

THE DAIRY INDUSTRY FARM MONITOR PROJECT: FEATURE ARTICLE

EFFECT OF THE MILK PRICE DROP ON FARM BUSINESSES

Claire Swann, DPI Ballarat
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Over the past 12 months the global financial crisis has created volatility in international markets unprecedented in recent times. Falling commodity prices has seen many dairy farm businesses nationwide face the first mid season step down in milk price since 1974. The substantial drop in demand for Australian export dairy products combined with climate variability, low water allocations and previous high farm gate prices has had a severe financial impact on farm businesses. The domestic market initially remained somewhat insulated from the milk price drop, up until the end of the financial year, as supply contracts for some farm businesses were still in place. At the time of writing the domestic market contracts were in the process of renegotiation at a lower milk price.

This article examines the effect of this milk price drop on participant farms from the 2008/09 Dairy Industry Farm Monitor Project. The aim of the article is to identify how the milk price and milk production have been influenced by the milk price drop, as well as examining the management strategies adopted by farm business to manage lower farm income.

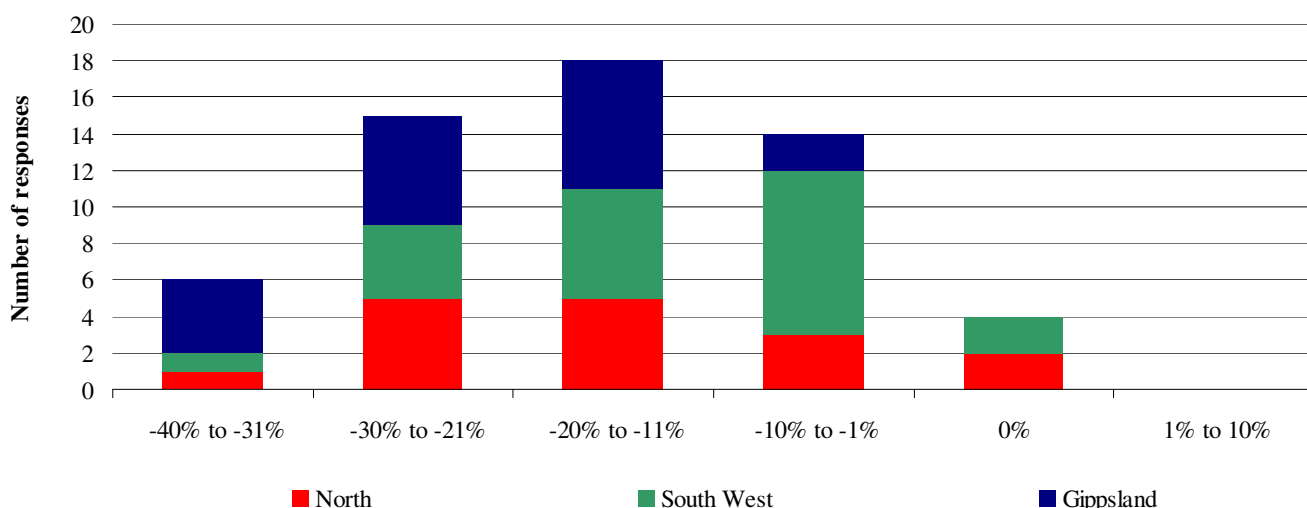
The following data was collected in June 2009 and refers to the 2008/09 financial year.

HOW WAS ON-FARM MILK PRICE AND MILK PRODUCTION AFFECTED?

The effect of the milk price drop on-farm is reflected by milk gross income. Milk gross income is milk income net of charges. That is milk income minus milk levy, pick up charges, GST and store trading account. It does not include inventory changes for livestock feed, or any other non milk income.

Forecast milk gross income in July 2008 was compared to actual milk gross income at June 2009. Participants' forecast is either estimations based on their own predictions or the factories prospective cash flow. Eleven out of 68 respondents to this question did not forecast their expected gross income for the period. These farm businesses have been excluded from this analysis.

