

# Farm Business Analysis “The Heart of Profitability”

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A Farm Advice Sheet from **SowtheSeed**

## **Introduction**

With every day that goes by the outlook for the dairy industry looks more uncertain. To most of us the financial situation is complex with everything changing at an incredible pace. Making the right decisions to adapt in these turbulent times will help you manage the situation to your best advantage.

In these challenging times, understanding the present position of your business and identifying pathways to improving business performance can be critical. This requires that you regularly review performance and analyse potential scenarios for improvement.

The major issue confronting dairy business owners is that they manage one of the most complex businesses on the planet. Pasture-based dairy farming is governed by multiple curvilinear relationships related to pasture and animal production, meaning that either too little or too much of most inputs causes drops in performance. This means one of the ‘arts’ of top dairy performance is akin to sitting on a finely balanced fence, where moving in either direction with the use of inputs can result in a rather sudden ‘let down’.

Another issue is that dairy farming has a very high proportion of variable costs. Most significant management decisions are likely to result in 75%-95% of all costs being affected. This means the more common management tools of gross margin analysis or variable cost analysis have almost no application. In reality, if dairy business owners are not prepared to engage in full farm business analysis, then they are likely to be better off undertaking no analysis of any type and just sticking with gut feel and instinct decisions.

However, full business analysis does provide the opportunity to unlock the potential of every dairy business. This analysis should:

- Identify the strengths and weaknesses (areas of greatest opportunity) of your business.
- Provide the pathway to making faster and more consistent progress.
- Secure the support of all stakeholders behind an agreed business plan.
- Provide a comprehensive plan for financiers.
- Provide focus and confidence for the future.

A mix of both financial and physical measurements is the key to analysing business performance and designing business plans. Along with producing ratios that determine return on capital and equity, there is a need for ratios that determine debt level and equity growth, cash movement and degree of risk. On the physical side there is a need for ratios that describe animal performance as well as calculations of pasture harvest and feed costs split between pasture, forages and concentrates. There is also a need for a number of staff ratios that indicate level of performance in this area. You can read more about full farm business analysis at [Intelact Business Consultancy](#).

Understanding how quickly your profit can either increase or decrease due to changes in your trading conditions is also an important factor in managing your farm business. For instance knowing the effect of any change in milk price or other product price, feed price or interest rate on your level of profit is to understand the degree of risk in your business.

Changes to your business can be prompted by comparing your own performance with your peers, especially other farmers who are performing at a high level. NZ benchmarks are available here: [Red Sky NZ Benchmarks](#) and Australian benchmarks at [Red Sky AUS Benchmarks](#). Other opportunities for

change can be determined by recording your progress level over time and then using this analysis as a spring-board to developing an improved budget and farm business plan.

A farm business analysis is one component of a larger farm planning model that covers:

- Developing a vision and determining medium term goals.
- Determining the present position of the business (i.e. full farm business analysis).
- SWOT analysis of the business, including benchmarking business against peers.
- Developing a plan to move forward including:
  - testing scenarios,
  - completing a sensitivity analysis,
  - developing cash flow budgets.

### **Critical Numbers to Monitor in Your Business**

It is critical to the future success of your business that you find measures that record your level of profit, efficiency, risk, solvency, and liquidity.

There are 5 ratio categories:

- Profit - return on money invested
- Efficiency - the building blocks of profit
- Risk - the degree of sensitivity to change
- Solvency - confidence in meeting financial obligations as they fall due
- Liquidity - cash generated to sustain business.

