

Opportunities to maximise livestock profitability

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Abstract: *The profitability of livestock enterprises is driven by optimising wool and meat production and producing it at a low cost of production. However, there is enormous variability in the profitability of livestock enterprises. The management system should be set up so that livestock demand fits the pasture growth curve to optimise pasture utilisation and ensure genetics, animal health, flock and herd structure maximise profitability. As much as possible, all enterprises should complement each other. All these elements can be managed.*

Keywords: Profit, lamb, beef production, investment, efficient

Introduction

This paper outlines the opportunities to optimise sheep and beef cattle production from mixed livestock enterprises and maximise farm profitability. There is an enormous variation in the profitability of sheep (wool and sheep meat) and beef producers in south eastern Australia. Management is the key to increasing profitability.

Regardless of the region, the features that drive profitability are similar. Generally, the most profitable farms generate more income per hectare, which drives higher profits. The most profitable farms usually produce more wool, lamb and beef per hectare, but at a lower cost of production. They achieve this by adopting simple proven management systems, grow more grass and utilise it through higher stocking rates and profitable enterprises. The most profitable producers understand the profit drivers, monitor their business performance and match the relationship between pasture growth and stock demand.

Discussion

What's going on with farm performance?

According to ABARE farm surveys, the average return on capital has fluctuated between -0.5% and 4% since 1993. Between 2000 and 2007 return on assets (including capital appreciation) ranged from 7-10% due to large increases in land values in this period. Since 2008 land

values have been static or declined and the total return on capital has ranged between 1-2%.

A more detailed examination of livestock farm performance is available from examining the results of the Victorian livestock Farm Monitor Project that has been running since 1971. Farm income has been steadily rising since the early 1990s as has farm enterprise costs. In real terms, overhead costs have remained remarkably stable. Over the long term, net income closely follows gross farm income. In the last two financial years, farm gross income decreased in response to lower commodity prices and poor seasonal conditions. This follows a period of excellent returns with good commodity prices and good seasonal conditions

Figure 1 shows the average performance of south west Victorian farms in the Victorian Department of Primary Industries' Farm Monitor Project over the last 44 years.

The return on assets and return on equity for farms in the group follow a very similar pattern. In recent times low return on assets has been partly explained by escalating land prices.

Figure 2 shows the long term return on assets and return on equity for farms in the South West Farm Monitor Project.

Overall figures do not explain the important features of profitable farms, but closer analyses of farms show some key features that drive profitability. The most obvious feature is that the most profitable farms (based on return on assets) tend to generate higher gross income per hectare due to higher stocking rate and enterprise profitability. They have similar

costs to the average farm, although finance costs are often higher on the top 20% of farms. They invest more in pasture growth and less on supplementary feeding and overhead costs are lower too. Table 1 compares the overall performance of the average and top 20% of farms in south west Victoria. The same relationship exists in Gippsland and north east Victoria, which have with different climatic conditions.

Table 1. Comparison of average and top 20% performance of livestock farms in South West Victoria Farm Monitor Project (2013–14).

\$/ha	Average	Top 20%	Difference
Gross income	\$608	\$907	+\$298
Enterprise costs	\$252	\$261	+\$ 9
Gross Margin	\$356	\$645	+\$289
Overhead costs	\$141	\$154	+\$ 21
O/O labour	\$ 64	\$ 84	+\$ 20
Operating return	\$142	\$391	+\$249
Interest and Lease costs	\$ 79	\$191	+\$111
Net Farm Income	\$ 62	\$200	+\$138

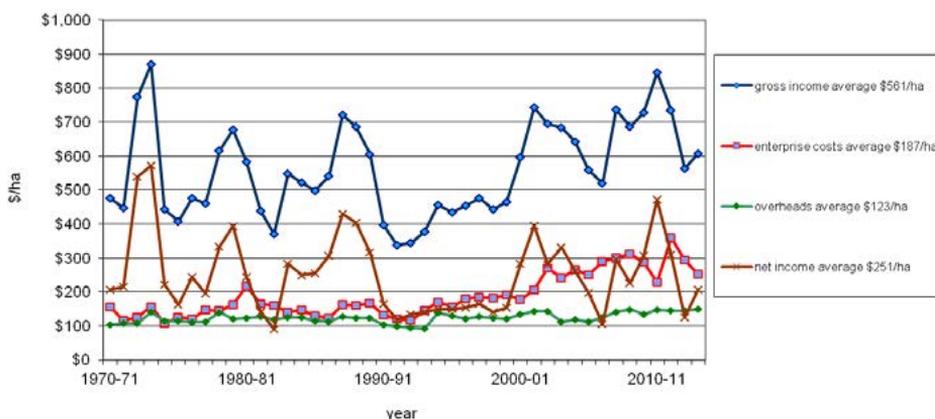


Figure 1. Historical average performance of farms in the South West Victoria Farm Monitor Project (figures are adjusted for inflation and converted to 2014 dollars).

