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Situation analysis of productivity and profitability in southern beef production systems 2017

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Abstract

The southern beef situation analysis provides updated reporting of productivity and profitability in southern beef production systems.

The southern beef situation analysis identifies the key influences on profit and areas of focus for beef producers to increase the resilience and productivity of their businesses. This analysis generates a greater understanding of the economic performance and issues impacting producers at the enterprise level.

This report highlights differences in performance parameters between beef producers generating high profits (top) versus those generating average profits (average). This information can be used to identify key issues and potential opportunities to improve one or more aspects of performance.

Due largely to higher prices, the last two years has generated the highest profits seen over the last 20 years. Average beef profits over the last two years have more than doubled those of the preceeding 18 years.

Executive summary

- Profits of beef enterprises in 2016 and 2017 are as high as they have ever been due primarily to price rises.
- Average beef profits for the last two years are $25 per DSE and $43 per hectare per 100 millimetres of rainfall. These profit levels are more than double profit levels achieved between 1998 and 2014.
- The last five years has seen particularly favourable seasonal conditions for beef production. Dry periods have been experienced but their impact on profit has been negligible.
- Over a five year time frame beef is the highest profit producing livestock enterprise generating $30 per hectare per 100 millimetres of rainfall but lagging behind cropping over this period.
- In 2017 beef profits per hectare are second only to dual purpose sheep enterprises which are buoyed by their complementarity with wool.
- The highest profit beef producers generate 60 percent more profit per DSE and 80 percent more profit per hectare than the remainder, primarily from higher production per head and per hectare but also due to a lower cost structure per DSE.
- The highest profit beef producers with the lowest cost of production had a greater focus on per hectare production.
- There is more than one pathway to high profits in beef production. Some high profit beef producers derive more profit through more income per DSE while others achieve it through a lower cost structure and a focus on per hectare production.
- Regardless of which high profit path is chosen the common ground is that high levels of feed utilisation are achieved resulting in higher stocking rates per hectare. This suggests that feed utilisation is still the number one productivity issue facing southern Australian beef producers. Technologies that can assess pasture biomass efficiently and accurately are still required.
- There is evidence of beef producers investing in areas that increase beef production but there is no evidence that the additional production has been achieved. It may be yet to come.
- It may make financial sense to chase production through additional costs when prices are high. Productivity investments that were borderline in the past may now generate better returns. Skills and understanding of how to conduct an investment analysis is therefore critical.
- Drought resilience in beef businesses achieving high levels of profit is dependent on acting quickly and decisively. It is not achieved by running sub optimal stocking rates in all years as a precautionary measure. Early action can come at a cost but this is generally small in relation to the value of the losses being offset.
- Cost of production has increased but margins have not been affected due to high prices. Production per hectare has increased but not at the same rate as has cost of production.
- Labour efficiency continues to be a good news story for beef. Labour efficiency has grown at rates of 2.2% per annum with close to 15,000 DSE per labour unit being achieved on average. Understanding where to make investments in labour saving devices and technologies is important.

- Improvements in productivity require assessment of return on investment. Matching feed supply with demand by implementing sensible systems and improving pasture utilisation are usually the lowest cost gains thus should be the first steps. Growing more pasture should be a secondary consideration.

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1 Background and definitions

1.1 Introduction

This paper analyses and reports the historical and current profit and profitability of beef enterprises in southern Australia. It also reports the variability in beef enterprise profits and considers why this variation occurs. The key differences between beef producers who consistently generate high levels of profit and the remaining beef producers have been highlighted to identify opportunities for improvement in profitability more broadly across the industry.

Data analysed for the southern beef situation analysis is extracted from farms with beef breeding enterprises located across NSW, Queensland, Victoria, Tasmania and South Australia. In total 1,998 data points from 300 localities contribute to the beef breeding enterprise data set. Beef breeding enterprises analysed consist of breeding cattle, primarily self-replacing herds. The locations of farms contributing data to the three rainfall zones referred to in the analysis (<500 millimetre zone, 500-650 millimetre zone and >650 millimetre zone) are shown in Figure 1 to Figure 3. Benchmarking participants were allocated to rainfall zones based on their location relative to the nearest Bureau of meteorology rainfall recording station.

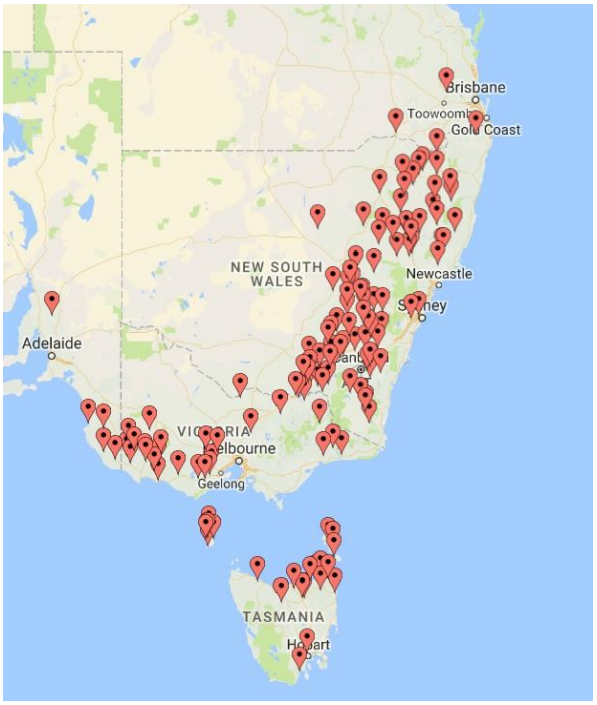


Figure 1: Locations of beef properties benchmarked in the >650 millimetre rainfall zone (n= 1163)

Map source: Google maps/BatchGeo

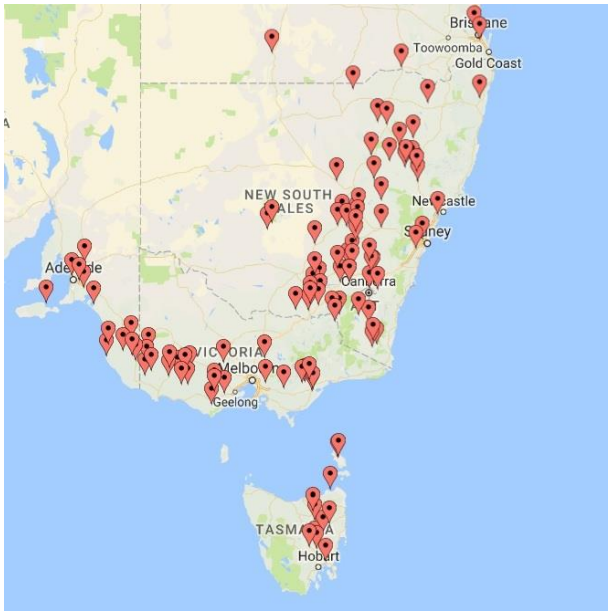


Figure 2: Locations of beef properties benchmarked in the 500-650 millimetre rainfall zone (n = 625) Map source: Google maps/BatchGeo

Figure 3: Locations of beef properties benchmarked in the <500 millimetre rainfall zone (n = 210) Map source: Google maps/BatchGeo

Period benchmarked

Benchmarking participants have the option to benchmark a calendar (January to December), production (April to March) or financial year (July to June). This provides all participants with a common spring production period. The year shown in the graphs following relates to year end and corresponds with the spring period of the preceding year. For example, the 2017 year data shows benchmarking data for:

- the calendar year period from January 2016 to December 2016,

- the production year period from April 2016 to March 2017 and

- the financial year period from July 2016 to June 2017.

Each of these years captures the spring of 2016.

The 2017 benchmarking year data includes data collected to the time of writing of this report 17 October 2017. It includes 145 data points for the year but the data collection for the year is not complete.

The benchmarked data presented is not drawn from a random sample of farms. Owners of farm businesses choose to benchmark their farm performance thus they are not a random sample. Those farm businesses contributing to the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) survey are a random sample.

Comparing average whole farm profitability (operating return on assets managed) between the Holmes Sackett farm benchmarking data set and the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) data set assists in demonstrating the extent of the disparity in financial performance between the Holmes Sackett data set and the industry more broadly.

Five year average operating returns of grazing farms between 2012 to 2016 were 1.8% and 3.7% for the ABARES and Holmes Sackett data sets respectively. This demonstrates that the average return on assets of the Holmes Sackett data referenced in this report is not representative of the average for the southern mixed farming industry as a whole.

The enterprises compared in this report, unless otherwise specifically stated, fall under the following definitions.

Beef enterprises (beef herds)

These enterprises are predominantly self-replacing beef breeding herds. More detail regarding average herds are shown in Table 2.

Prime lamb enterprises (flocks)

These enterprises are those for which both the maternal and terminal breeds are known to be specialist prime lamb breeds with little wool value comparative to their sheep meat value. These flocks will include flocks where the more traditional first cross ewe (e.g. Border Leicester x Merino) are joined to terminal sires (predominantly Dorset and Suffolk), and also self-replacing pure bred or composite prime lamb flocks (e.g. Coopworth flocks).

Dual purpose sheep enterprises (flocks)

Dual purpose sheep enterprises generate income that is relatively evenly split between wool and meat. The majority of the income from the meat component of the income is derived from lamb. The majority of these flocks consist of surplus merino ewes from specialist wool flocks joined to either a maternal or terminal sire. There are only a few dual purpose breeds represented in the data.

Wool enterprises (flocks)

Wool enterprises consist primarily of self-replacing merino sheep enterprises. Some of these flocks retain wethers (castrated male sheep) in the flock for periods of up to three years of age.

Dryland crop enterprises

Dryland crop enterprises are dominated by wheat and canola. Dryland crop profits have been calculated by adding 70% of the average wheat profit to 30% of the average canola profit for each year to reflect the typical rotation emphasis between the two major crops.

Net Profit (Earnings before interest and tax EBIT)

Net profit or EBIT is defined as gross profit (sales plus inventory change less purchases) less all operating expenses excluding capital equipment purchases, capital land developments, tax, financing costs on liabilities, land lease costs and personal expenditure not funded from salary. Depreciation on capital items is included as an expense. Owner drawings, as an imputed salary value, are included in the expenses.

An owner wage is included in the expenses for businesses with owner employees. This owner wage is derived from the average of the Holmes Sackett salary benchmarking. For the 2017 year of data this equates to $115,000 for the first full time owner labour unit and $70,000 for every subsequent full-time labour unit. This represents a significant increase in cost relative to previous years where $70,000 was allocated to the first full time owner labour unit and $50,000 for every subsequent full time labour unit. The change reflects the salary package of a farm manager from survey data collected by Holmes Sackett. The average farm manager's salary package includes the pre-tax value of the wage, superannuation, residence, motor vehicle use and incidental benefits.