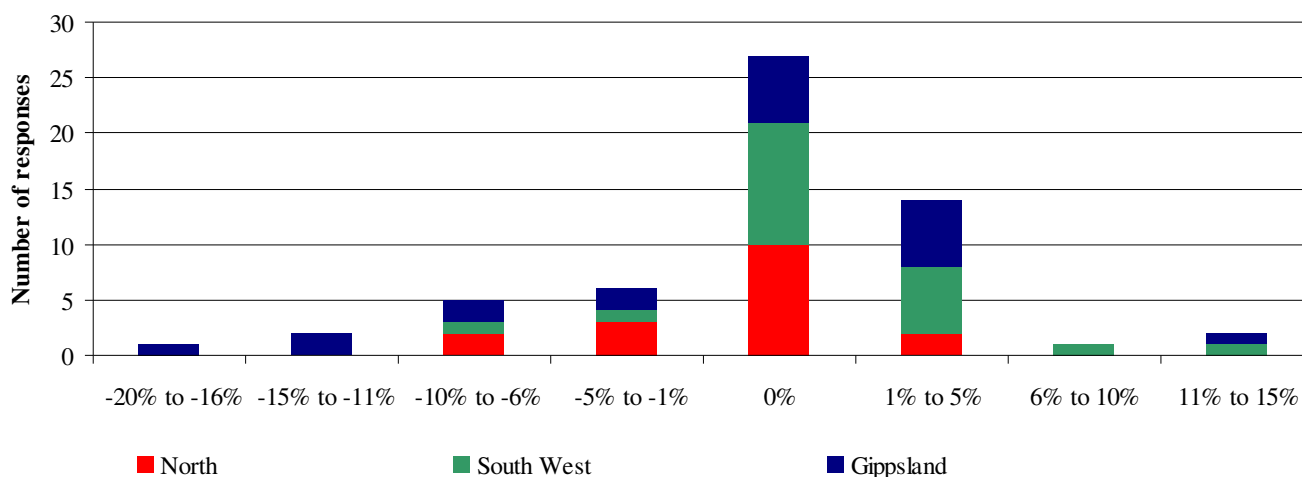
Figure 1. Distribution by the difference between forecast and actual milk gross income for farms in the North, the South West and Gippsland during 2008/09. Total of 57 farms included in this sample.



The majority of farm businesses (53 out of 57) across the state experienced a decrease in gross income as a result of the milk price drop (Figure 1). These 53 farm businesses had a reduction of at least 4% in milk gross income. The other farms were unaffected by the milk price drop, as they had supply contracts, and are recorded as 0% change in Figure 1.

The greatest distribution of farm businesses by difference between forecast and actual milk gross income occurred in the North. The average difference was -16% for this region. In the South West the majority of participants, nine out of 22 or 41%, had their forecast estimates between -1% to -10% different to their actual milk gross income. The average change for farms in the South West was -13%. All Gippsland participants had a decrease of milk gross income of at least 5%. The average difference between forecast and actual milk gross income for Gippsland participants' was -21%. The greatest difference was -37% for a farm in Gippsland; the greatest from all regions.

Figure 2. The distribution by the difference between forecast and actual milk production (litres or kg milk solids) for farms in the North, the South West and Gippsland during 2008/09. Total of 58 farms included in this sample.



During 2008/09 the majority of farms achieved milk production levels equal to that of their forecast (Figure 2). Ten farms did not forecast their milk production and are excluded from this analysis. Milk production in either litres or kg milk solids was accurately forecast by 47% of participants. In general terms, some farms aimed to produce 7,500 litres/cow/year while some farms aim to gradually increase their milk production each year.

Reasons why those farms that produced less milk than their forecast could be due to drying cows off or culling cows earlier than planned to reduce feed costs, or simply because of the inaccurate nature of forecasting. For some farms the marginal cost of supplementary feeding, especially of concentrates, would outweigh the marginal revenue from the extra milk income. Although marginal thinking was not a reason for the decreased milk production, it was a strategy in managing the milk price drop.

HOW DID PARTICIPANT FARM BUSINESSES MANAGE THE PRICE DROP?

The management strategies adopted by farm businesses in managing the milk price drop are recorded in Figure 3. Farm businesses selected and commented on a maximum of five strategies from the 14 options provided. The majority of participants used up to three different strategies to manage the drop and did not engage in as many as four or five different strategies.

The most common initial strategy adopted, by farm businesses across all regions, was revised cash flow budgets. This is shown by the green diagonal lines in Figure 3. Decreased personal spending was the most consistent management option strategy, across regions and across all 5 strategies. This is shown by the yellow horizontal lines in Figure 3.