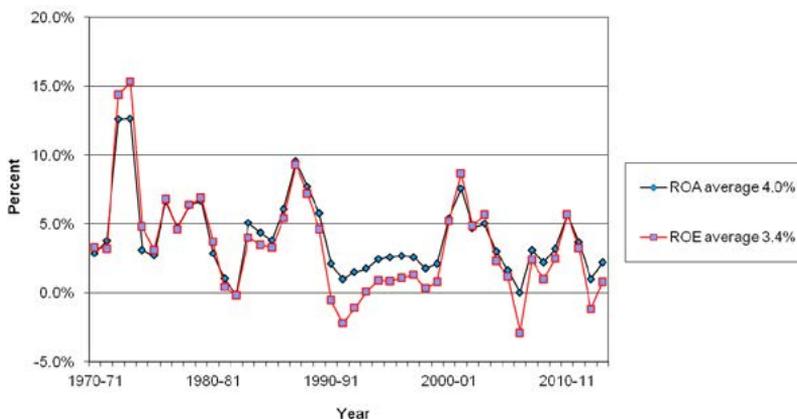


Figure 2. Historical return on assets and return on equity of farms in the South West Victoria Farm Monitor Project (1971–2014).

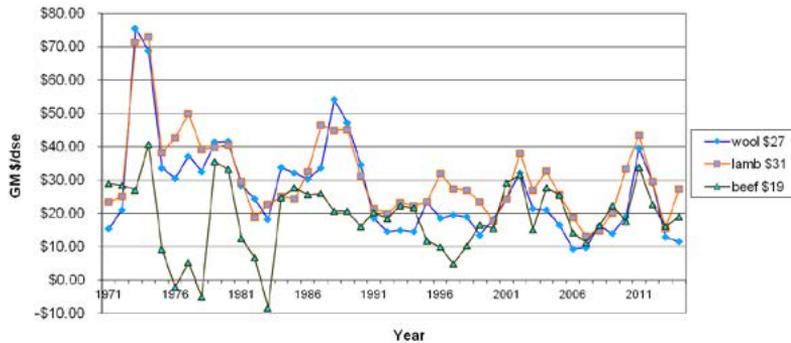


Figure 3. Enterprise performance of livestock enterprises in South West Victoria Farm Monitor Project (real \$).

Over the last 44 years that the South West Farm Monitor Project has operated, a comparison of beef, wool and prime lamb enterprises has been run on an annual basis. Over the long term, prime lamb flocks have been the most profitable, closely followed by wool. However, in recent years beef has performed at a similar level to wool flocks. Figure 3 shows the comparative performance of prime lamb, wool and beef enterprises on a gross margin \$/DSE basis.

A comparison of averaged enterprise performance over the last 44, 10 and 5 years on a gross margin \$/DSE basis is shown in Table 2. What the averages do not reveal is the enormous range in enterprise performance of all livestock enterprises, ranging from mediocre to highly profitable in all enterprises. Clearly, producers can make money in all enterprises as long as they manage the enterprise well.

Table 2. Summary of livestock enterprise gross margin \$/DSE in south west Victoria for the last 44 years, 10 years, 5 years and 1 year.

	Wool	Prime lamb	Beef
Average 44 years	\$27.00	\$31.05	\$18.84
Average 10 years	\$17.86	\$24.19	\$19.93
Average 5 years	\$22.49	\$29.84	\$21.90
2013–14	\$11.64	\$27.32	\$19.02

On closer examination of wool, prime lamb and beef enterprises, some consistent features highlight the performance of the top 20% of enterprises compared with the average livestock enterprise. The top 20% of enterprises usually

run a higher stocking rate, both in terms of DSE/ha and DSE/ha/100 mm rainfall. They run higher stocking rates partly by better pasture utilisation (although utilisation has not been measured) and partly because they grow more grass and apply higher rates of fertiliser. They also tend to spend less on supplementary feed, partly through more efficient use of resources and partly by adopting production systems such as spring calving/winter-spring lambing that rely on less supplementary feed and better utilise pasture resources.