Profitability

Profit differs to profitability. Profit is an absolute dollar figure while profitability is a ratio. They key measure of profitability at a whole farm level is operating return on assets managed. This is calculated by dividing whole farm profit by the total value of farm assets under management. Profitability, when calculated at the whole farm level, is a measure of the financial efficiency of the use of all the value of farm resources that have been deployed.

Most of the data is reported in nominal terms. This means it is reported as the value at the time of data collection. This means it has not been adjusted for inflation since it was collated to reflect the value of that money in 2017 terms.

Dry sheep equivalent (DSE)

For the purpose of this report a DSE unit refers to the energy requirements of a young adult, 50 kilogram merino wether (castrated male sheep) at maintenance. Energy requirements of livestock vary according to:

- liveweight
- age
- sex and reproductive stage
- fecundity
- productive rate
- stage of the production cycle
- weather conditions

Application of the DSE unit of measurement to different livestock production systems allows for the application of a standard unit for comparisons within and between livestock enterprises and between businesses.

Broad DSE ratings for different livestock classes and reproductive stages for beef enterprises are shown in Table 1. Average annual DSE ratings for breeding livestock are calculated by multiplying the DSE rating for the stage of reproduction by duration of the stage of reproduction as a proportion of the year. As a simple rule of thumb a cow with a follower through to sale weights at 16 months of age has a rating of approximately 20 DSE per head. This is calculated by summing the average annual DSE rating of the cow (14 DSE/head) and the average annual DSE rating of progeny from weaning to sale (6 DSE/head).

Table 1 Beef DSE ratings per head Source: Holmes Sackett AgInsights

Beef DSE ratings		
	Dry sheep equivalents	
Weaned calves	**200kg**	**250kg**
Weaned calves gaining 0.25kg/day	4	5
Weaned calves gaining 0.75kg/day	7	8
Yearlings	**300kg**	**350kg**
Yearlings gaining 0.25kg/day	6	7
Yearlings gaining 0.75kg/day	9	10
Mature cattle	**400kg**	**500kg**
Dry cows, steers (maintenance)	6	7
Dry cows, steers gaining 0.25kg/day	7	9
Bullocks gaining 0.75kg/day	11	13
Pregnant cows (last 3 months)	8	9
Cows with calves (0-3 months)	13	15
Cows with calves (4-6 months)	16	17

Beef cow (500 kilogram per head) DSE ratings			
Status	**DSE/hd**	**Time (mths)**	**Total DSE**
Pregnant, last 4 months	9	4	3.0
Lactating 0-3 months	15	3	3.8
Lactating 4-8 months	17	5	7.1
Total/average		**12**	**13.8**

2 Long term and current situation 2017

2.1 Relative profits over the long term

Beef enterprise profits per hectare are at record high levels. In 2016 beef profits generated the highest per hectare profits of all livestock enterprises and in 2017 they have only been surpassed by dual purpose sheep enterprise profits. In the last two years the average beef herd profit has been $40 per hectare per 100 millimetres of rainfall. This is over $10 per hectare per 100 millimetres higher than prime lamb and wool enterprise profits.

In a big turnaround since the 2013 situation analysis beef enterprises have moved to a position of superior average profits per hectare when compared to all sheep enterprises. Figure 4 shows that over the period of 20 years from 1998-2017 the fortunes of these industries have varied greatly, but in the last few years it has been beef and cropping enterprises that have been the most profitable.

Prime lamb enterprise profits have averaged $23 per hectare per 100 millimetres for the last two years. Dual purpose flocks have average $38 per hectare per 100 millimetres and wool flocks have average $27 per hectare per 100 millimetres for the last two years. Beef and dryland cropping enterprises have generated profits of $40 per hectare per 100 millimetres of rainfall over the last two years.

Cropping retains the title as the most volatile enterprise over the long term but the last five years have not seen the level of volatility seen during former five year periods in the data set. Not only have they seen very little volatility, they have generated average profits of greater than $30 per hectare per 100 millimetres rainfall in every year over the last five.

For the first seventeen of the 20 years in the period analysed beef profits remained below $22 profit per hectare per 100 millimetres of rainfall. The price increases of the last three years saw profits increase to a point where they are now over $40 per hectare per 100 millimetres of rainfall. Sheep enterprises have followed a profit path which appears to bear little resemblance to that of beef. Wool and dual purpose sheep enterprises saw a profit spike around 2011 and 2012 and again in 2017. Lamb has followed a generally consistent profit pathway with profits sitting mostly between $23 and $33 per hectare per 100 millimetres.

Figure 4 shows the historical beef enterprise profits per hectare compared with other enterprises. Currently beef enterprise profits per hectare supersede wool, lamb and crop enterprise profits. Recent years have provided strong nominal profits for beef driven primarily by solid prices. The profits per hectare over the last three years in beef enterprises is double that of the preceding three-year period. This has resulted in considerable boost to the historical average profits.

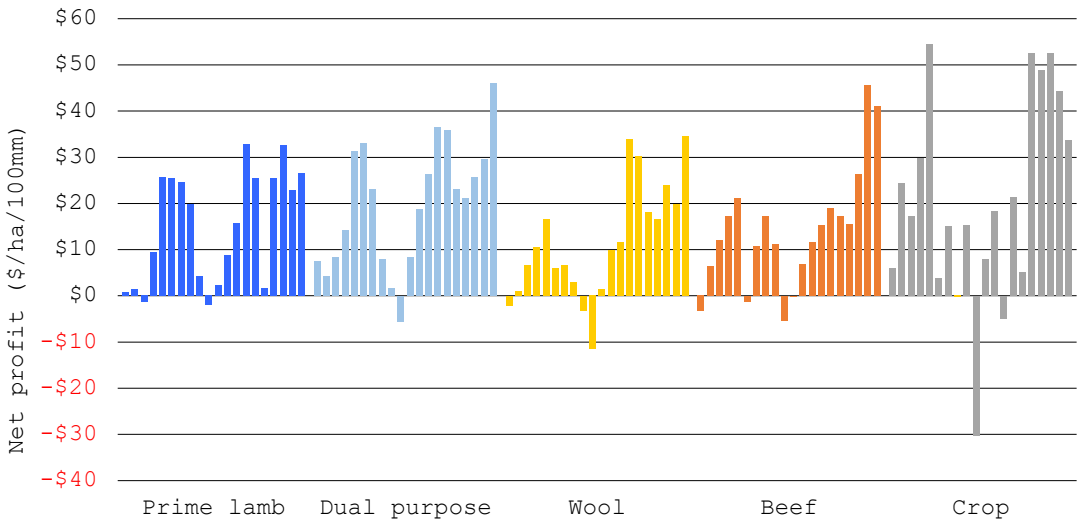


Figure 4: Nominal net profit per hectare per 100 millimetres of annual rainfall for wool flocks, beef herds, dual purpose and prime lamb flocks over 20 years from 1998 to 2017. (Individual bars represent individual years between 1998 and 2017)

Source: Holmes Sackett Pty Ltd Benchmarking Database 1998 – 2017

Figure 5 shows the comparative net profit per hectare per 100 millimetres of year analysed rainfall by different enterprises over different time frames. The recent exceptional profits generated in beef enterprises have changed the weightings of beefs rank relative to other enterprises over time.

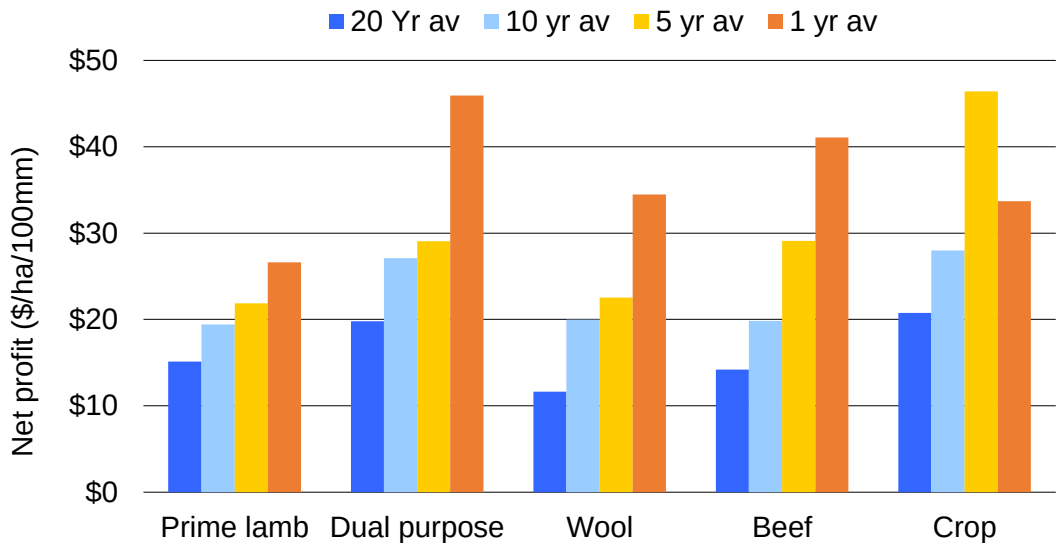


Figure 5 Comparative enterprise net profit per hectare per 100 millimetres of year analysed rainfall over different time frames. Source: Holmes Sackett Pty Ltd Benchmarking Database 1998 to 2017

A comparison of the average profitability between beef enterprises, other livestock and crops in south east Australia over the twenty year period from 1998-2017 is shown in Figure 6. Net profit has been compared per hectare per 100 millimetres of rainfall to allow for comparison between cropping and livestock enterprises across different rainfall zones.

Due to its higher returns relative to broadacre livestock enterprises, dryland cropping in southern Australia typically occurs on the most productive land classes. To this extent, profits of cropping enterprises, relative to livestock enterprises in mixed enterprise businesses are biased in favour of cropping. The extent of this bias over the whole data set has not been quantified.

