



Can a dairy farm purchase all its forage?

Technical Note B01

Summary

This technical note examines if Total Mixed Ration (TMR) farms would still be profitable if they purchased all their forage requirements. A TMR farm produces its milk principally from a silage based mixed ration, fed on a pad, with little or no grazing.

The Queensland Dairy Accounting Scheme (QDAS) data for 2008-09 shows that as the percentage of home grown forage used increases and the percentage of purchased forage decreases, the gross margin per litre of sampled farms increased.

Modelling the expected financial impacts from changing a TMR farm to use no home grown forage, shows feed related costs will increase by 6.0c/l. Using 2008-09 QDAS data as a base, the margin over feed related costs will decrease from 24.9c/l to 18.9c/l.

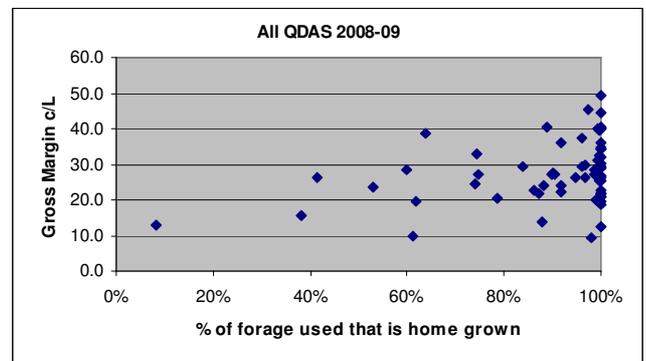
If milk prices remain at the levels modelled, it is possible for TMR farmers to be profitable (a return on assets of 5.6% in this analysis) when using no home grown forage. However, keep in mind that milk prices in this model are historically high.

The greatest risk to farmers of not using home grown forage is a loss of control from now relying on others to supply the quantity and quality of forage required. Farmers need strong personal and contractual relationships with the people supplying the forage.

The 6.0 c/l increase in feed related costs will make farms using no home grown forage more exposed to the effects of milk and feed price variations.

Analysis of QDAS data

The graph below shows the relationship between gross margin (c/L) and the percentage of forage used that was home grown, for the 67 Queensland farms who took part in QDAS in 2008-09.



A gross margin is calculated by subtracting variable costs from income, which is then divided by the number of litres produced on the farm. The percentage of forage used that was home grown has been calculated by dividing the litres of milk produced from home grown forage (including pasture) by the litres of milk produced from all forage (purchased and home grown).

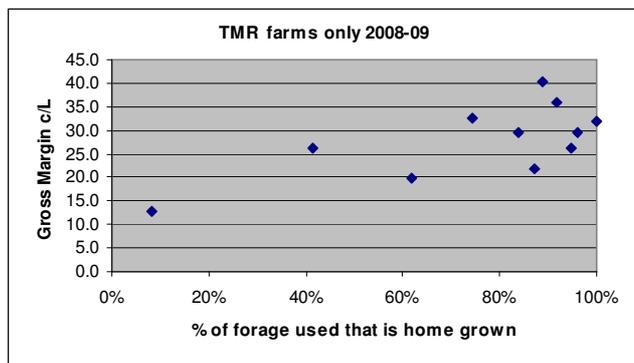
There are two interesting features of the graph. Firstly, there are many farms that only use home grown forage (predominantly pasture). These farms are represented by the large number of results on the right side of the graph, at or near 100% home grown forage.

Secondly, as the percentage of forage that is home grown increases, so does the ability of some farms to increase their gross margin per litre. However, due to management or circumstances, some farms still have low gross margins per litre, even when the percentage of their forage that is home grown is high.

There are many factors which will affect a gross margin per litre that farmers must manage, such as feeding, milking operations and herd health. Using large amounts of home grown forage will allow farmers to increase their gross margin per litre but it will not guarantee it.

To further investigate the relationship between gross margin and home grown forage use, the analysis has been repeated for TMR farms only. By investigating TMR farms only, the effect of pasture is removed and more importantly, the TMR farms have the ability to change to one hundred percent purchased forage without changing their feeding system.

The graph below shows a clearer pattern that on the TMR farms, as the percentage of forage that is home grown increases, so does gross margin per litre. This increased gross margin per litre should lead to increased profit, if labour and overheads are managed well.



However, farmers may not have land available to grow forage or they may wish to stop growing forage and concentrate their efforts on herd and labour management. So the question remains, "Can a dairy farm be profitable if it buys all its forage requirements?"



Modelling 100% purchased forage

To model the profitability of purchasing one hundred percent of forage requirements, the 2008-09 QDAS average of 11 TMR farms was used as the base values. The aim of this analysis is not to examine the profitability of intensifying a farming system, but to examine the cash flow impacts on existing TMR farms, if they choose to buy all their forage requirements rather than grow all or part of their forage.

The table below shows some of the indicators for the TMR average farm that has been used as a base. The full analysis of these TMR farms is contained in the 2008-09 QDAS report and can be found at www.dairyinfo.biz.