As a consequence of running higher stocking rates the more profitable farms produce more wool and meat per hectare (or per ha/100mm rainfall). Labour and overhead costs are spread out over more kilograms of beef, lamb and wool per hectare. Therefore, wool and meat is produced at a much lower cost of production meaning that the more profitable farms generate higher profit margins regardless of commodity prices. Historically, there has usually been no clear relationship between the average and top farms with regard to sale weight or sale price of surplus stock. However, in recent years the top 20% of farms has been selling their stock at a higher price per kg, indicating they have better marketing strategies and are better at meeting market specifications.

Tables 3, 4, 5 and 6 provide a comparison of some of the physical and financial features for the average and top 20% of farms in north east Victoria and south west Victoria. Similar patterns are evident in all regions of Victoria.

Table 3. Livestock enterprise benchmarks in north east Victoria (2014).

	North east Average farm	North east Top 20%
Stocking rate DSE/ha	9.8	11.4
Stocking rate DSE/ha/100mm	1.5	1.6
Kg P/ha	6	9
Kg P/DSE	0.60	0.76
Pasture costs \$/ha	\$32	\$53
Pasture costs \$/DSE	\$3.30	\$4.53
Labour efficiency DSE/labour unit	5,800	8,100
Return on assets	2.0%	6.0%

Table 4. Livestock profitability indicators – Beef (2014).

	North east average farm	North east Top 20%
Gross margin \$/DSE	\$26	\$58
Gross margin \$/ha	\$317	\$780
Beef production kg/ha LW	232	340
Beef production kg/ha/100 mm	33	46
Sale weight kg liveweight	425	458
Sale price \$/kg liveweight	\$1.63	\$1.85
Breakeven COP price \$/kg liveweight	\$1.46	\$0.84
EBIT \$/kg	\$0.35	\$1.12

Table 5. Livestock profitability indicators – Lamb (2014).

	South West average farm	South West Top 20%
Gross margin \$/DSE	\$27	\$43
Gross margin \$/ha	\$428	\$726
Lamb production kg/ha CW	99	153
Lamb production kg/ha/100 mm	13.9	21.2
Sale weight kg carcass weight	20.1	20.6
Sale price \$/kg carcass weight	\$4.73	\$5.18
Breakeven COP price \$/kg carcass weight	\$3.24	\$2.58
EBIT \$/kg CW	\$2.23	\$3.32

Table 6. Livestock profitability indicators – Wool (2014).

	North east average farm	North east Top 20%
Gross margin \$/DSE	\$23	\$27
Gross margin \$/ha	\$234	\$399
Wool production kg/ha clean	22	30
Wool production kg/ha/100 mm	3.2	4.0
CFW kg/hd	3.1	2.6
Average micron	18.0	17.0
Wool sale price \$/kg clean	\$10.66	\$12.10
Sheep sale price \$/hd	\$63	\$56
Breakeven COP price \$/kg clean	\$8.56	\$6.04
EBIT \$/kg clean	\$2.74	\$6.46

Management systems that drive farm profit

There are a huge variety of reasons why the top 20% of farms are more profitable. The basic farm resources do not guarantee that these farms will perform best; rather it is how those assets are managed. The best farm managers have three consistent features: (i) they understand the profit drivers of their livestock enterprise; (ii) they monitor their business performance; and (iii) they understand and fit the relationship between pasture supply and livestock demand.

The first step to improve farm profitability is to ensure the enterprise is run efficiently. Initially this includes setting up a farm plan with clear goals on the direction of the business. This plan should be constantly reviewed with opportunities for improvement critically analysed and adopted where returns are acceptable. The type of enterprise and management system should be the most profitable for available resources. The next step is to utilise existing pasture by setting the stocking rate to optimise production and maximise profit without placing the business at too much risk, both financially and environmentally. The next step is to invest in growing more grass, initially by ensuring that soil nutrients are not limiting and then by investing in new, high performing, high quality

pasture species – provided the marginal gain justifies the investment.