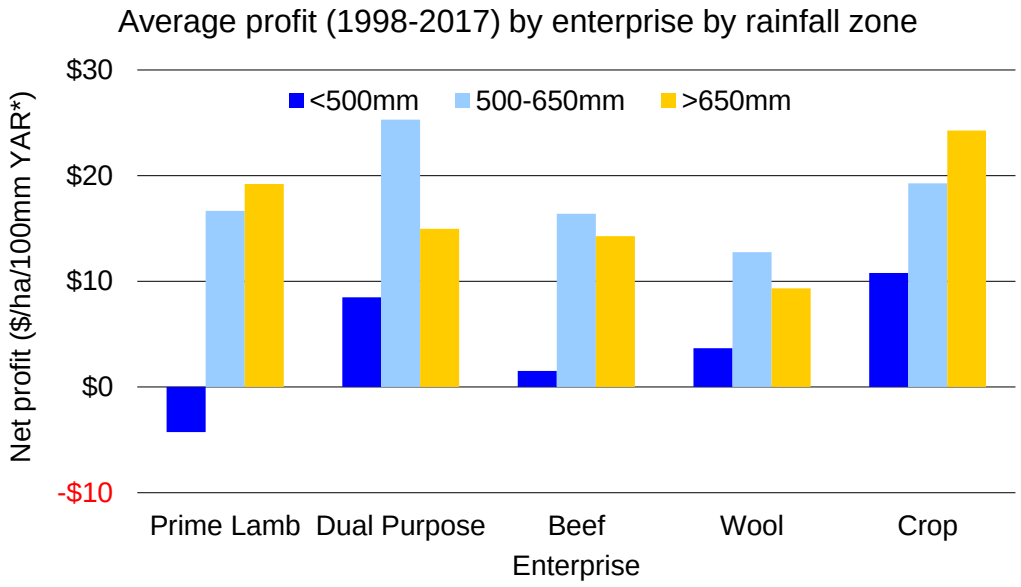


Figure 6: Average net profit per hectare per 100mm of annual rainfall (nominal) for wool flocks, beef herds, dual purpose flocks, prime lamb flocks and dryland winter crops from 1998 to 2017.

Source: Holmes Sackett Pty Ltd Benchmarking Database 1998 to 2017
*YAR= Year analysed rainfall

Over the long term (20 years) beef enterprises are ranked fourth of five enterprises. This is the same long term ranking for beef as was reported in the 2008 and 2013 situation analyses. Figure 7 shows:

The difference in relative profit per hectare per 100 millimetres of year analysed rainfall between other enterprises and beef expressed as a percentage.

The extent to which the relativity between beef profits and alternative enterprise profits has changed between the 2013 and the 2017 situation analysis.

Figure 7 shows that in 2013 long term prime lamb profits were forty percent higher (in real terms) than beef profits while dual purpose sheep profits were eighty percent higher than beef profits. In 2017 long term prime lamb profits are now less than ten percent higher than beef with long term dual purpose sheep enterprise profits exceeding those of beef by forty percent. At the same time wool and crop profit relativity to beef has changed little. One of the key messages from the 2013 situation analysis for lamb producers was that increasing prices hadn't resulted in increased profit margins due to a lack of cost control. It would appear that this lack of cost control, coupled with strong beef prices have seen the reign of lamb over beef over the longer term narrow considerably.

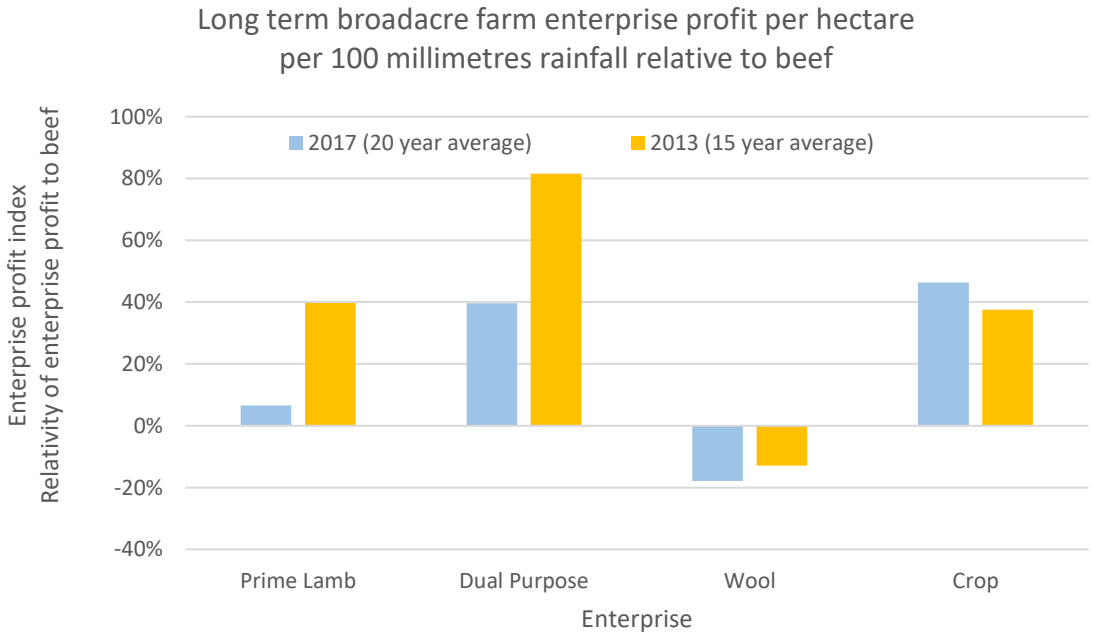


Figure 7 Over the long term, the disparity between beef enterprise profits and alternative enterprise profits is narrowing. Source: Holmes Sackett Pty Ltd Benchmarking Database

Given there has been little change in the disparity between wool and beef profits per hectare it would suggest that wool profits have increased at a similar rate as beef over the last five years but still with the same lag.

2.2 Relative profits over the short term

Figure 8 shows the average profits of each enterprise over the past five years and compares this with the profits as reported in the 2013 situation analysis. Beef enterprise profits per hectare, which were the lowest ranking livestock enterprise in the last report are now second only to dual purpose sheep enterprises. The change in beef profit between reporting periods represents a phenomenal 160 percent change.

At the same time profits per hectare of cropping enterprises have changed ranking from the lowest ranking enterprise from 2008 to 2012 to the highest-ranking enterprise. This represents a change of over 300 percent between periods.

Wool, prime lamb and dual purpose enterprise profits per hectare increased by thirty, twenty five and sixteen percent respectively between five year reporting periods. The order of ranking over the latest five-year period based on profits per hectare per 100 millimetres of rainfall has been dryland cropping, dual purpose sheep followed by beef, wool and prime lamb.

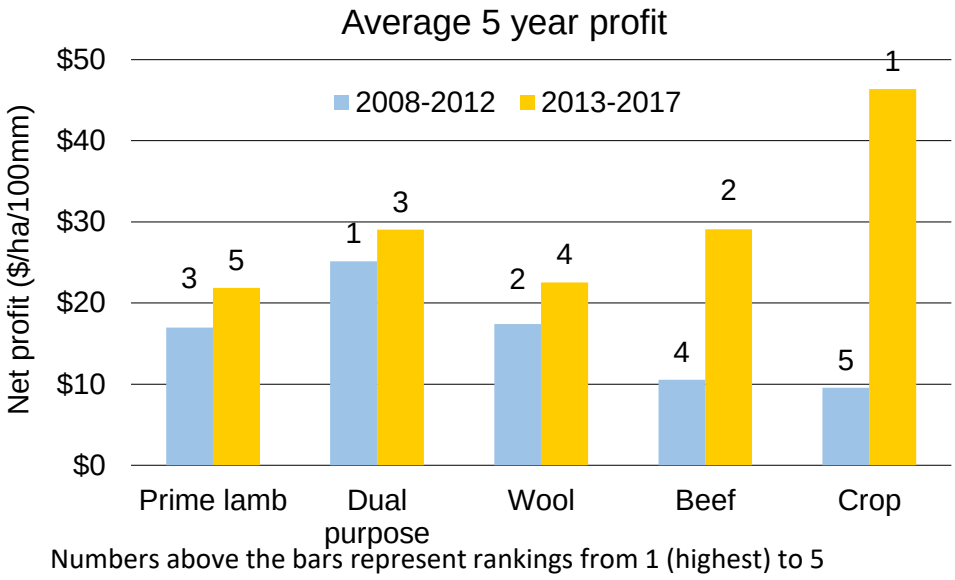


Figure 8 The magnitude of the change in per hectare profits between five year periods has been exceptional in dryland cropping and beef.

The change in ranking of enterprise profitability between five-year periods is not unusual. In the 2013 situation analysis wool enterprises moved up the order of ranking and in 2017 it is cropping and beef with the most monumental change in profit between reporting periods and rankings. Lamb is now ranked at the bottom of the order. The decline in lamb profit rankings is due not only to the exceptional performance of the remaining enterprises but also to a lack of discipline in expenditure. The messages for lamb producers surrounding how to improve profitability are delivered in greater detail in the 2017 lamb situation analysis.

The change in relative profit rankings between enterprises over the long term (Figure 4) suggests that strategic decisions regarding enterprise mix should not be made solely on relative profitability

between enterprises. Such decisions are best made based on suitability of physical and human resources with a focus on managing each enterprise as well as is possible. The extent of the variation in profits within enterprises (due to variation in management performance and variations in commodity cycles) are usually greater than the extent of the variation in profits between enterprises.

2.3 Long term profits by geographical zone

The profits in three different geographical zones have been analysed. These geographical zones have been defined as the low rainfall zone (<500mm long term average rainfall), medium rainfall (500-650mm long term average rainfall) and high rainfall zone (>650mm long term average rainfall).

Figure ***11*** shows the comparisons of each enterprise by geographical zone over a twenty year period from 1998 to 2017. These zones are similar to the Pastoral zone, Wheat-sheep zone and High rainfall zones used in farm surveys by ABARES (Figure 10).