NORTH

Revised cash flow and decreased personal spending were the most commonly used strategy by participant farms in managing the price drop (Figure 3). These options allowed the farm businesses in the North to discuss strategies and develop business plans with their advisors. Participants also chose to source cheaper feed alternatives in an attempt to limit feed input costs. This included buying water to ensure they had feed through the 2009 autumn, reducing supplementary feed and sourcing cheaper feeds for the ration.

SOUTH WEST

Similar to the North, the most popular first strategy in the South West in dealing with the milk price drop was revised cash flow budgets (Figure 3). The budgets were used to guide the other strategies used. These suggested whether individual farm businesses were better to pre-purchase their feed or purchase cheaper pasture seed. The revised budgets also meant some farm businesses immediately ceased or delayed any planned capital improvements.

Decreased business and personal spending became predominant management strategies at 4 and 5. This could be due to farm businesses engaging strategies that would have the greatest impact on the business. Farm businesses noted that they were looking at their farming business from a strategic level to better manage the drop in income and looking at cost of grain compared to milk price received. One farmer noted that decreasing their personal spending is a response in tight times but has minimal impact on cash flow.

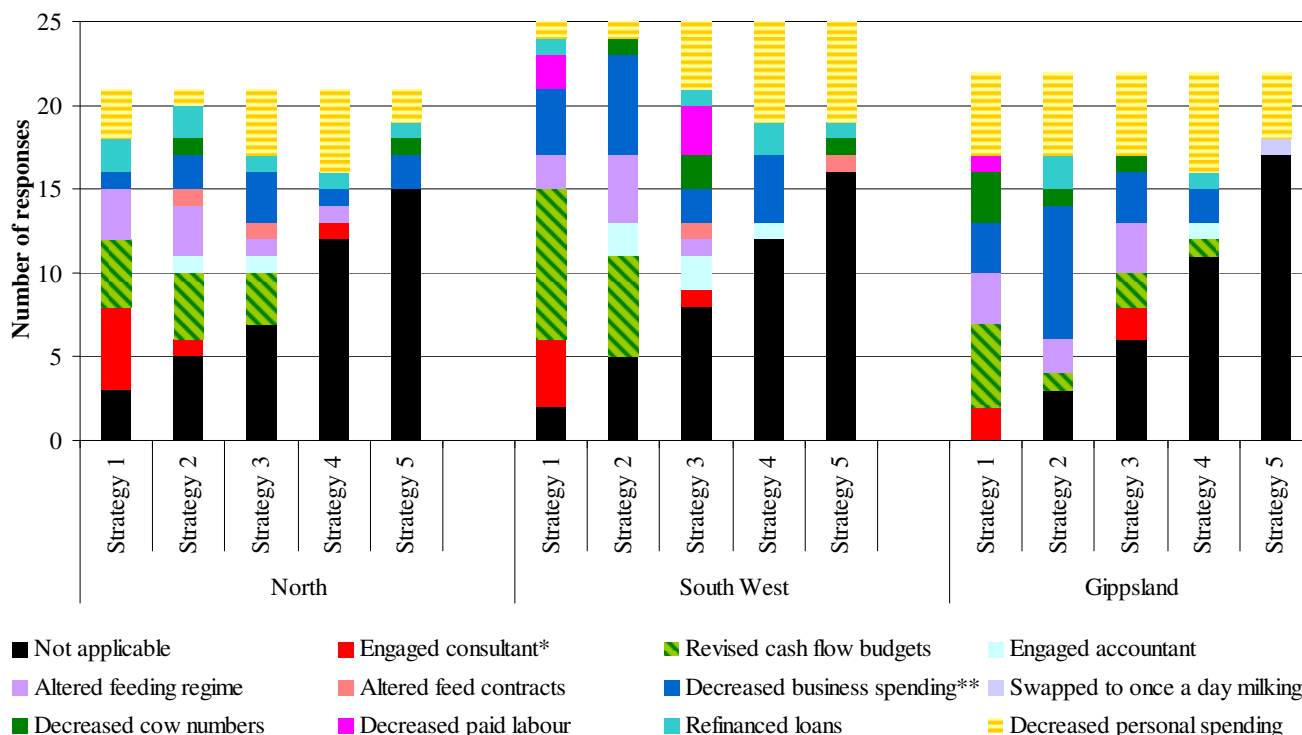
GIPPSLAND

All Gippsland participants used at least one strategy to deal with the milk price drop. An equal number of participants chose to revise their cash flow budgets and decrease personal spending as their first management strategy (Figure 3).