Enterprise mix

When prioritising investment on farm, the first step is to ensure the enterprise(s) run are the most profitable for available resources. This includes which type of enterprise should be run for a specific market whether it be breeding or trading, and ensuring it is run efficiently. Given there is enormous variation in enterprise profitability an important first step is to optimise the proportion of the most profitable enterprises. Consideration should be given to both likely returns over a range of commodity prices, capital required, physical resources and the suitability of the farm enterprise when considering labour and infrastructure. In the long term, many sheep farms (lamb, dual purpose and wool) have out-performed beef, though the best beef enterprises do hold their own with sheep enterprises. Traditionally, beef enterprises have had more capital tied up in stock though at present many sheep enterprises have similar capital invested in the enterprise. For individual enterprises, better returns are often achieved by improving the enterprise rather than chasing high commodity prices in a different enterprise.

In terms of the difference between breeding and trading enterprises, there are numerous issues to consider. Apart from profitability, trading enterprises offer a better fit with the pasture growth curve if stock are purchased in autumn and sold in late spring, with few carry-over stock in summer. However, the volatility of trading enterprises is high and profits are dependant not only on growth rates, but also on the price per kg liveweight on both purchase and sale price. This is often beyond the manager's control so relying on trading enterprises alone, whilst potentially profitable, comes with substantial volatility (risk).

Another important consideration is: are the enterprises complementary enterprises? For example, swapping sheep and cattle every six months offers substantial benefits in worm control. This advantage would be difficult to gain if areas were run as sheep only or cattle

only. Swapping sheep and cattle every six months is a potential 'free kick', with gains in productivity of up to 10% in both enterprises possible. However, one common challenge is limited pasture availability when cattle follow sheep. Clearly, running cattle in conjunction with sheep for worm control alone is not sensible and should be driven by the profitability of the enterprise.

The optimal enterprise mix will ultimately depend on relative profitabilities. Figures are often quoted of optimal cropping proportions of between 30–40%, but the best mix is driven more by management, land class, commodity prices and infrastructure. For many producers, the proportion of cropping has increased in recent years. On paper, the figures may look appealing but often they do not consider the additional risk, especially where cropping is expanding into marginal areas, such as where water-logging is an issue. The comparative returns (\$/ha) from cropping are often over-estimated when compared with livestock as cropping is usually undertaken on the best land class. Livestock has difficulty competing with cropping, which consistently achieves high water use efficiency.

There are substantial benefits of mixed crop-livestock enterprises from an animal perspective. We observe that higher stocking rates are achieved in livestock enterprises that include cropping. The main benefit to livestock is enabling higher stocking rates (often an additional 10% or more in winter) as grazing pressure on pasture areas is reduced in the most feed-limiting times (summer/autumn when stock have access to stubbles, and in early winter when there is potential to graze cereals and/or canola). This ensures pastures respond quickly to autumn rains and have increased availability in winter.

The feed value of the stubble and the amount of stock required for stubbles is highly variable. In some years stubble grazing may contribute a significant proportion to crop income. Livestock enterprises should be flexible enough to adjust to feed availability. They may require additional trading stock in years of abundant

stubble or may simply help reduce liveweight loss and reduce supplementary feeding on poor quality stubbles, thus contributing to higher production and/or lower costs in the livestock enterprise.

Set the management calendar to fit the pasture growth curve

One of the most important decisions to make is setting the time of calving and lambing. Ideally, this will be set to enable a good fit between pasture growth and feed demand. In wool enterprises, later lambing is generally more profitable as it enables higher stocking rates and more wool to be produced – with less supplementary feeding. We normally conservatively expect 0.5 DSE extra per lambing ewe can be run when changing from autumn to late winter lambing. With prime lamb flocks, the optimal lambing time is a bit earlier – about 4–5 months before the end of the growing season (unless there are substantial good quality stubbles or summer finishing pastures). A balance must be met between minimising winter grazing pressure (later lambing better), reproductive performance (later a bit better), minimising supplementation of ewes (later better) and the ability to finish lambs (earlier lambing easier, but not in autumn).

Autumn calving better suits weaner production if the objective is to maximise calf weight. If the objective is to maximise beef production and profit, late winter and spring calving systems may be a better option. Spring calving enables higher stocking rates to be run with more beef production per hectare with less supplementary feeding. Spring calving herds tend to be less vulnerable to drought as it is still possible to join cows in late spring in most years, compared with early winter joining in autumn calving herds. The Farm Monitor Project in Victoria demonstrates this point when comparing the performance of autumn and spring calving herds in south west, north east Victoria and Gippsland. Table 7 summarises the performance of spring and autumn calving herds in north East Victoria. On all attributes spring calving performance is superior.