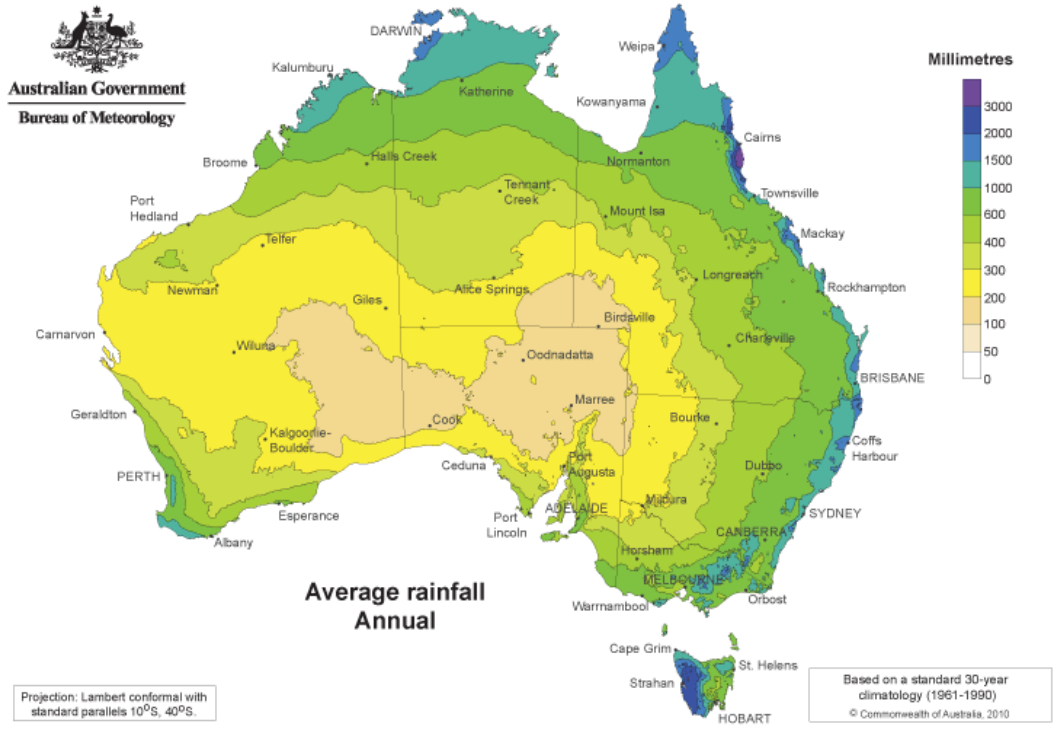


Figure 9: Rainfall zones of Australia

Source: Australian Bureau of Meteorology

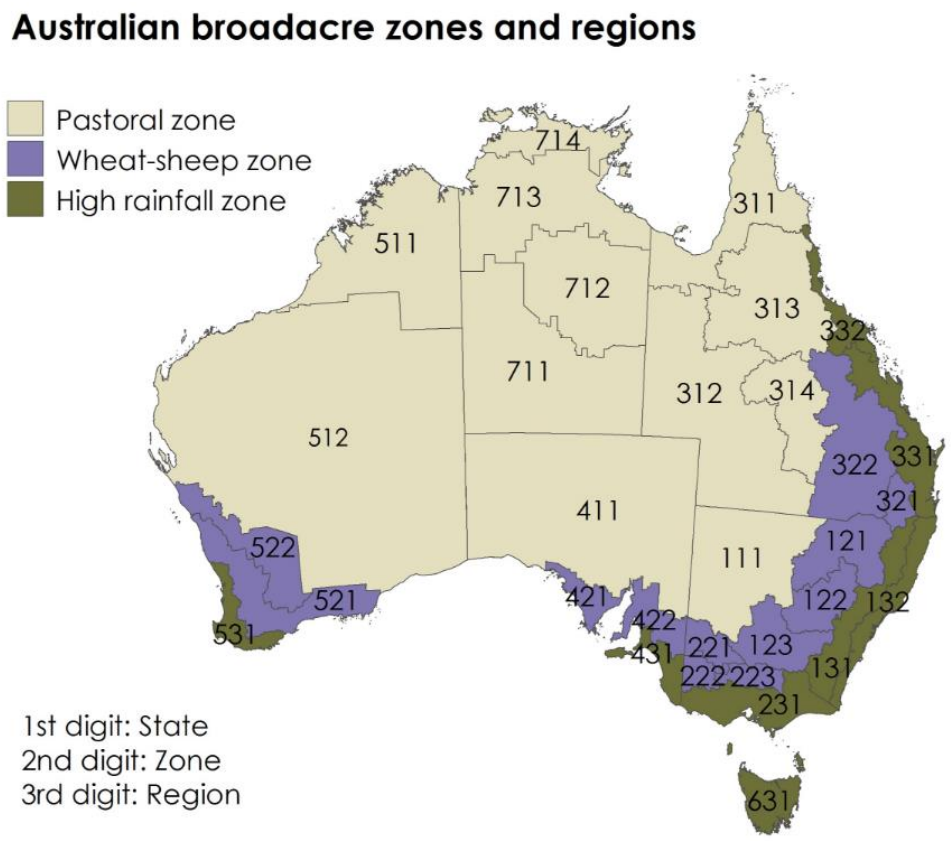


Figure 10: ABARES Australian broadacres zones and regions

2.3.1 Low rainfall zone

In the low rainfall-zone the best performing enterprise has been dryland cropping followed by, dual purpose sheep, wool, beef then lamb. The low rainfall zone accounts for the lowest proportion of the total number of data sets with no enterprise representing more than 20 percent of the total number of data sets analysed. Dual purpose sheep enterprises have stood out as the dominant livestock enterprise in this zone. Typically, dual purpose sheep enterprises are run as a supplementary enterprise to wool enterprises.

Typically cull ewes are retained for joining to a terminal or maternal sire thereby providing a useful mix of the best genetics for wool production coupled with some of the best for meat production. Typically, the first cross lambs produced from the rainfall zones with less than 500 millimetres of long term rainfall are sold as store lambs to re-stockers for finishing.

Long term crop profits in the low rainfall zone sit at $10 per hectare per 100 millimetres. After dual purpose sheep, wool enterprises are the next best profit generating enterprise in the low rainfall zone. Beef and lamb lag wool with lamb providing net losses over the long term in the rainfall zone. Wool is better suited to the low rainfall zone relative to beef and lamb enterprises as these enterprises require feed of adequate quantity and quality to add weight to trading livestock.

2.3.2 Medium rainfall zone

In the medium rainfall zone dual purpose sheep profits are the best of the livestock enterprises. Dual purpose sheep enterprise profits have exceeded crop profits which is a similar outcome to the 2013 situation analysis.

There is little differentiating the remaining three enterprises in the medium rainfall zone with crop generating close to $20 per hectare per 100 millimetres profit, wool generating $13 per hectare per 100 millimetres and beef and prime lamb generating profits in between these levels.

2.3.3 High rainfall zone

In the high rainfall zone cropping retains the position as the most profitable enterprise followed by prime lamb, dual purpose, beef and wool as the least profitable enterprise. This is the same trend of rank observed in the 2013 situation analysis.

Cropping is the big competitor for land use in all rainfall zones. Over the long term in the high rainfall zone cropping has again demonstrated why land with capability to grow pasture or crop will be prioritised for crop. The use of crops now in the high rainfall zone for multiple purposes including grain and grazing has only further secured their rank in the high rainfall zone.

Many mixed farm business managers have now built systems based on the supply of mid-winter feed offered by grazing cereals and canola. These managers have built skills which have assisted in maximising feed supply from the crop including better understanding of crop phenology and physiology, weed control, moisture preservation and timeliness of sowing. New cultivars allowing for far earlier sowing and feed supply without any additional frost risk or apparent risk to grain production are further pushing the boundaries of convention in some of the very high rainfall areas.

The solid profit performance of beef and prime lamb in this rainfall zone demonstrates, to some extent, the importance of season length to these enterprises. Efficient systems targeting the finishing of trading livestock necessitate the matching of feed supply with feed demand coupled with high levels of weight gain over short periods of time. This appears to be more probable in the high rainfall zone with prime lamb and beef enterprises.

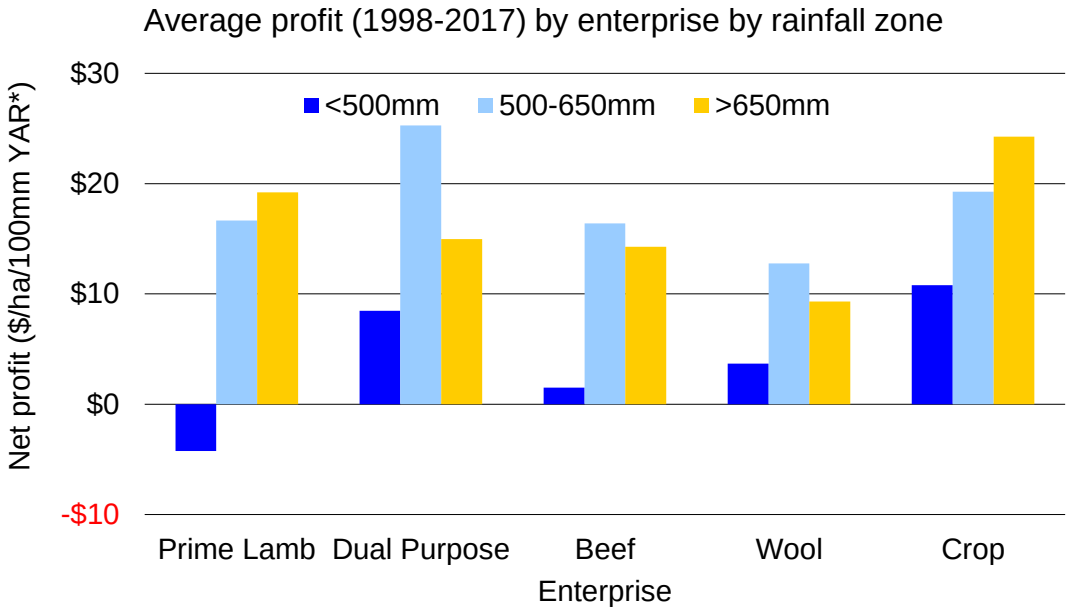


Figure 11 Average net profit per hectare per 100 millimetres of annual rainfall (nominal) for wool flocks, beef herds, dual purpose flocks, prime lamb flocks, and winter dryland crops 1998-2017 by rainfall zone. Source: Holmes Sackett farm benchmarking

**YAR – year analysed rainfall*

2.4 Short term (5 year) profits by geographical zone

2.4.1 Low rainfall zone

In low rainfall areas meat production enterprises have a competitive disadvantage relative to other enterprises due to the shorter pasture growing period. Beef and lamb enterprises typically lag behind dual purpose sheep enterprises, wool and cropping and this trend continues in this data set (Figure 12).

In the low rainfall zone cropping enterprises have generated substantially more profit over the 20 year time frame, more than doubling the profits of all livestock enterprises, with the exception of dual purpose sheep enterprises. Cropping remains a competitor for land resources in this zone. The limitation on how far cropping can push into the low rainfall zone is the volatility and risk that goes with cropping in this zone.

2.4.2 Medium rainfall zone

Cropping has provided the highest levels of profit per hectare in the medium rainfall zone exceeding profits of its nearest competitor by $15 per hectare per 100 millimetres. This is largely a function of five exceptional cropping years with few disasters and very consistent performance. Profits of crops in the medium rainfall zone have increased five-fold since the last situation analysis.

In the medium rainfall zone over the last five years beef is close to the best performing livestock enterprise. This is a big change on the 2013 situation analysis where beef was the worst performing

enterprise in this zone. Beef profits in this rainfall zone have tripled from $10 per hectare per 100 millimetres to over $30 per hectare per 100 millimetres.

There is little splitting livestock enterprises in the medium rainfall zone with little more than $7 per hectare per 100 millimetres between them. The performance of beef is weighted heavily by the last two years in the period while some of the other livestock enterprises, particularly lamb, have more consistency.