Decreased personal spending and decreased business spending were chosen through all strategies. These strategies were very similar and included participants delaying their capital expenditure, altering amounts of fertiliser and not taking or changing their spending on holidays. Other farm businesses utilised their farm management deposits (FMDs); either withdrawing from their cash reserve or increasing their cash reserve to put some surplus cash aside for the future.

Interestingly, those farms that decreased their cow numbers found they improved their herd by removing 'passengers'. They also found that their cell count decreased as cows with mastitis problems were culled.

Figure 3. Management strategies adopted by farm businesses in Gippsland, the North and the South West to deal with the milk price drop. Total of 68 farms are included in this sample. This represents all Dairy Industry Farm Monitor Project participants.



*Engaged consultant or other professional advice ie nutritionist. **Decreased business spending (other than feed).

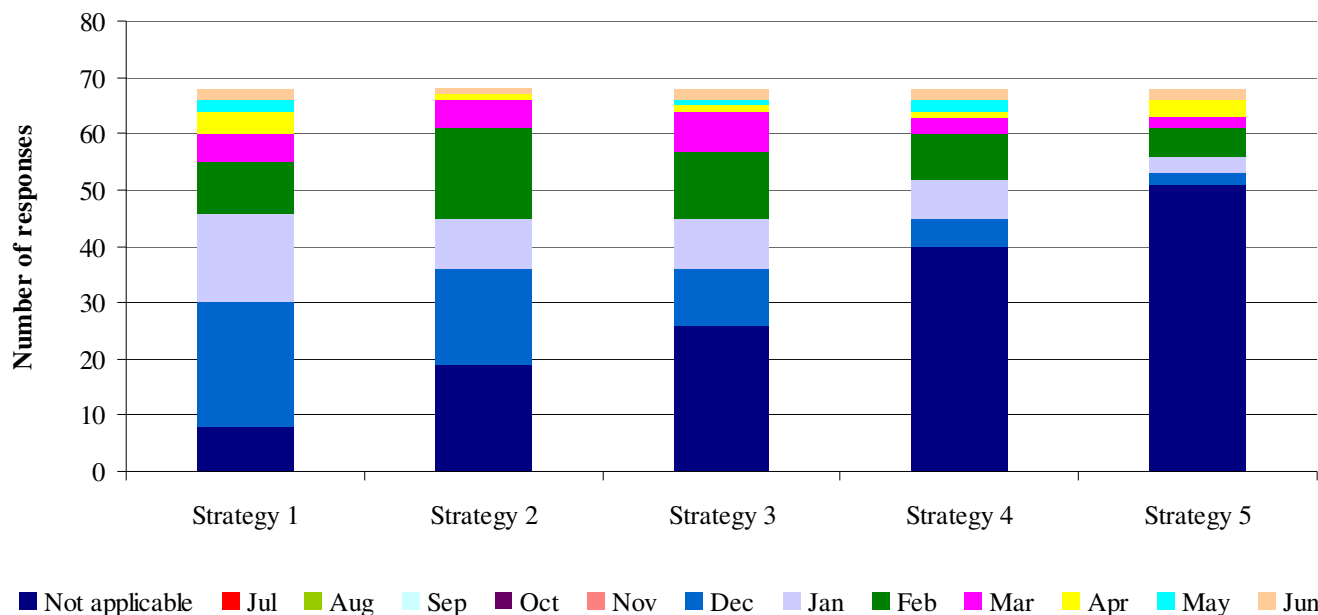
Note: Sold water and sold other assets were alternate management options. No participants engaged in these strategies.

Note: The not applicable management strategy is cumulative ie if a participant does not have strategy 2 they will not have a strategy 3 and so on.

The greatest uptake of strategies occurred during the summer months; December, January and February. The adoption of strategies during summer is a reflection of the reduction of the milk price at the same time. This suggests farm businesses immediately sought or actioned strategies to deal with the price drop.

December had the greatest uptake of all strategies (Figure 4). Most farm businesses engaged with strategy 1 and strategy 2 during this month; 21 out of 68 farm businesses engaged with their first strategy in dealing with the milk price drop in December and 17 engaged their second strategy in December.

Figure 4. The month when farm businesses from all regions (North, South West and Gippsland) engaged with the strategies to deal with the milk price drop during 2008/09. Total of 68 farms are included in this sample. This represents all Dairy Industry Farm Monitor Project participants.



