Dairy Operating Surplus (EBIT)	$358,015
ROA (Operational)	10.4%
Asset value	$3,434,968
Equity	83%

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7.10 Group cash gross margin – Pasture based farms (2007–08)

Queensland dairy accounting scheme

Group cash gross margin

Grazing Farms

Period ending 6/2008

Receipts	Cents/litre	Dollars/cow		Total $ earned
Milk	47.7	2,468.35		375,862
Milk bonuses/incentives/rebates/other	6.6	341.37		51,982
Milk Receipts (787,813 l)	**54.3**	**2,809.72**		**427,843**
Stock sales - dairy	2.3	118.96		18,115
Stock sales - other	0.0	2.51		382
Produce sales	0.4	19.21		2,925
Other receipts	2.7	139.50		21,242
Non-milk receipts	**5.4**	**280.18**		**42,663**
Total farm receipts	**59.7**	**3,089.90**		**470,507**
Production costs	**Cents/litre**	**Dollars/cow**	**% Milk income**	**Total $ spent**
Purchased feeds	17.0	878.63	31.3	133,791
Fertiliser	2.7	139.86	5.0	21,297
Fuel & oil	1.4	70.82	2.5	10,783
Seed	1.0	51.69	1.8	7,870
Irrigation costs	0.8	42.68	1.5	6,498
Repairs & maintenance	1.5	80.10	2.9	12,197
Other feed costs	1.8	90.57	1.8	13,791
Feed related costs	**26.2**	**1,354.34**	**48.2**	**206,228**
Margin over feed related costs	**28.1**	**1,455.38**	**51.8**	**221,615**
Animal health	1.4	70.13	2.5	10,679
Herd improvement	0.7	34.43	1.2	5,243
Herd costs	**2.0**	**104.56**	**3.7**	**15,922**
Dairy shed costs - electricity	0.6	29.48	1.0	4,489
Dairy shed costs - chemicals	0.7	34.51	1.2	5,254
Shed costs	**1.2**	**63.99**	**2.3**	**9,744**
Cartage	0.1	5.08	0.2	774
Levies	0.3	17.57	0.6	2,675
Sundry variable costs	0.2	8.69	0.3	1,324
Other variable costs	**0.6**	**31.34**	**1.1**	**4,773**
Total variable costs	**30.0**	**1,554.23**	**55.3**	**236,667**
Gross margins - milk only	**24.3**	**1,255.49**	**44.7**	**191,176**
- whole farm	**29.7**	**1,535.67**	**54.7**	**233,840**
Permament wages	4.5	232.51	8.3	35,405
Personal drawings etc	0.5	25.29	0.9	3,851

Labour inputs		Areas (ha)		Stock		Production		
Permanent unpaid	1.4	Milking cow	99	Milking and Dry Cows	152	Fed to calves (L)	13,961	2%
Permanent paid	0.9	Effective dairy	163	Mated heifers	27	Protein total (kg)	25,771	3.27%
Casual paid	0.0	Irrigation	34	Other heifers	73	Butterfat total (kg)	32,203	4.09%
Imputed (38 hr/wk)	3.2			Adult equivalents	195	Milk solids (kg)	57,974	
						Litres / cow	5,265	
						Milk solids / cow (kg)	381	

Farms in report 22

Total Operating Costs	$352,855
Dairy Operating Surplus (EBIT)	$241,652
ROA (Operational)	9.1%
Asset value	$2,644,970
Equity	89%

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7.11 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 23. Key performance indicators used in QDAS

Profitability

- Return on asset (RoA) operational – %
- Return on equity (RoE) operational – %
- Operating profit margin (OPM) – %
- Dairy operating profit (DOP) –$/cow

Solvency

- Equity% – %
- Debt to equity ratio

Efficiency

- 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

(Dairy operating profit ÷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

((Dairy operating profit + increase in the value of land and improvements) ÷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

(Dairy net profit (pre tax) ÷ 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

((Dairy net profit (pre tax) + increase in the value of land and improvements) ÷ 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

(Dairy operating profit ÷ total dairy income) * 100.

Dairy operating profit per cow

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

Calculation

(Dairy operating profit ÷ 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

((Assets – Liabilities) / Assets) *100.

Debt to equity ratio

This is another way of expressing equity.

Calculation

Average Liabilities ÷ 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

Total dairy receipts ÷ Assets.

Total liabilities (debt) per milker

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

Calculation

Liabilities ÷ 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

Total interest payments ÷ 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

Total of all feed related costs ÷ 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

(Gross milk income – FRC) ÷ 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

TVC ÷ 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 is should not be confused with the profit KPI.

Calculation

(Milk income – TVC) ÷ 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

Total milk production ÷ 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

Total litres of milk ÷ 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.