2.4.3 High rainfall zone

In the high rainfall zone over the last five years crop returns to the best profit producing enterprise with profits more than double its nearest competitor (beef). This is a big turn-around from the 2013 situation analysis where crop profits generated $15 per hectare per 100 millimetres in the high rainfall zone. The lack of volatility in crop returns over this period has certainly helped provide the magnitude of the difference in profits between livestock and crop returns.

Livestock performance across the medium rainfall zone is higher per hectare per 100 millimetres of rainfall relative to the high rainfall zone. One possible reason for this is that in the high rainfall zone some of the rainfall received is ineffective as the soil profile is already full. In this case additional rainfall does not lead to additional pasture growth and associated livestock production. Where this is the case lower profits are achieved for every millimetre of rainfall received.

Beef is the livestock enterprise generating the highest level of profit in the high rainfall zone but there is only $5 per hectare per 100 millimetres of rainfall (Figure 12splitting the highest and lowest ranking livestock enterprises in that zone.

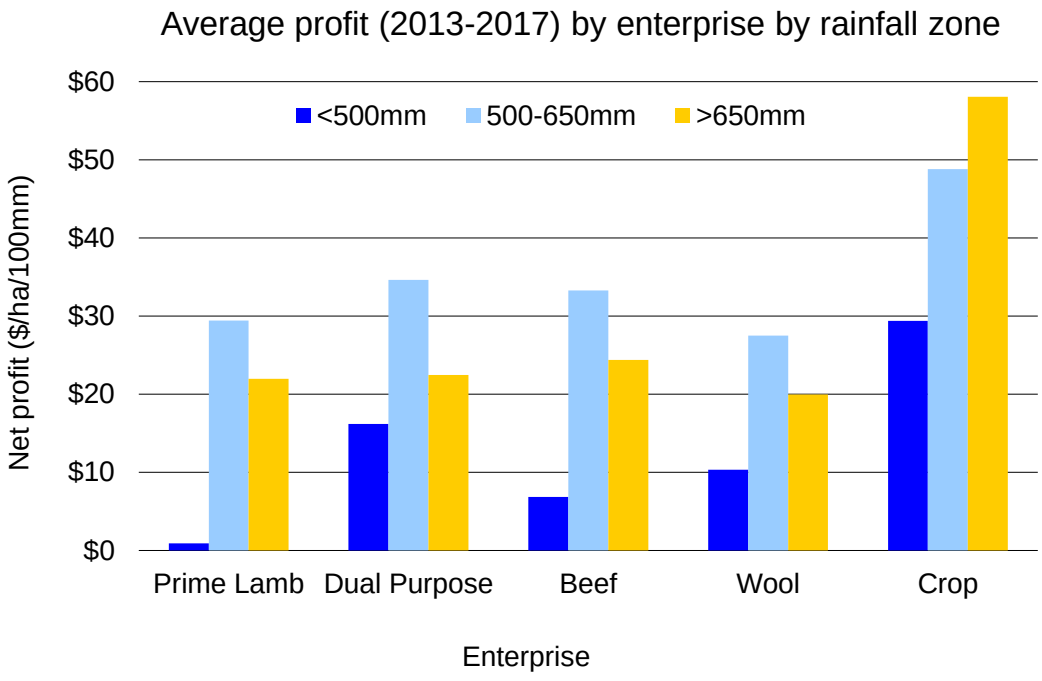


Figure 12 Average net profit per hectare per 100 millimetres of annual rainfall (nominal) for wool flocks, beef herds, dual purpose flocks, prime lamb flocks, and winter dryland crops 20013-2017 by rainfall zone. Source: Holmes Sackett farm benchmarking

3 Beef enterprises

3.1 Beef enterprise characteristics, historical performance and variation

Beef is produced from the arid rangelands to high rainfall zones thus retains the highest geographical coverage of all broadacre agricultural industries. Across the southern production area of Australia, there are a range of operating environments and beef production systems.

Figure 13 shows the average net profit per hectare per 100 millimetres of annual rainfall by year over the 20 year period from 1998 to 2017. The expression of profit per hectares per 100 millimetres of rainfall accounts for variation in rainfall between beef enterprises in the data set. This allows for comparison of rainfall adjusted profits between rainfall zones that would otherwise be difficult.

The historical average over this period (20 years) is represented by the horizontal light blue line and equates to $14 per hectare per 100 millimetres of rainfall. The average has been exceeded in 10 of the last 20 years with seven of these occurring in the period from 2011 to 2017.

The vertical lines running through the bars that represent the average annual profit represent one standard deviation around the mean. Approximately 70% of data points lie within this range. The extent of the standard deviation demonstrates that there is a significant amount of variation in beef enterprise profit in any one year. In the latest two years in the data series the upper end of the standard deviation has increased by over $40 per hectare per 100 millimetres relative to all other years. This demonstrates the extent of the additional profits made by some of the best beef profit generators. The other interesting point from the lower end of the standard deviation lines is that higher prices alone don't necessarily lead to additional profits. There are still a proportion of beef producers, at record prices, generating losses.

Within enterprise variation usually represents opportunity. It is common for producers to consider switching enterprises where superior profits are experienced in alternative enterprises, such as sheep, where resources allow. This approach usually underestimates the level of investment in start-up costs, infrastructure and skill and knowledge accumulation. Thus, there is usually a lag time in delivering similar levels of performance in alternative enterprises. The variation in profits seen annually suggests that, for most beef producers, there is greater opportunity in improving efficiency within the enterprise than moving to another.

Profits of the last three years have nearly doubled the long-term average profits and represent an extremely favourable environment for beef production. An important message for beef producers when profits are good is to provision, for future feed volatility as this does have a significant impact on beef profits. This is demonstrated in Figure 13 where 1998, 2003, 2007 and 2008 demonstrate the impact of the four major widespread droughts of the last 20 years on beef enterprises.

The following facts on the profits shown in Figure 13 demonstrate the extent of how important it is to make sure that the business is performing well when commodity prices are high or when feed availability is high.

- 30 percent of 20-year profits have been made in the last two years
- 40 percent of 20-year profits have been made in the last three years
- 54 percent of 20-year profits have been made in 25 percent of years.

Those beef managers with higher profits over the long term tend not only to act decisively to minimise the losses in the dry times but also to act decisively to utilise additional feed in the good times. Further information on how that might be achieved is included in the last section of this report.

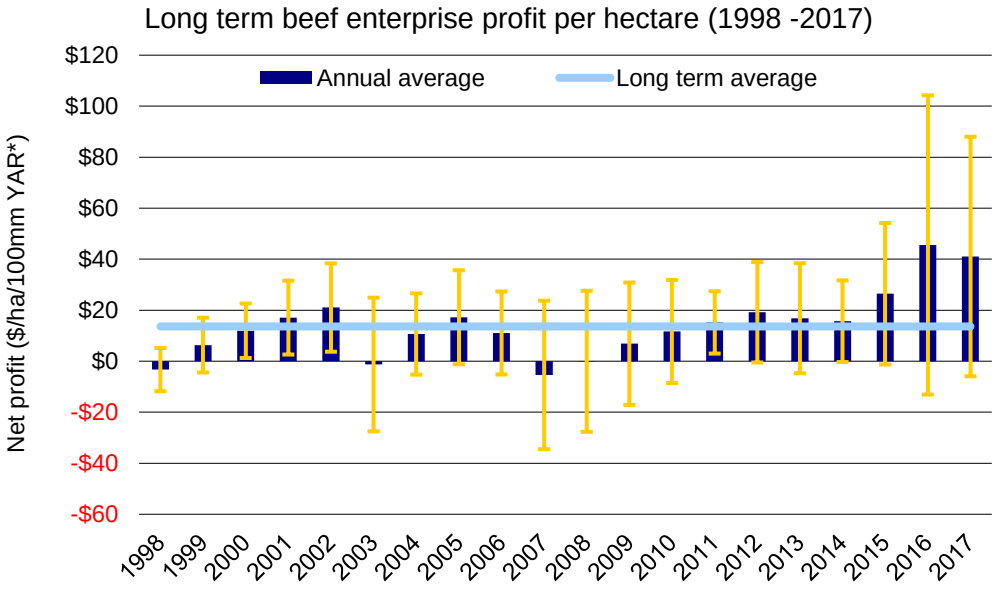


Figure 13 Annual average net profit per hectare per 100 millimetres of year analysed rainfall
*YAR - year analysed rainfall. Thin vertical bars represent one standard deviation from the mean.
Source: Holmes Sackett Pty Ltd Benchmarking Database 1998 to 2017

The beef herd performance shown in Figure 13 is derived from an analysis of self-replacing herds only. Information from cattle trading herds, where animals are purchased with the intention of growing or fattening to be sold, is not included in this graph.

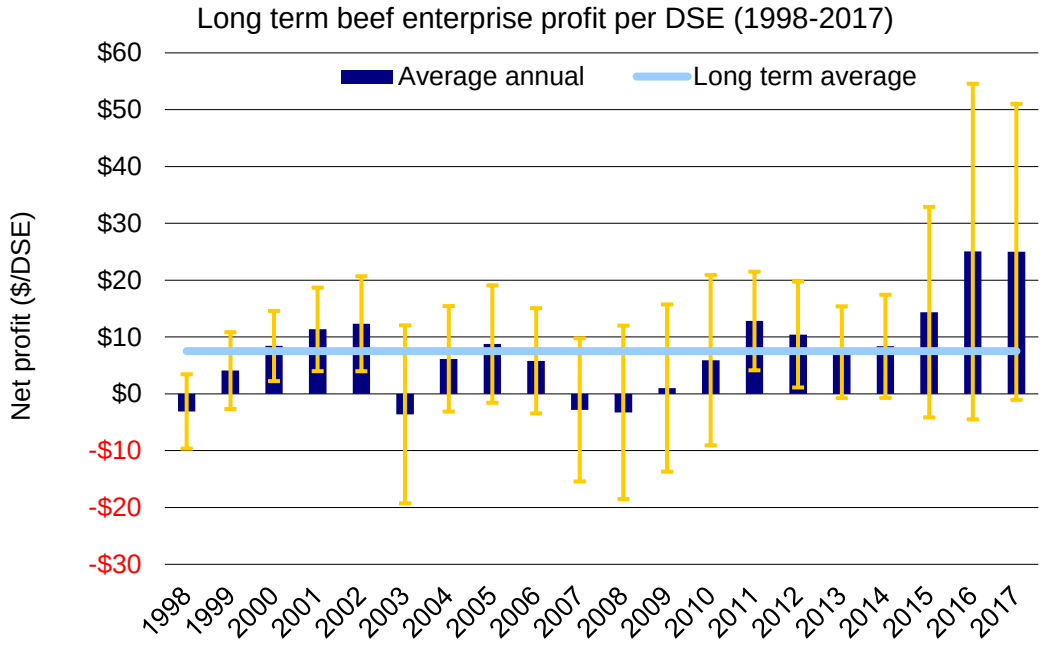


Figure 14 The trend in per DSE profits is similar to profits per hectare per 100 millimetres of rainfall
Source: Holmes Sackett Pty Ltd Benchmarking Database 1998 to 2017

Figure 14 shows long term profits of beef breeding enterprises expressed in dollars per DSE. The trend is similar to profit per hectare per 100 millimetres of rainfall with the highs and lows occurring in similar years. Over the long term the average net profit of beef enterprises is $7.50 per DSE.