CONCLUSION

The milk price drop had a significant influence over milk gross income for the majority of farms in the Dairy Industry Farm Monitor Project during 2008/09. Those farms whose milk income was not affected were supplying the domestic market or had supply contracts. Milk production was not influenced by the milk price drop as the majority of farms chose to maintain production similar to that forecast.

The strategies implemented show that those farm businesses affected by the milk price drop took action to adapt. These strategies varied depending on farm business structure, age of participants and farm business plans. The most popular chosen strategy 1 was revised cash flow budgets and the most common strategy overall was decreased personal and business spending.

Revised cash flow budgets allowed farm businesses to see their current financial business position and develop a plan moving forward. Decreased personal and business spending meant delayed capital expenditure and no or reduced spending on holidays for most farms.

FARM DEVELOPMENT OPTIONS – ECONOMICS AND RISK

Katherine Tarrant and Dan Armstrong, DPI Ellinbank

The first half of this article has dealt with the many tactical decisions farmers make to manage volatile economic and environmental conditions. The Modelling Dairy Farming Systems Project aims to tackle and provide robust insights into the strategic questions that often get put in the 'too hard' basket. Questions like:

Where do you want your farm business to be in 5 or 10 years? What's the best option to get there?

- Buy more land?
- More cows? Fewer cows?
- More inputs? Fewer inputs?

The emphasis of the project is on thorough questioning/thinking, and understanding the factors that make or break various systems, rather than precise predictions.

The project uses a real case study farm to provide initial data and context. A steering committee provides input into the design of potential development options for the farm moving forward into the future. This input is integrated with research results and robust economics to investigate the potential performance of each development option. The steering committee, comprised of six farmers and several other industry representatives, provides a constant 'reality check' of the assumptions underpinning the work. The approach is based on a project which has operated successfully in northern Victoria for several years.

This article will focus on the results of the first Gippsland case study farm.

THE CASE STUDY FARM

- Located in high rainfall hilly Gippsland (long term 1,000mm)
- 255 ha (140 ha Milking Area, 65 ha non-tractable land for young stock, 40 ha outblock)
- 350-380 milking cows
- Family owned and operated plus ~60 hours per week paid labour
- Operators allowance of \$85,000 for husband and wife team
- 50 unit rotary dairy with automated cup removers
- Stocking rate of between 2.5 and 2.7 cows/ha
- Concentrated single calving from mid July
- Grain consumption of about 1.7 - 1.9 t as fed/cow/year
- Pasture consumed 3.3 - 3.5 t DM/cow/year
- Pasture consumption of about 8.5 t DM/ha/year
- About 480 kg milk fat + protein/cow/year
- 55-60% of energy consumed is from the milking area
- Some hay and silage from the 40 ha outblock
- Assumed debt level of \$1,295,000, total farm value of \$3,400,000 (65% equity).
- Return to total capital (RoA) was about 2.4% in 2006/07, 11% in 2007/08 and is typically about 5%.

RESULTS

The financial performance indicates there is no great urgency to make dramatic changes to the business unless operating conditions change. However, there will be pressure to maintain profitability in the future if the owners don't continue developing the business (particularly if the kids come back to the farm to work). Also, climatic conditions in Gippsland in recent years have also stimulated a lot of discussion about stocking rate and risk versus return.

PRICE ASSUMPTIONS

The case study farm and development options were analysed with a range of milk and feed prices. The results reported in this article are based on 'typical/long-term' prices of \$4.70/kg milk fat + protein, \$290/t grain, \$220/t hay and \$650/t urea. Purchased land has been valued at \$7,000/acre.

THE DEVELOPMENT OPTIONS

One of the development options considered was the purchase of 100 acres (40 ha) of well developed land next to the current milking area.

Three versions of this option were developed:

- Herd size of 380 cows (reduce the stocking rate to about 2.1 cows/ha)
- Increase herd size to 490 cows (maintain a similar stocking rate)
- Increase herd size to 630 cows (increase stocking rate to 3.5 cows/ha)

Table 1 below shows the assumptions and results for the base farm and the three development options investigated.

Table 1. Assumptions and results for base farm and three development options.