Table 7. Performance of spring and autumn calving beef herds in north east Victoria (2014?).

	Autumn calving herds	Spring calving herds
Stocking rate DSE/ha	10.4	12.6
Beef production kg/ ha/100mm	23	30
Feed cost \$/DSE	\$3.06	\$1.33
Gross margin \$/ ha/100mm	\$23	\$28
Breakeven price \$/kg liveweight	\$1.72	\$1.12
Profit \$/ha	-\$45	\$63

Herd structure, reproductive management and timing of management

To successfully run high stocking rates, timing of management is critical. Length of joining should ideally extend for five weeks with sheep and six to seven weeks for cattle. This enables easier weaner management, better nutritional management of ewes and lambs, and worm control in sheep. There is never any reason not to wean Merino lambs after 13 weeks of age. Prime lambs can be carried on for longer in good seasons. However, in poor seasons, or where lambs can be weaned onto high quality pasture, early weaning will not only benefit lambs but will also enable recovery of ewes whilst pasture quality is still reasonable in early summer. This will ensure high conception rate the following year.

For cattle, a tight joining enables a good recovery time after calving for cows to start cycling before next mating. This results in a higher average age and weight of progeny, and a more valuable breeding herd. A tight calving period is also more labour efficient. In spring calving herds, calves should be weaned when cow condition score falls to 2.5. This may range from January in drought years to March in good seasons. Feed resources are best allocated to young, growing weaners and cows can be given the poorer quality feed. There is also a small saving in feed efficiency due to less wastage during lactation.

Another important management strategy to adopt in efficient herds is the herd structure.

Ideally cows should be sold by eight years of age. To achieve this, most heifers should be mated at 15 months of age and a high proportion retained. This will result in selling more high value old cows and fewer low value heifers. It may take several years to achieve this objective if the herd has an extended calving with significant dystocia problems.

Animal health

Animal health costs on livestock farms are typically about 5–8% of total costs. The most important decisions relating to animal health are about management to increase production rather than reducing costs.

Animal health management is critical to optimise utilisation of available pasture. Poor health, especially that due to inadequate worm control, will result in poor use of pastures. The impact on performance will be severe if stocking rates increase and worm control is sub-optimal. Intensification often induces animal health problems. For example, selenium deficiency can be more severe with improved pasture production. This is due to a combination of dilution of selenium with the extra pasture production and potential interactions with fertiliser (sulphur) limiting the availability of selenium.

To highlight the opportunities provided by good animal health control, a recent study, undertaken by the Mackinnon Project, demonstrated that the difference in growth rates of weaned calves with good and poor worm control was more than 30 kg/head over a six month period. In addition, weaned calves grazing highly improved pastures on several properties that were diagnosed deficient in selenium had a significant response to selenium supplementation (range 3.2–11.1 kg liveweight gain over 6 months). The benefit:cost ratio of supplementation ranged between 3:1 to 9:1.

Other management issues

There are numerous other management issues that need to be addressed to ensure a profitable enterprise is run and enable the efficient use of pasture resources, especially as stocking rates increase. Issues including nutritional

management, genetic improvement and marketing are important to consider.

Genetic improvement

Genetic improvement is another important element of management that drives the profit of livestock enterprises. The first step in genetic improvement is to develop a breeding objective that set targets and strategies that optimise improvement of the most economically important traits. Use genetic tools such as ASBVs and EBVs to select sires and replacement stock as appropriate. For wool in particular, the genetic merit of the sheep is critical. The existing bloodline should be benchmarked to identify how it is performing against industry, whether by using wether trials (for example NSW DPI bloodline performance, Peter Westblade Memorial Merino Challenge) or progeny trialling different bloodlines to identify differences in profitability.

To highlight the importance of genetic differences in driving farm income, a wool enterprise identified from its annual benchmarking that the performance of the current bloodline was well below average. The managers were prompted to set up a progeny trial comparing three bloodlines that were performing well in local wether trials, and were consistent with the breeding objectives for the flock. On current wool values, once the new bloodline was in the flock, the difference in fleece value alone amount to an extra \$98,000 in wool income from the 14,000 sheep. A similar range in genetic differences and opportunities exists with prime lamb enterprises (growth, fertility, carcase and wool traits) and beef cattle (growth, fertility and carcase traits).