The vast majority of beef production enterprises rely on pasture and specialist crops for their production systems. Within the breeding herds represented in the data set, the target markets range from 6 month old store weaners through to the production of trading animals exceeding 600 kilograms liveweight and exceeding 24 months of age. The most typical system represented in the data is a winter to spring calving beef herd producing trading cattle to meet feedlot entry or MSA specifications. It is not within the bounds of this document to provide detailed profitability analysis, of the main enterprise structure and environment combinations however the market environment and the principals that separate the more profitable beef producers from the remainder will be covered.

3.2 Current beef enterprise performance – average and top 20%

Table 2 shows the financial, production and other performance measures of beef enterprises for 2017. The measures are shown for the average of all data, the average of those ranking above the 80th percentile for profit (Top 20%) and the average of those ranking below the 80th profit percentile (Lower 80%). Rankings have been made on both a profit (EBIT) per DSE basis and a profit per hectare per 100 millimetres of rainfall basis.

The average others data set excludes those ranking above the 80th percentile. It is possible to determine the extent to which those in the upper 80th percentile weight the average by comparing the average of all data with the average of those below the 80th percentile. Profit is weighted by greater than $5 per DSE and greater than $8 per hectare per 100 millimetres of rainfall with the inclusion of the top 20% in the average.

Table 2 Key performance indicators of average and top 20% beef producing enterprises in 2017.

		Rank $/DSE profit		Rank $/ha/100mm	
	Average all	Top 20%	Average others	Top 20%	Average others
Number	82	17	65	17	65
Gross profit ($/DSE#)	**$57.75**	**$82.52**	**$51.27**	**$76.63**	**$52.81**
Animal health & breeding ($/DSE)	$1.87	$2.16	$1.79	$1.82	$1.88
Contract services ($/DSE)	$0.38	$0.21	$0.42	$0.35	$0.38
Freight ($/DSE)	$0.88	$0.88	$0.88	$0.63	$0.95
Insurance ($/DSE)	$0.06	$0.02	$0.06	$0.03	$0.06
Materials ($/DSE)	$0.14	$0.10	$0.15	$0.12	$0.14
Selling costs ($/DSE)	$3.01	$3.98	$2.75	$4.51	$2.61
Supplementary feed ($/DSE)	$2.95	$3.34	$2.84	$3.72	$2.74
Total enterprise expense ($/DSE)	**$9.27**	**$10.69**	**$8.89**	**$11.18**	**$8.77**
Gross margin ($/DSE)	**$48.48**	**$71.83**	**$42.38**	**$65.46**	**$44.04**
Administration ($/DSE)	$1.43	$2.55	$1.14	$2.18	$1.24
Chemicals ($/DSE)	$0.49	$0.24	$0.55	$0.28	$0.54

Contract Services OH ($/DSE)	$0.69	$0.51	$0.74	$0.80	$0.66
Depreciation ($/DSE)	$0.99	$0.87	$1.02	$0.76	$1.05
Electricity & gas ($/DSE)	$0.42	$0.42	$0.42	$0.33	$0.44
Fertiliser ($/DSE)	$3.62	$3.00	$3.78	$4.24	$3.46
Fuel & lubricants ($/DSE)	$0.74	$0.62	$0.77	$0.58	$0.79
Insurance OH ($/DSE)	$0.62	$0.95	$0.53	$0.59	$0.63
Irrigation ($/DSE)	$0.02	$0.03	$0.02	$0.03	$0.02
Landcare ($/DSE)	$0.20	$0.69	$0.07	$0.19	$0.20
Lime/gypsum ($/DSE)	$0.44	$0.17	$0.51	$0.14	$0.52
Materials OH ($/DSE)	$0.36	$0.56	$0.31	$0.44	$0.34
Motor vehicles ($/DSE)	$0.77	$0.47	$0.85	$0.51	$0.84
Rates & rents ($/DSE)	$1.06	$1.26	$1.00	$0.92	$1.09
Repairs & maintenance ($/DSE)	$2.30	$1.84	$2.42	$1.84	$2.42
Seed ($/DSE)	$0.52	$0.19	$0.60	$0.29	$0.58
Wages ($/DSE)	$3.62	$2.02	$4.05	$2.62	$3.89
Wages owner ($/DSE)	$5.20	$5.87	$5.03	$3.47	$5.66
Total overhead expense ($/DSE)	**$23.50**	**$22.27**	**$23.82**	**$20.20**	**$24.36**
Net profit ($/DSE)	**$24.98**	**$49.56**	**$18.56**	**$45.25**	**$19.68**
Net profit ($/ha/100mm YAR^)	**$41.06**	**$71.76**	**$33.03**	**$92.25**	**$27.67**
Cost of production ($/kg LW)	$1.84	$1.52	$1.93	$1.59	$1.91
Price received ($/kg LW)	$3.25	$3.59	$3.16	$3.67	$3.14
Sale price ($/head sold)	$1,430	$1,641	$1,375	$1,587	$1,389
Production (kg beef/ha)	226.4	230.7	225.3	306.3	205.5
Production (kg beef/ha/100mm)	29.2	30.3	28.9	41.6	25.9
Mid winter stocking rate (DSE/ha)	10.6	10.0	10.8	13.2	9.9
Average annual stocking rate (DSE/ha)	12.2	10.6	12.6	15.7	11.2
AASR* (DSE/ha/100mm YAR^)	1.6	1.4	1.6	2.2	1.4
Production (kg LW/DSE)	18.8	22.0	17.9	19.8	18.5
Production (kg LW/head sold)	441.3	464.9	435.2	438.3	442.1
Labour efficiency (DSE/labour unit)	14,633	16,719	14,088	19,567	13,343
Enterprise size (DSE managed)	11,631	9,908	12,082	17,088	10,204

#DSE - dry sheep equivalent
^YAR - year analysed rainfall
*AASR - average annual stocking rate

Source: Holmes Sackett Pty Ltd Benchmarking Database 2017

In 2017 the magnitude of the difference in profit per DSE of the top 20% relative to the average is approximately $30 per DSE where beef businesses are ranked per DSE and $25 per DSE where ranked per hectare. Those in the top 20 percent generated over three times as much profit per hectare as those in the lower 80 percent and over twice as much as the average of all. This equates the top 20 percent generating more than $460 and $360 per hectare than the lower 80 percent and the average of all respectively.

The metrics that differentiated the top 20% from the remainder on a per DSE basis in 2017 include:

- higher income derived from a combination of higher price and far higher per DSE production

- a lower average annual stocking rate per hectare and per hectare per 100 millimetres rainfall
- a lower cost of production driven primarily by greater production more so than by a lower cost structure per productive unit.
- far greater production per DSE and marginally higher production per hectare
- more production per head sold
- greater labour efficiency although not having a significant impact on overhead expenses.

The metrics that differentiated the top 20% from the remainder on a per hectare basis in 2017 include:

- higher income derived from a combination of higher price and marginally higher per DSE production
- a far higher annual stocking rate per hectare and per hectare per 100 millimetres rainfall
- higher enterprise expenses but lower overhead expenses
- a lower cost of production driven primarily by greater production more so than by a lower cost structure per productive unit.
- Marginally greater production per DSE and far greater production per hectare
- less production per head sold
- lower cost of production
- far higher labour efficiency with an apparently large impact on overhead costs.

Those who ranked in the top 20 percent on a per hectare basis had lower per DSE production relative to those who ranked in the top 20 percent on a per DSE basis but generated an additional 11 kilograms liveweight of beef per hectare for every 100 millimetres of rainfall received. At the profit line this created an additional $21 per hectare per 100 millimetres of rainfall. After adjusting for differences in rainfall between cohorts this equates to $132 of additional profit per hectare.

It makes financial sense to manage for the greatest returns per hectare rather than the greatest returns per head (or per DSE) because the majority of capital invested in beef operations is in land while the minority is in the livestock running on that land.

3.3 Long term beef enterprise performance – average and top 20%

Outputs from analysis of a single year of beef benchmarking data can be misleading. Key benchmarks can be inflated because no single year takes into account the ability to deliver higher than average profits on a consistent basis. Analysis of beef enterprise production and management over a longer (5 year) time frame minimises the probability that random events are responsible for outcomes resulting in inclusion in the top 20% profit generators. This is why it is generally more desirable to take a longer term assessment of farm business and enterprise performance than assessment of any single year in isolation.

An analysis of long term benchmarking participants has been conducted in order to assess some of the key characteristics of those beef producers generating the highest per hectare and per DSE profits. The period analysed is 2013 to 2017 (Table 3). In order to qualify as one of the highest profit generating six beef producers the following criteria had to have been met:

1. Must have benchmarking data for the last five years
2. Must be the highest ranked profit generating beef producers, of long term beef enterprises benchmarked.
3. Must be ranked highest on both profit per hectare per 100 millimetres of rainfall and profit per DSE basis.

Long term benchmarking participants, for the purposes of this analysis, are those who have contributed five or more years of data in the last ten years. The analysis differentiates between the highest profit generators (HP top 6), the average of all long term beef benchmarking participants (Average all) and the average of the others which is the average of all exclusive of the top 6 (Average others). The highest profit generators have been categorised into those who appear to be generating higher levels of gross profit /income per DSE (3 more intensive) and those that are generating lower income per DSE (3 less intensive).

The exclusion of the highest profit generating beef producers from the average (average others) allows for the weighting of the highest profit producers on the average to be assessed. This is done by comparing the average of all with the average of others. These producers can be used to set benchmarks for long term performance.