### *Key Performance Indicators*

- Profit ratios: “bigger is always better”
  - Return on Capital = Operating Profit (excluding lease costs) divided by Value of Assets ‘Employed’ (Owned & Leased) in Business
  - Return on Assets = (Operating Profit minus Lease Costs) divide by Value of Owned Assets
    - Return on Equity = (Operating Profit minus Financing Costs) divided by Equity in Business
  - Operating Profit per Hectare
  - Operating Profit per Cow (useful for sharemilkers/sharefarmers in particular)
- Efficiency ratios: not consistently correlated to profit i.e. there are tipping points where pushing the ratio too far will lead to a reduction in profit
  - Milk production, which is a function of stocking rate and milk production per cow
  - Pasture harvest (kgsDM per hectare)
  - Feed costs: pasture, forage and concentrate costs (\$/tDM including purchase, variable and capital cost components)
  - Labour efficiency (cows per 50-hour full time staff equivalent, management plus staff costs per cow)
  - Core cost structure including Core per Cow Costs and Core per Hectare Costs
- Risk: “higher or lower”
  - Operating Profit Margin – the % of each dollar earned that is retained for debt servicing, principle repayments, tax & ‘true’ profit
  - Cost of Production – Gross expenses (less livestock & other revenue) / kgMS produced
- Solvency
  - Equity %
  - Financing Costs as % of Gross Farm Revenue
- Liquidity
  - Change in Working Capital
  - Operating Surplus (operating revenue – operating expenses)

### Relationship between Production, Profit & Risk

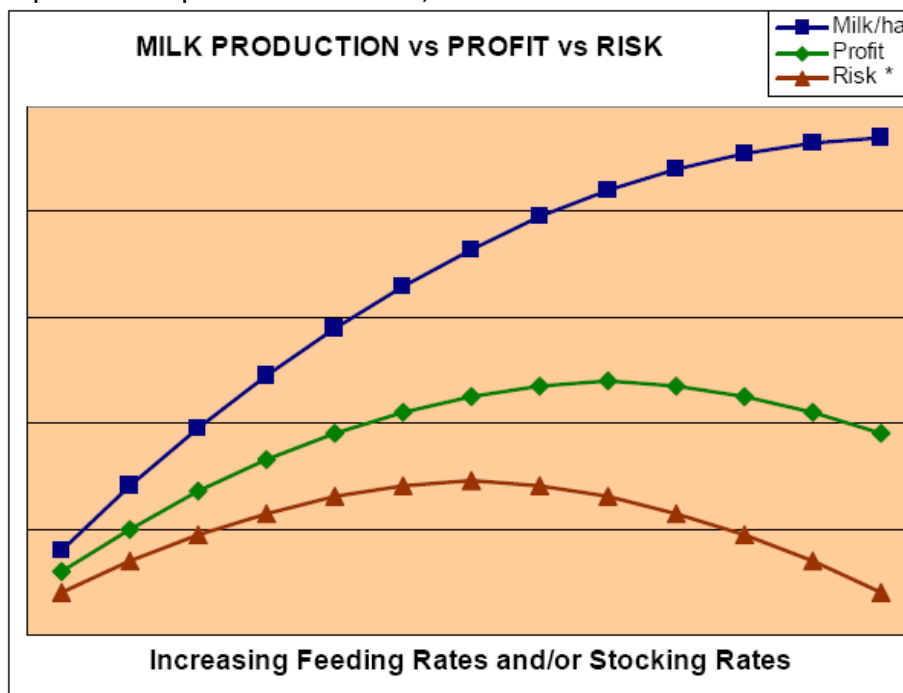
Understanding the relationship between the production system you choose to adopt and the resulting profit and risk profile of your business is critical.

Farm systems that increase milk production per hectare by a combination of increasing levels of milk produced per cow and cows milked per hectare (stocking rate) move through a number of 'levels'. When a farm with a very low output of milk per hectare increases milk production, there is often an increase in profit. As milk produced per hectare increases further, it reaches a point where there is a low correlation to increasing profit, which is to say that if profit does increase then it is due to other factors being well managed in the business i.e. a low cost structure being maintained or additional lifts in pasture harvest. Then as milk production lifts further, there will come a point where profit decreases i.e. where the cost to produce the next kg of milk exceeds the price gained for that kg.

There is a similar response curve with risk. When a farm with a very low output of milk per hectare increases milk production, there is often a decrease in risk. As milk produced per hectare increases further, it reaches a point where there is a low correlation to decreasing risk, which is to say that if risk does decrease then it is due to other factors being well managed in the business i.e. a low cost structure being maintained or additional lifts in pasture harvest. Then as milk production lifts further, there will come a point where risk increases.