Cows (milkers + dry)	215
Production per cow (L)	7,649
Milk production (L)	1,641,725
Milk receipts(c/L)	58.8
Feed related costs (c/L)	33.9
Gross margin (c/L)	27.3
Return on assets – operational (%)	9.1

Forage requirements

The table below shows the feed source for milk production for the TMR average farm. The majority of milk is produced from concentrates (eg grain and protein meals), 35% of milk is produced from home grown forages and 13% from purchased forages. This means that 73% of the total forage consumed on-farm is home grown forage.

Feed source	Litres	
Home grown forage	35.1%	576,051
Purchased forage	12.8%	210,155
Purchased concentrates	52.1%	855,519
Total		1,641,725

For this average TMR farm to now produce the same amount of milk with no home grown forage and the same amount of concentrates, it has been calculated that an extra 2,332 t of forage sorghum silage and 132 t of medium quality hay will need to be purchased.

Extra cash costs

It has been assumed that farmers would still pay for the cost of making and storing silage, just as they did when they made it on their own farm. The extra costs are the purchase of the 2,332 t of silage and the cost of trucking the silage to the farm. The 132 t of hay would be purchased on the open market. The extra cost to the TMR average farm would be \$127,226. See details below.

Extra Costs		
Purchase sorghum silage	@ \$35/t	81,620
Extra trucking costs	@ \$10.50/t	24,486
Purchase medium hay	@ \$160/t	21,120
Total costs		\$127,226

Cash savings

Savings result from not having to plant crops to produce silage and hay plus not having to pay a contractor to make hay. To calculate this saving it has been assumed that the crop would have been 115 ha of minimum till dry land forage sorghum. The total savings are \$30,380.

Net effect

The net effect of this change is an increase in feed related costs of \$96,846. If no changes are made to the farm operation or land ownership, the margin over feed related costs would reduce by 6.0 c/l from 24.9 c/l to 18.9 c/l and return on assets would drop from 8.9% to 5.6%. The effects of this change on financial indicators are shown below.

	With 35% of milk from HG forage	With 0% of milk from HG forage
Purchased feeds(c/L)	24.2	30.5
Feed related costs (c/L)	33.9	39.9
Margin over feed related costs (c/L)	24.9	18.9
Total variable costs (c/L)	36.4	42.4
Gross margin (c/L)	27.3	21.3
Dairy operating profit (\$/cow)	1,253	774
Return on assets – operational (%)	8.9	5.6

Sensitivity analysis

There are many variables that will affect the outcome of this analysis. A significant factor that the farmer may have influence over is the distance from which the forage is sourced. The extra cost of trucking silage has been estimated at \$24,486 or 1.4c/l. Changes to the distance this silage needs to be sourced from will significantly change feed related costs.

Two other significant variables are firstly climatic conditions, which will affect the price of purchased silage and hay, and secondly, milk price that will not affect feed related costs, but will affect cash flow and the ability of farmers to continue operating at higher feed related costs than if they used predominantly home grown forage.

The tables below show the effect that changes to milk price and the price of purchased silage and hay have on the margin over feed related costs of the original TMR average farm and the TMR modelled farm that purchases all its forage needs. The shaded areas of these tables show when the margin over feed related costs falls below 17.7 c/l, which is the result required to achieve a return on assets of 5% (in this TMR average farm).

Margin over feed related costs (c/L) of the TMR average farm with 35% of milk from HG forage					
Milk price c/L	% Change in purchased feed costs				
	-20%	-10%	0	+10%	+20%
50	20.9	18.5	16.1	13.7	11.2
55	25.9	23.5	21.1	18.7	16.2
58.8	29.7	27.3	24.9	22.5	20.0
60	30.9	28.5	26.1	23.7	21.2
65	35.9	33.5	31.1	28.7	26.2

Margin over feed related costs (c/L) of the TMR modelled farm with 0% of milk from HG forage					
Milk price c/L	% Change in purchased feed costs				
	-20%	-10%	0	+10%	+20%
50	16.2	13.2	10.1	7.0	4.0
55	21.2	18.2	15.1	12.0	9.0
58.8	25.0	22.0	18.9	15.8	12.8
60	26.2	23.2	20.1	17.0	14.0
65	31.2	28.2	25.1	22.0	19.0

Other costs and savings

The analysis thus far has only considered the cash costs and savings of a change to one hundred percent purchased forage. It is not the aim of this report to calculate the dollar values of all the other effects of this change, but they will be noted in this section.

Opportunity cost of not using land to grow forage

There are significant opportunity costs and benefits to farmers from not using land, that is owned, to make forage. Other enterprises could be run on this land, it could be leased or it could be sold. Selling the land would generate a significant capital inflow that could be used to invest on farm or off farm, or to reduce debt. However, the ownership of land generates significant capital gains in its own right.

Time and labour costs and savings

There are paid or unpaid labour savings from not planting the forage crop. On the other hand there could also be extra managerial time required to build and maintain relationships to source the silage and hay required.

Risk and quality

A significant cost of the change to one hundred percent purchased forage is the loss of control farmers have when growing their own crop. They now have to trust that the crop will be grown well and supplied when required and to the quality required. The opposite could also occur if a dry land farmer is now sourcing forage from an irrigated farm, giving potentially more control over silage quantity and quality.



Further information

Contact the DAFF Customer Service Centre by Phone 13 25 23, or

Email callweb@daff.qld.gov.au

More technical notes and QDAS reports can be found at: www.dairyinfo.biz

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