***Table 3** Five year average comparison of key performance indicators of the highest profit producers with the average of all producers and the average of the others (2013-2017)*

	HP 6	3 high income	3 low cost	Average all	Average others
Gross profit ($/DSE)	**$47.60**	**$51.58**	**$43.62**	**$43.89**	**$43.41**
An health & breeding ($/DSE)	$1.34	$1.43	$1.24	$1.55	$1.59
Contract services ($/DSE)	$0.31	$0.50	$0.13	$0.21	$0.19
Freight ($/DSE)	$0.55	$0.72	$0.38	$1.14	$1.22
Insurance ($/DSE)	$0.01	$0.03	$0.00	$0.13	$0.14
Materials ($/DSE)	$0.08	$0.13	$0.02	$0.17	$0.19
Selling costs ($/DSE)	$2.16	$1.50	$2.82	$2.75	$2.84
Supplementary feed ($/DSE)	$3.81	$5.43	$2.19	$4.25	$4.31
Total enterprise expense ($/DSE)	**$8.26**	**$9.75**	**$6.77**	**$10.20**	**$10.48**
Gross margin ($/DSE)	**$39.34**	**$41.83**	**$36.85**	**$33.69**	**$32.93**
Administration ($/DSE)	$1.03	$0.94	$1.11	$1.25	$1.28
Chemicals ($/DSE)	$0.22	$0.31	$0.14	$0.26	$0.27
Contract Services OH ($/DSE)	$0.22	$0.34	$0.09	$0.31	$0.32
Depreciation ($/DSE)	$0.46	$0.63	$0.29	$0.78	$0.81
Electricity & gas ($/DSE)	$0.57	$0.62	$0.53	$0.44	$0.45
Fertiliser ($/DSE)	$2.68	$3.07	$2.28	$2.52	$2.49
Fuel & lubricants ($/DSE)	$0.49	$0.56	$0.41	$0.79	$0.83
Insurance OH ($/DSE)	$0.42	$0.48	$0.35	$0.57	$0.60
Irrigation ($/DSE)	$0.05	$0.08	$0.01	$0.04	$0.04
Landcare ($/DSE)	$0.24	$0.14	$0.34	$0.13	$0.13
Lime/gypsum ($/DSE)	$0.41	$0.34	$0.48	$0.28	$0.26
Materials OH ($/DSE)	$0.32	$0.58	$0.06	$0.30	$0.29
Motor vehicles ($/DSE)	$0.41	$0.56	$0.25	$0.61	$0.63
Rates & rents ($/DSE)	$0.76	$0.84	$0.68	$0.87	$0.88
Repairs & maintenance ($/DSE)	$1.90	$1.67	$2.14	$1.94	$1.95
Seed ($/DSE)	$0.29	$0.45	$0.12	$0.23	$0.22

Wages ($/DSE)	$2.35	$3.14	$1.56	$3.21	$3.33
Wages owner ($/DSE)	$2.50	$2.84	$2.16	$3.01	$3.10
Total overhead expense ($/DSE)	**$15.30**	**$17.57**	**$13.03**	**$17.52**	**$17.86**
Net profit ($/DSE)	**$24.04**	**$24.26**	**$23.82**	**$16.17**	**$15.07**
Net Profit ($/ha/100mm YAR)	**$51.86**	**$48.76**	**$54.96**	**$31.81**	**$28.89**
Cost of production ($/Kg LW)	$1.12	$1.24	$1.00	$1.47	$1.53
Price received ($/Kg LW Sold)	$2.36	$2.37	$2.34	$2.16	$2.14
Sale price ($/Head Sold)	$1,162	$1,239	$1,085	$945	$916
Production (Kg beef LW/ha)	288	295	281	237.5	230.0
Production (Kg beef LW/ha/100mm)	46.9	45.3	48.6	38.8	37.6
Mid winter stocking rate (DSE/ha)	12.0	11.1	12.8	10.5	10.3
Average annual stocking rate (DSE/ha)	14.0	13.6	14.4	12.1	11.8
AASR (DSE/ha/100mm YAR^)	2.3	2.1	2.5	2.0	1.9
Production (Kg LW/DSE)	20.9	22.1	19.7	19.7	19.6
Production (Kg LW/head sold)	494	521	467	436.0	427.5
Labour efficiency (DSE/labour unit)	16,818	13,069	20,568	14,903	14,609
Enterprise size (DSE managed)	14,023	12,806	15,239	13,271	13,139

#AASR - average annual stocking rate

^YAR - year analysed rainfall

*DSE - dry sheep equivalent

The metrics that differentiate the six beef managers generating the highest profits from the remainder in over the long term include:

- higher income derived from a combination of higher price and greater production per DSE
- higher average annual stocking rate per hectare per 100 millimetres rainfall
- lower enterprise expenses and lower overhead expenses
- higher production per DSE, per head sold and per hectare per 100 millimetres of rainfall
- higher labour efficiency
- marginally larger enterprise size
- a significantly lower cost of production

The proportion of gross profit (sales plus change in inventory value less purchases) that is retained as net profit by the highest profit generators is over 50 percent. This means that for every dollar generated fifty cents is retained as profit. This target has increased since the 2013 situation analysis due primarily to increase in prices. This compares with the average who are retaining closer to 35 percent of gross profit as net profit.

There is a solid relationship between the proportion of gross profit retained as net profit and cost of production. This means that a driver for retaining more gross profit as net profit is more kilograms of beef for every dollar spent.

3.3.1 Multiple pathways for high beef enterprise profits

An assessment of the top 6 producers shows that there appears to be two different pathways for generating high levels of profit. The first production strategy is a strategy pursuing higher per DSE and per head performance while the second is a strategy that has a focus on greater per hectare production at the cost of per head production.

3.3.2 High-income strategy

Producers pursuing the high-income strategy have higher per DSE production, higher per head turnoff weights resulting in higher income per DSE. Producers pursing this strategy also have a higher cost structure associated with the higher level of income per DSE. The cost of production of the high-income strategy is $1.24 per kilogram which is over $0.25 per kilogram lower than the average of all but $0.24 per kilogram higher than those pursuing the low-cost strategy.

At the production level producers following the high-income strategy generate higher production per DSE leading to higher average weight at sale but this come at the cost of per hectare production which is seven percent lower than those pursuing the low-cost strategy. The reason for this difference in per hectare production is explained by the lower stocking rate when compared with those pursuing the low-cost strategy. Due to the lower stocking rate per hectare and lower per hectare production net profit per hectare per 100 millimetres of rainfall is lower when compared with the highest profit generators pursuing the low-cost strategy.

3.3.3 Low cost strategy

Producers pursuing the low-cost strategy appear to have a greater focus on per hectare performance at the cost of per head and per DSE production. This results in $8 per DSE less income but it comes at a similar cost saving of $7.50 per DSE resulting in profit per DSE of $23.80, only $0.50 behind those pursuing the high-income strategy.

Those pursuing the low-cost strategy appear to prioritise per hectare production above all else. The annual stocking rate per hectare per 100 millimetres of year analysed rainfall, is 20 percent higher than the high-income producers and 30 percent higher than the average of all. This feed utilisation is driven primarily by a very good understanding of the feed supply curve and the matching of calving date and time of turnoff to the timing of feed supply in that curve. This differs for each of the producers as the shape of the curve differs for each producer. Average rainfall for beef businesses in this cohort ranged over the last five years from 523 millimetres to 674 millimetres which was between 10 and 15 percent lower than the long-term average.

3.3.4 Strategy differences

The high-income cohort of high profit producers spent $5.40 per DSE on supplementary feed which was $1.10 per DSE more than the average but $3.20 per DSE more than the low cost, high-profit cohort. Supplementary feed includes not only grain, hay and silage but also dual purpose or fodder crops where income is allocated to the crop and expense is allocated to the livestock operation. It is most likely that the supplementary feed of the high-income producers has been supplied to provide additional energy to increase weight gain on trading livestock during times when pasture-supplied energy restricts the rate of gain. They also spent $0.60 per DSE more than the average on fertiliser which was $0.80 per DSE more than the low-cost high profit producers. The cost magnitude changes per hectare due to differences in stocking rates between these cohorts.

This suggests that the high income high profit producers are heavily focused on driving per head production through the provision of a higher cost feed base. They actually achieve this goal but there is very little differentiating profits per hectare from the low-cost, high profit producers.

Labour and labour related expenses are an important component of a farm business cost structure as they account for approximately 50 percent of the total overhead cost structure. Labour and labour related expenses include wages, motor vehicle expenses, fuel and lubricants, depreciation and contract costs. The high-income cohort of high profit producers spent $8.10 per DSE on labour and labour related expenses. This was $0.90 lower than the average but $3.30 higher per DSE than the low cost high profit cohort.

While labour efficiency is not directly related to labour cost due to scale and differences in the cost of labour employed it can provide some guide of labour cost. Labour efficiency of those high profit, high income producers was 13,070 DSE per labour unit, which was 1,800 DSE per labour unit lower than the average and 7,500 DSE per labour unit lower than those high profit beef producers pursuing the low-cost pathway.

The combination of income generation and labour efficiency provides an additional measure of the efficiency of the cost of labour which is gross profit per labour unit. The high profit low cost beef managers generated $900,000 in gross profit per labour unit while the high profit high income beef producers generated $674,000 this was greater than the average who generated $634,200 per labour unit.

3.3.5 Targets for high profits

Assuming per hectare profits are a major motivator for beef production then the following long-term targets, based on the performance of some of the highest profit producers, should provide a useful guide.

- Retention of 50% of gross profit as net profit
- Systems with calving dates and times of turnoff that closely match feed supply with feed demand.
- Stocking rates of 2.5 DSE per hectare per 100 millimetres of rainfall received.
- Production of 20 kilograms liveweight beef per DSE managed per year.
- Production of 50 kilograms liveweight beef per hectare per 100 millimetres of year analysed rainfall.
- Levels of labour efficiency exceeding 15,000 DSE per labour unit.

Targets expressed per hectare per 100 millimetres of rainfall will not apply where rainfall is less than 450 millimetres or greater than 850 millimetres or where the physical resource base presents significant constraints to pasture growth.

This combination of key performance indicators (KPI) will deliver high profit performance but it may not be possible to achieve every KPI. For example, soil depth due to land class may be a greater constraint to pasture growth and subsequent beef production than rainfall thus the stocking rate target may never be achievable. Where other targets can't be met then alternative productivity measures may have to be commensurately higher to achieve target profit levels.

3.4 Beef enterprise performance across rainfall zones – average and top 20%

The features of the most profitable beef enterprises seen in 2017 are the same features that are observed over the longer term and across geographic zones. This is demonstrated in Table 4 which

shows the difference in top 20% and average beef enterprise performance across different rainfall zones.