This risk curve has its tipping point at a lower level of production than the profit curve, so that the farm system with the lowest risk produces less milk per hectare than the farm system producing the highest profit. This relationship is illustrated in the graph below where the risk graph may appear inverted as we have used Operating Profit Margin as our risk ratio. This means that the highest point on the red risk curve is the point at which the business has the highest profit margin i.e. keeps the highest proportion out of each dollar earned.

Graph 1: Relationship between Milk Production, Profit and Risk



\*Risk = Operating Profit Margin, therefore Higher figure = Lower risk

For all farm businesses there will be a point on the production curve where the owners of the business will set their goal result. Some will prefer to be closer to the minimum risk point and others at the maximum profit point. As milk prices or major input costs change, the optimum profit and risk points move. So besides there being a need for business owners to pick a point on the production curve that suits their profit and risk profile goals, they also need to "make a call" as to where milk prices and cost centres are heading in the coming year(s).

### **Key Profit Drivers in a Pasture System**

There are 5 key profit drivers in pasture based dairying. These include:

#### ***Pasture Harvest***

- Measured as “tonnes of pasture dry matter harvested per hectare”
- The cost of pasture is heavily influenced by the amount of pasture harvested per hectare
- Increasing pasture harvest usually reduces the cost of pasture
- Reducing the cost of pasture reduces the average cost of feed and the Cost of Production
- Read more in the Jan 2010 FAS [Maximising Pasture Harvest](#).

#### ***Milk Production***

- Measured as “milk (kgMS or litres) produced per hectare”
- The **least** reliable profit driver!!
- Milk production has the highest capacity to be misinterpreted. This is due to there being a “tipping point” where increased levels of milk production will result in firstly a higher level of risk and then secondly a reduction in profit. These two “tipping points” occur at different points on the milk production curve.
- Milk production can be increased from stocking rate and/or milk production per cow
- A higher pasture harvest provides the opportunity for increased milk production
- Moderate to high stocking rates plus moderate milk production per cow are a feature of high profit farms
- Low stocking rate or low milk per cow is NOT a feature of high profit farms
- Very high stocking rate and very high milk per cow not required

#### ***Supplementary Feed Costs***

- Measured as “forage cost per tonne dry matter consumed” and “concentrate cost per tonne dry matter consumed”.
- Forages have more elasticity -
  - Home grown forages are the biggest opportunity, providing crop yields are good.
- Concentrates have less elasticity -
  - Choice of feeds, including lower protein sources, are important.
  - Diets must not be over-specified with protein and minerals/vitamins/additives.
- The full cost of forage is on average at least 50% greater than their purchase price. If significantly more than this, then either the level of **variable and capital costs** or **wastage** is an issue.
- Concentrates costs on average are 15%-30% greater than their purchase price. If no significant amount used, the average cost is often high due to this being for high-cost calf meal.

Although it is important to understand the role of nutrition and the effect of the varying composition of feeds to cow performance, the primary influence of supplementary feed on profit is the cost of these forages and concentrates. As with pasture this includes the purchase price (which should include any storage costs) plus the variable costs and capital costs. In addition the effects of wastage must be quantified, including both storage/bunker wastages and losses in delivery of the feed to the cows.

The most significant opportunity in pasture based dairying to reduce the cost of forages is to produce the forage on an area controlled by the business e.g. the milking platform or an owned/leased support block. Crop yield is the second major opportunity to reduce forage costs.

In the case of concentrates there is often less opportunity to produce these as home grown feeds. There can still be significant opportunities through astute purchasing decision. In addition there are often opportunities to reduce the effective cost of concentrates through eliminating potentially excessive use of protein, minerals, trace elements and other additives.

#### ***Labour Efficiency***

- Expressed as cows per 50-hour (per week) full time staff equivalent (FTE)
- There can be high efficiency in all systems BUT we do see higher labour efficiency on average where pasture fills a higher percentage of the overall diet

- Capital improvements may play a role by providing the opportunity to increase profit
- Organisation of people around milking and feeding routines are critical

Labour efficiency is significantly elastic in that there is a wide variation in performance. For instance, in both New Zealand and Australia the average level of performance is most commonly 120-140 cows per full time staff equivalent, with the top 10% of farmers running 160-180 cows. However there is also a number running over 200 cows per full time equivalent which provides a window into a major opportunity for many farmers to lift profitability.