Increasing stocking rate: prioritising investment in stock, grazing management, fertiliser and new pasture

The first key step to run a profitable livestock enterprise is to design the management calendar to enable efficient use of pasture resources. Once this is achieved, the next step is to utilise available pasture.

Investment in stock will give the best return. The most profitable enterprises utilise about

50–60% of available pasture. The average pasture utilisation is estimated to be about 35% in southern Australia.

Benchmarks for stocking rate have been determined for south eastern Australia. Taking account of growing season, paddock size and soil phosphorous levels, as outlined by Saul *et al.* (2002), provides a comprehensive indication of potential stocking rate. Although few producers achieve these guideline stocking rates across the whole of their properties, many do for individual paddocks.

At the same time as investing in stock to increase pasture utilisation, grazing management becomes more important. At low stocking rates the method of grazing is relatively unimportant. At higher stocking rates grazing management becomes critical, especially at the most feed-limiting time. The grazing management system must be a balance of optimising pasture growth and managing livestock, infrastructure and labour resources.

Once available pasture is utilised, the next step is to invest in growing more grass. The first step is to rectify major nutrient deficiencies. Soil testing will determine what nutrients are deficient. The major limiting nutrients are phosphorous, potassium and sulphur and limiting micronutrients, such as molybdenum. In addition, lime is often necessary, although the return on investment is usually less than phosphorous due to its higher cost (\$/ha at typical application rates) and lower marginal increase in stocking rate. Tactical use of nitrogen and gibberellic acid in periods of feed shortage in winter is often a cheaper option than supplements, when feed is green.

The cost of fertiliser is substantial and one of the largest single costs on a farm. Increasing soil fertility will not only increase pasture growth, but also extend the growing season and increase pasture quality and animal performance. The marginal return on investment from fertiliser application is dependent on the cost of fertiliser, profitability of the enterprise and the increase in stocking rate achieved.

Often producers perceive increasing stocking rate in conjunction with fertiliser application is a risky strategy. However, the opposite is often true. If stocking rate is increased when soil fertility is low, there is risk the system may crash unless it is monitored closely, especially in poor seasons. If soil fertility is good, it is possible to run higher stocking rates. The system is more likely to cope with poor seasonal conditions due to higher pasture growth over a longer period and be highly profitable in good seasons. With low soil fertility, there is little scope to increase stocking rate before the system crashes.

The final step in increasing pasture production on farm is to renovate pastures and introduce more productive pasture cultivars. Ideally new cultivars should be more productive, drought tolerant, provide better quality feed and be safe for livestock. The more recent winter active phalaris cultivars (CV Landmaster, Holdfast GT or Advanced AT) have been very impressive at providing more winter feed. In cooler, high rainfall regions, perennial ryegrass cultivars with safe endophyte selections that have wide pest tolerance (AR 37, endo 5) have also potential to improve productivity. New cocksfoot and fescues and lucerne cultivars also offer alternatives. The cost of renovation ranges from less than \$200/ha to over \$400/ha. As the payback period will often be over five years, it is critical to first identify paddocks that will generate the largest increase in stocking rate at lowest cost. Generally stocking rates must increase by at least 3–5 DSE/ha to justify the cost of renovation and risk involved. The return on investment will be greatest when the enterprise run is profitable.

Drought management

When increasing stocking rates it is critical to plan for drought. Many farmers are familiar with drought over the last 15 years and as a result many are reluctant to increase stock numbers. However, in reality many producers do not have viable businesses if it is operating at low stocking rates. Planning is critical in order to minimise the risk of drought. Whilst droughts will almost always cost producers, the impact (to some extent) can be controlled

and recovery hastened by careful planning. This usually includes a combination of building up farm feed reserves and funds for feeding in drought, and strategic sales of livestock. There are many options but poor or no planning can be disastrous, both emotionally and financially.

Conclusion

The range in profitability of farm enterprises is enormous. Whilst commodity prices can't be controlled, many aspects that determine profitability are under the control of managers. There are many opportunities for producers to invest on farm to increase profitability. The first step is to plan and implement the management system and enterprise mix that not only maximises profit, but also controls

risk. The most profitable farms usually generate more income per hectare and this drives higher profits. They achieve this by producing more wool, lamb and beef per hectare, but at a lower cost of production. Adopting simple proven management systems, growing more grass and utilising it through higher stocking rates and profitable enterprises is essential to achieve high farm profitability.

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