	Base Farm No Change	Expand and reduce stocking rate	Expand and maintain stocking rate	Expand and increase stocking rate
Cow numbers	350	380	490	630
Milking Area (ha)	140	180	180	180
Grain (t as fed/cow/year)	1.7	1.5	2.1	2.3
Purchased hay (t DM/cow/year)	0.3	0.1	0.4	0.7
Proportion of feed purchased	43%	34%	47%	52%
Pasture (t DM/cow/year)	3.2	4.0	3.1	2.8
EBIT* in the steady state (Year 4)	\$113,000	\$184,000	\$150,000	\$135,000
Internal Rate of Return of the additional investment (IRR)^	-	9%	2%	-2%
Years in 100 where EBIT is less than \$0	19	9	22	29

* EBIT – Earnings Before Interest and Tax (operating profit)

^ The Internal Rate of Return (IRR) is the average return to assets each year over the development period. In this case, the IRR is the extra return to the extra capital invested in the business associated with the development. If the return to extra capital is greater than could be earned with other uses of the capital involved, then it is a good investment.

EXPANSION AND REDUCED STOCKING RATE:

The option of purchasing more land and maintaining 380 cows appeared economically attractive for the case study farm. The EBIT in the steady state increased by about \$70,000 once the change was implemented (Table 1). The increased profit was mostly derived from a reduction in the amount of purchased feed, from about 43% to 34% of the total energy consumed.

The 9% internal rate of return to the extra capital for this option suggests that purchasing the additional land would be a reasonable investment. This option also appeared to provide a more stable (or less variable?) financial performance than the base farm (a 9% versus 19% chance of negative EBIT was predicted).

There may be some challenges associated with maintaining per-cow production, pasture consumption and pasture quality with the reduced stocking rate. The analysis presented in Table 1 assumed that these factors could be maintained with the lower stocking rate (2.1 cows/ha) and lower grain feeding (1.5 t/cow). Four scenarios for this option were also tested with different combinations of reduced milk production per cow, reduced pasture quality and reduced pasture consumption. These results showed that the development option is very sensitive to each of these factors. It highlights then need for a planned approach if reducing stocking rate (seek support and advice where necessary)

This farm system, under any of the above assumptions requires a high level of management, and there have been concerns about how feasible it is. Comparative farm performance data from the region shows that there are a number of farms located in the area that achieve results consistent with the initial assumptions from this type of system.

EXPANSION AND MAINTAINED CURRENT STOCKING RATE:

Purchasing an additional 40 ha of land and milking 490 cows appeared less profitable than purchasing this land and milking 380 cows. This suggests that there is no urgency to increase cow numbers if additional land is purchased. As the farm owner said, 'This challenges the thinking that when we buy more land we have to immediately purchase more cows (maintain stocking rate) to service the debt'. Clearly this won't apply to all farms. The appropriate herd size would depend on a range of factors, including the stocking rate and pasture consumption prior to expansion and the quality of the land purchased.

An internal rate of return to extra capital of 2% for the 490 cow option suggests that there would need to be substantial real capital gain in land value for expansion to be an attractive investment (at the land price assumed). With respect to risk, expanding and milking 490 cows appeared to result in similar variability in profit to the base farm.

EXPANSION AND INCREASED STOCKING RATE:

Purchasing an additional 40 ha of land and milking 630 cows did increase the EBIT from the base farm level. However, the increase was not sufficient to justify the substantial capital expenditure (\$700,000 land, \$240,000 cows, \$170,000 feedpad and \$45,000 vat upgrade).

The 630 cow option resulted in a negative IRR to additional capital, which makes it a very unattractive investment. Variability in profit also increased with predictions of a 30% chance of a negative EBIT.

Some factors that could potentially improve the economic performance of this system include:

- Milk price incentives for larger scale production
- Increased pasture quality
- Improved labour efficiencies
- Construction of a cheaper feedpad.

This option appears more attractive if all of these factors are achievable. However, it still remains a risky system (a 20% chance of a negative EBIT is still predicted). One important question, would be what pasture consumption you would require to make this system work. Results suggest this farm system would require more than 11.5 t DM/ha consumed to appear an attractive investment.

BUYING AN OUTBLOCK FOR FODDER PRODUCTION:

A block of land adjacent to the case study farm may not be available for some time, so should the farm owners buy an outblock? This would mainly be used to produce silage/hay to feed out on the milking area.

The results of the analysis indicates that if the value of land is the same, buying an outblock will not be as economically attractive as buying milking area. In order to achieve the same return to additional capital, the outblock would need to be substantially cheaper than milking area.