Although it may appear obvious that farms feeding higher amounts of supplement would have lower labour efficiency, it would be incorrect to assume that these farms cannot have very high levels of labour efficiency. There are a significant proportion of highly supplemented farms that appear in the top 10% in this area. On closer examination of these farms it might be reasonable to conclude that the most critical factor in labour efficiency is whatever is “above the neck” of the business owner/operator. Again this ensures that labour efficiency is one of the most significant opportunities for lifting profitability on pasture based dairy farms.

### **Core Costs**

- Measured as “farm operating expenses excluding nitrogen, supplementary feed, irrigation costs and labour per cow and per hectare”.
- System costs – such as nitrogen fertiliser, supplementary feed, irrigation costs and labour are excluded from this measure for two reasons:
  1. So different farm systems can be compared on the same basis; and
  2. The two major costs in any business, supplementary feed and labour, have already been assessed with their own stand-alone profit drivers and their inclusion would distort the impact of the other farm expenses in the Core Cost ratios.
- The level of core costs confirm the focus of the operator.
- Cost control is a feature of all top businesses.
- The high proportion of variable costs in a dairy business increase the requirement for cost control.
- The expenses included in the Core Cost ratios are NOT farm systems related.
- You are looking for costs that are more ELASTIC when trying to control costs.
- For instance, fertiliser costs are INELASTIC. If recommendations were scientifically based there would be very little opportunity to reduce the cost of fertiliser over time if you are to adequately maintain soil fertility.
- The base cost structure will be regionally specific.
- In general the best farmers have the lowest cost structure.

The level of core costs on pasture based dairy farms often define the farm in that the control of core costs is an integral part of high profit farms. When the core costs are compared on a per cow basis, high profit farms normally have a lower cost structure than other farms even though they will often have a higher level of milk production.

Pasture based dairying has a high proportion of variable costs in that these variable costs normally constitute 75%-95% of operating expenses. In a high variable cost business there are not significant opportunities to increase revenue (i.e. milk production) to “water down” the impact of high costs. Effectively businesses with a high proportion of variable costs have no alternative but to control costs if they are to be significantly profitable.

### **Cost of Production**

To improve cost of production you need to do one or more of the following:

- Produce similar amounts of milk off a lower cost base.
- Produce less milk off a significantly lower cost base.
- Increase the percentage of pasture in the diet.
- Increase the efficiency of production.
- Reduce costs in all areas that do not undermine pasture and milk production.

## Opportunity Map or “DOT” Report

The Opportunity Map or “DOT” Report gives a pictorial representation of the performance of the business compared to its peers for each of the Key Performance Indicators (KPI’s) and Key Profit Drivers (KPD’s).

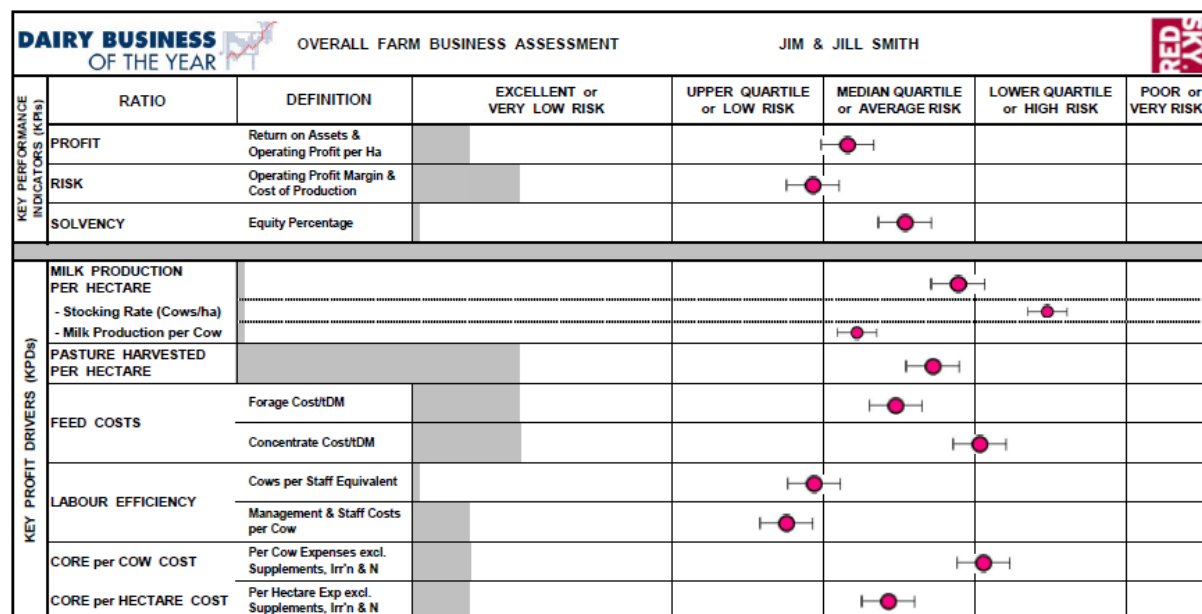


Figure 1: DOT Report

### Key Performance Indicators Section

The **top three lines** of the report are reflecting the Key Performance Indicators. By looking at these three lines you can get an overall picture of the business, including the level of profitability, risk and solvency.

When the profit DOT is stronger (i.e. more to the left) than the risk DOT, this indicates that this business has a stronger focus on production compared to cost control.

When the profit DOT is weaker (i.e. more to the right) than the risk DOT, this indicates that the business has a stronger focus on cost control rather than production.

Neither is right or wrong, providing both DOTs are within an acceptable range. A very low profit is not sustainable no matter how strong the risk DOT is. Alternatively a very high profit DOT with a weak risk DOT (e.g. the farm system is very risky) is not ideal in a market with high volatility. Such a system does well in high milk price years but is severely hit when the milk price goes down.

This is clearly illustrated by the confinement/feedlot dairy systems in the USA. These systems are high cash flow but low margin businesses and can be very profitable with high milk prices (and/or low feed prices), but when milk prices drop substantially and/or feed costs increase, these systems are very vulnerable. The “good times” quickly reverse to “bad times”.

### Key Profit Drivers Section

This area is split into 5 key ‘drivers’ of profit:

- **Milk production**, which is a function of:
  - Stocking Rate
  - Milk production per hectare
- **Pasture harvest** – kgsDM per hectare

- **Supplementary feed costs.** This is split into two -
  - Forage costs
  - Concentrate costs
- **Labour efficiency.** This is represented by two ratios:
  - Cows per Full-time Staff Equivalent (FTE)
  - Management & staff costs per cow
- **Core costs.** These are the non-system costs related to running the farm and are split into two ratios which are based on how the expense is influenced.
  - Core per Cow
  - Core per Hectare

The KPD section highlights which of the 5 areas are weakest in the business and hence offer the most potential for improvement in performance and profitability.

Generally, when the DOT is to the **left** it indicates that the driver is a **strength**. If the DOT is to the **right** then this provides an **opportunity** to improve profitability.

DOT to **LEFT** = **STRENGTH**  
 DOT to **RIGHT** = **WEAKNESS/OPPORTUNITY**

*Exceptions:*

- **Milk Production:** This is the one KPD where continuing to push towards the extreme left of the scale is actually likely to decrease profitability. When any of the 3 milk production dots are at the extreme left it is often an indicator that the point of profit optimisation has been exceeded.
- **Concentrate costs:** When the concentrate cost DOT is to the right (indicating it is a weakness), the **quantity** of concentrates fed must be checked. In a predominantly pasture/forage based system the only concentrates purchased is calf meal, which is expensive on a \$/t basis, but the volume is so small it is not significant in the system.
- **Core per Hectare cost:** This is the one KPD what will often have its DOT out to the right with high performing businesses.