RISK ANALYSIS

The comprehensive risk analysis used in this project is likely to favour a slightly less intensive system than analysis that has been based on averages. Analysis conducted using averages generally underestimates risk as it ignores the fact that high grain and hay prices and low pasture consumption (low rainfall) often occur in the same year (are correlated). Analysis with average prices also ignores the fact that supplementary feed prices are skewed - that is they are likely to go further above the average than below. This favours options that have a reduced reliance on purchased feed.

GIPPSLAND

More information on the results or analysis in Gippsland can be obtained by contacting Dan Armstrong (03 56 242 315) or Katherine Tarrant (03 56 242 238).

THE SOUTH WEST

Analysis started earlier this year on the first case study farm in the south west region of Victoria. Potential development options for this farm include decisions around leasing or purchasing land for milking area or for fodder production. More information on the analysis from the South-West is available by contacting Janna Heard at DPI Hamilton (03 55 730 936).

NORTHERN VICTORIA

The northern part of the project has been running for much longer than the other two regions, and has analysed a wide range of options. Lately, these have included a range of different feeding systems, labour saving devices and irrigation technology. The impact of a range of climate change scenarios on water allocations and farm system profitability is currently being analysed. More information on these projects can be obtained from the Murray Dairy website (<http://www.murraydairy.com.au/irrigated-dairy-farming-systems.html>) or by contacting Christie Ho at DPI Tatura (03 58 335 396).

In conjunction with the DPI policy team, the project has also been analysing the farm connection options for the Foodbowl Modernisation Program, and modelling the impact at the farm level. More information on this project can be obtained from Will Dalton at DPI Spring St (03 96 584 821).

ACKNOWLEDGEMENTS

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APPENDIX 1

Table 1. The strategies selected by 21 farm businesses in the North to deal with the milk price drop.

Method	Strategy 1	Strategy 2	Strategy 3	Strategy 4	Strategy 5	Total
Not applicable	3	5	7	12	15	42
Engaged consultant *	5	1	0	1	0	7
Revised cash flow budgets	4	4	3	0	0	11
Engaged accountant	0	1	1	0	0	2
Altered feeding regime	3	3	1	1	0	8
Altered feed contracts	0	1	1	0	0	2
Decreased business spending **	1	2	3	1	2	9
Swapped to once a day milking	0	0	0	0	0	0
Decreased cow numbers	0	1	0	0	1	2
Decreased paid labour	0	0	0	0	0	0
Sold water	0	0	0	0	0	0
Sold other assets	0	0	0	0	0	0
Refinanced loans	2	2	1	1	1	7
Decreased personal spending	3	1	4	5	2	15

Table 2. The strategies selected by 25 farm businesses in the South West to deal with the milk price drop.

Method	Strategy 1	Strategy 2	Strategy 3	Strategy 4	Strategy 5	Total
Not applicable	2	5	8	12	16	43
Engaged consultant *	4	0	1	0	0	5
Revised cash flow budgets	9	6	0	0	0	15
Engaged accountant	0	2	2	1	0	5
Altered feeding regime	2	4	1	0	0	7
Altered feed contracts	0	0	1	0	1	2
Decreased business spending **	4	6	2	4	0	16
Swapped to once a day milking	0	0	0	0	0	0
Decreased cow numbers	0	1	2	0	1	4
Decreased paid labour	2	0	3	0	0	5
Sold water	0	0	0	0	0	0
Sold other assets	0	0	0	0	0	0
Refinanced loans	1	0	1	2	1	5
Decreased personal spending	1	1	4	6	6	18

Table 3. The strategies selected by 22 farm businesses in Gippsland to deal with the milk price drop.

Method	Strategy 1	Strategy 2	Strategy 3	Strategy 4	Strategy 5	Total
Not applicable	0	3	6	11	17	37
Engaged consultant *	2	0	2	0	0	4
Revised cash flow budgets	5	1	2	1	0	9
Engaged accountant	0	0	0	1	0	1
Altered feeding regime	3	2	3	0	0	8
Altered feed contracts	0	0	0	0	0	0
Decreased business spending **	3	8	3	2	0	16
Swapped to once a day milking	0	0	0	0	1	1
Decreased cow numbers	3	1	1	0	0	5
Decreased paid labour	1	0	0	0	0	1
Sold water	0	0	0	0	0	0
Sold other assets	0	0	0	0	0	0
Refinanced loans	0	2	0	1	0	3
Decreased personal spending	5	5	5	6	4	25

*Engaged consultant or other professional advice ie nutritionist.

**Decreased business spending (other than feed).