### Summary

The most profitable pasture based farming systems generally exhibit 5 key qualities:

1. Pasture harvest levels 15%-25% above the average
2. Milk production per hectare 15%-30% above the average
  - a. Stocking rate that is 10%-20% above the average
  - b. Milk production per cow 5%-15% above the average
3. Supplementary feed costs 5%-20% below the average, made up from:
  - a. Forage costs 5%-25% below average often as a result of a higher proportion of home grown rather than purchased forage
  - b. Concentrate costs 5%-15% below average often as a result of astute purchasing policies and lower use of protein/minerals/additives
4. Labour efficiency 10%-30% above average
5. Core costs on a per cow basis 5%-15% below average
6. Core costs on a per hectare basis similar to or above average

It is not possible to describe what this system “looks like”. This is due to the fact that the numerous curvilinear relationships governing animal production and pasture production mean that there are also numerous variations to pasture based farming systems that can express the same result in terms of profit. This is further complicated by the influence the key operator of a pasture based dairy business exerts on the final level of profitability, which can mean that two operations on near identical farms using the same resources in both livestock and feed will consistently produce substantially different results.

Finally, the most profitable pasture based farming system will look different between countries and between districts within countries, as well as within districts in countries, depending on milk price, potential pasture growth, supplementary feed price and base cost structure. This will mean that the optimal position on Graph 1 for milk production, profit and risk as well as the “tipping point” on the profit and risk graph will vary for every dairy business.

If this does all sound too complicated, the diagram below is designed to reduce the key principles of pasture based dairy farming back into some critical key elements and steps that are required if you want to be a high profit farmer.

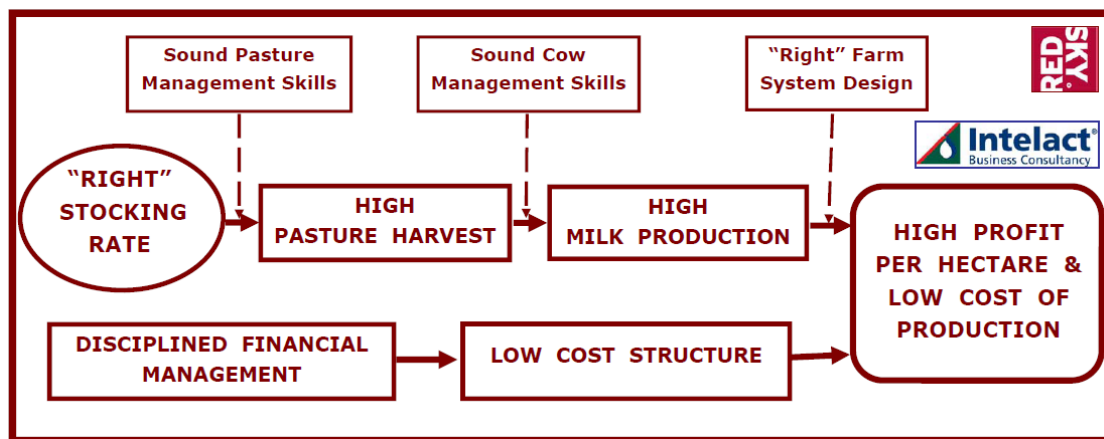


Figure 2: Flow diagram of the key components necessary for achieving high profitability on pastoral-based dairy farms

The flow diagram above is designed to highlight there are two ‘levers’ that must be ‘driven’ in your business. The first lever must be ‘pushed’ hard forward as it is the output or revenue lever. To do this you must first set the ‘right’ stocking rate for your farm as this provides the mouths to harvest a heap of pasture. Without the ‘right’ amount of mouths there is no opportunity to harvest a lot of pasture.

By imposing sound pasture management skills on the ‘right’ number of cows, high pasture harvest will result. If you also impose sound cow management skills, then the high pasture harvest will be converted into a high amount of milk, and with a soundly designed farm system this will produce a heap of revenue from a moderate feed cost.

The second lever must be ‘pulled’ hard back as it is the input or cost lever. To do this you need to exert disciplined financial management and tight cost control. This ensures the cost structure of the business is low.

The combination outlined above produces a heap of pasture and milk off a low cost base and drives a wedge between revenue and expenses. This is the outcome required to be a high profit farmer operating off a relatively low cost base i.e. with a relatively low level of risk.

If you have any further questions please contact your Intelact consultant or call Intelact Head Office on 0800 735 588.