Table 4 Key performance indicators of Southern Australian beef enterprises for three rainfall zones for the period 2008 to 2017. Source: Holmes Sackett farm benchmarking

Rainfall zone	<500mm	500-650mm		>650mm	
Performance group	Average	Average	Top 20%	Average	Top 20%
Gross profit ($/DSE)	**$33.51**	**$35.52**	**$41.63**	**$37.10**	**$39.85**
An health & breeding ($/DSE)	$0.89	$1.49	$1.76	$1.53	$1.23
Contract services ($/DSE)	$0.15	$0.10	$0.08	$0.28	$0.37
Freight ($/DSE)	$1.37	$0.56	$0.78	$0.53	$0.42
Insurance ($/DSE)	$0.16	$0.03	$0.01	$0.06	$0.06
Materials ($/DSE)	$0.38	$0.13	$0.15	$0.12	$0.04
Selling costs ($/DSE)	$2.23	$2.04	$2.06	$2.44	$2.32
Supplementary feed ($/DSE)	$4.09	$3.32	$2.77	$2.89	$2.82
Total enterprise expense ($/DSE)	**$9.26**	**$7.67**	**$7.61**	**$7.87**	**$7.26**
Gross margin ($/DSE)	**$24.25**	**$27.86**	**$34.02**	**$29.23**	**$32.60**
Administration ($/DSE)	$1.06	$0.99	$0.97	$1.15	$0.90
Chemicals ($/DSE)	$0.25	$0.20	$0.17	$0.27	$0.21
Contract Services OH ($/DSE)	$0.31	$0.18	$0.22	$0.35	$0.39
Depreciation ($/DSE)	$1.14	$0.71	$0.52	$0.78	$0.70
Electricity & gas ($/DSE)	$0.68	$0.32	$0.23	$0.29	$0.19
Fertiliser ($/DSE)	$1.30	$1.85	$1.68	$3.08	$3.13
Fuel & lubricants ($/DSE)	$1.08	$0.75	$0.50	$0.80	$0.56
Insurance OH ($/DSE)	$0.45	$0.41	$0.36	$0.46	$0.32
Irrigation ($/DSE)	$0.14	$0.03	$0.00	$0.02	$0.02
Landcare ($/DSE)	$0.11	$0.12	$0.18	$0.12	$0.07
Lime/gypsum ($/DSE)	$0.21	$0.25	$0.29	$0.28	$0.21
Materials OH ($/DSE)	$0.19	$0.25	$0.13	$0.30	$0.24
Motor vehicles ($/DSE)	$0.66	$0.35	$0.28	$0.60	$0.36
Rates & rents ($/DSE)	$0.99	$0.79	$0.72	$0.82	$0.66
Repairs & maintenance ($/DSE)	$1.97	$2.17	$1.78	$1.44	$1.06
Seed ($/DSE)	$0.17	$0.18	$0.20	$0.25	$0.23
Wages ($/DSE)	$5.55	$2.73	$2.17	$2.45	$1.65
Wages owner ($/DSE)	$1.63	$2.18	$2.34	$3.27	$2.56
Overhead expenses ($/DSE)	**$17.90**	**$14.45**	**$12.74**	**$16.72**	**$13.46**
Net profit ($/DSE)	**$6.35**	**$13.40**	**$21.28**	**$12.52**	**$19.14**
Net Profit ($/ha/100mm YAR)	**$3.31**	**$27.45**	**$53.63**	**$24.13**	**$46.53**
Cost of production ($/kg LW)	$1.57	$1.30	$0.97	$1.28	$1.02
Price received ($/kg LW sold)	$1.70	$1.99	$1.99	$1.94	$1.96
Sale price ($/head sold)	$684	$863	$880	$847	$875
Production (kg beef LW/ha)	75.8	202.6	267.3	276.3	358.7
Production (kg beef LW/ha/100mm)	18.0	36.4	50.2	39.1	52.7
Mid winter stocking rate (DSE/ha)	3.6	10.5	11.2	11.8	15.1
Av annual stocking rate* (DSE/ha)	3.6	10.9	12.5	14.1	17.6
AASR (DSE/ha/100mm YAR^)	0.8	2.0	2.5	2.0	2.6
Production (kg LW/DSE)	19.0	18.2	20.5	19.5	20.3
Production (kg LW/head sold)	395.4	432.7	445.4	436.0	446.9
Labour efficiency (DSE/labour unit)	11,869	16,281	16,594	13,589	17,183
Enterprise size (DSE managed)	5,178	9,863	10,045	13,272	12,945

Data for the 500-650 millimetre and >650 millimetre rainfall zones shown in Table 4 has been generated by analysing the benchmarking results of only those participants who have contributed in 5 of the last 10 years. There is insufficient data in each year of the <500 millimetre zone to generate top 20% profit generators every year thus only the average of all participants has been listed in that zone. Beef enterprises in this zone tend to be secondary enterprises running with other enterprises. Rankings for those in the top 20% are based on profit per hectare per 100 millimetres of year analysed rainfall. The top 20% refers to the average of those performers who were above the 80th percentile ranking for profit per hectare per 100 millimetres rainfall. The average is calculated by adding all data points, inclusive of those in the top 20%, for each specific key performance indicator and dividing by the number of data sets.

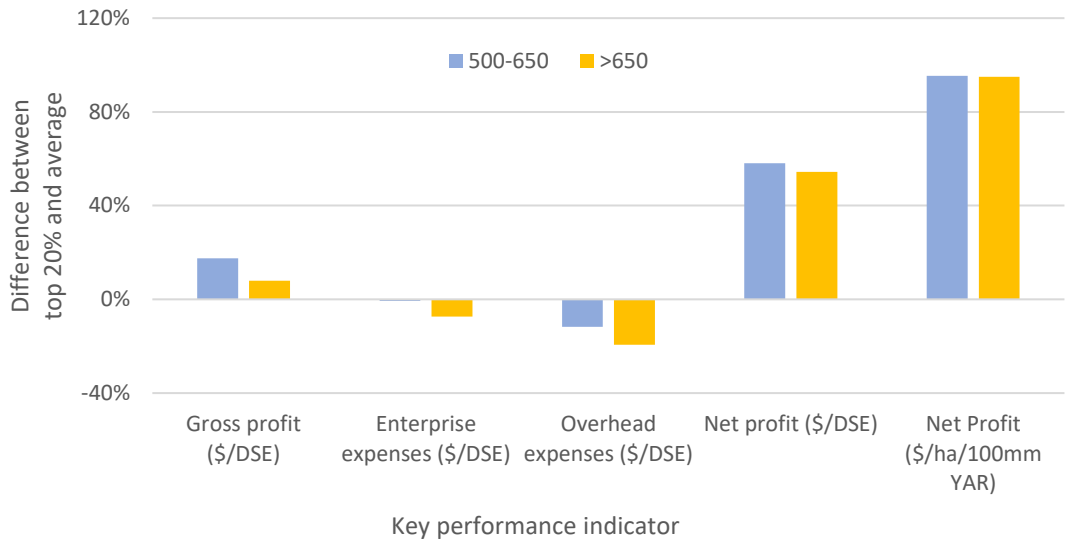


Figure 15 Small changes in income and expenses lead to large changes in profit
Source: Holmes Sackett farm benchmarking

Figure 15 shows the deviation, in percentage terms of the top 20% from the average in the 500-650 millimetre rainfall zone and the greater than 650 millimetre rainfall zone. The magnitude of difference in profit per DSE of the top 20% relative to the average is close to 60 percent in both rainfall zones however the way that this profit change was derived was different between zones. In the 500-650 millimetre rainfall zone the change in gross profit/income was 17 percent while costs were 13 percent lower. In the greater than 650 millimetre rainfall zone additional gross profit/income was only 8 percent while cost savings of the top 20% were 26 percent relative to the average.

The biggest difference of the top 20% relative to the average was net profit per hectare per 100 millimetres of rainfall which in both cases was an increase of close to 100 percent. Higher profits per hectare tend to drive higher operational returns on assets managed as, conventionally, land accounts for the largest proportion of assets under management in a beef operation.

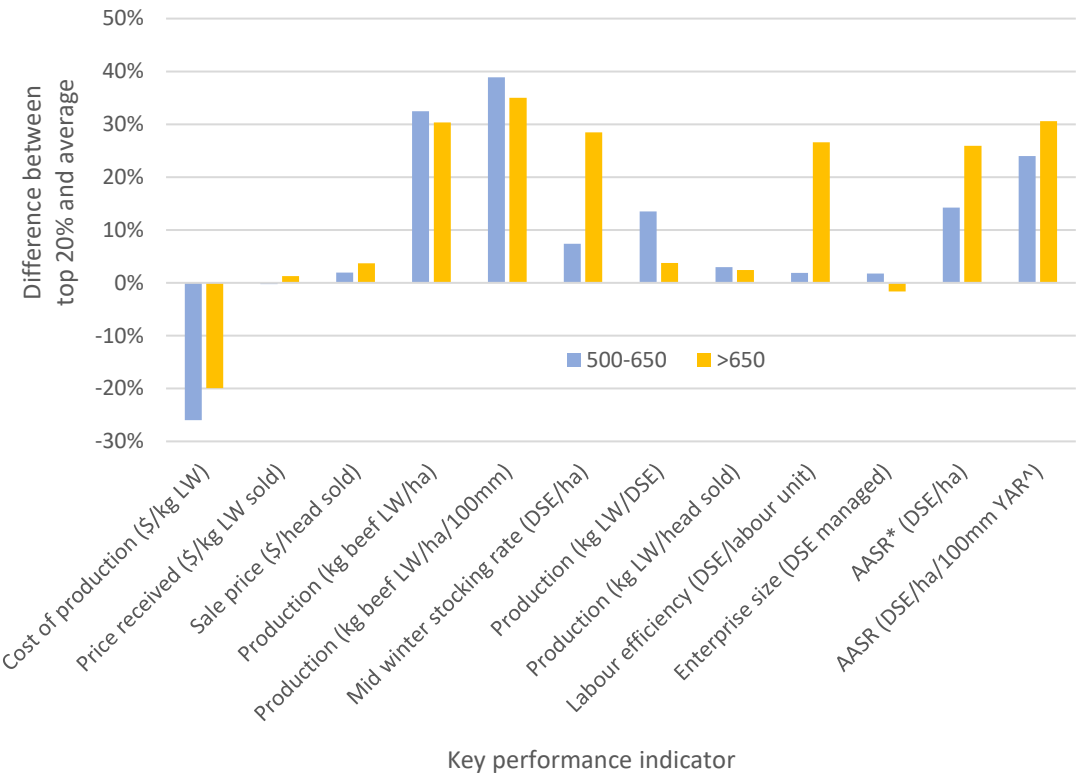


Figure 16 The majority of features of top beef performers only differ slightly between the medium and high rainfall zone apart from stocking rate and labour efficiency
*AASR – average annual stocking rate
*YAR – year analysed rainfall
Source: Holmes Sackett farm benchmarking

In the greater than 650 millimetre rainfall zone there is a smaller relative difference in per DSE production. The lower per DSE costs at the enterprise level were animal health and breeding costs and supplementary feeding costs. Twenty percent was the order of magnitude of lower overhead costs experienced by the top 20% relative to the average again as a result of additional livestock managed with a similar gross overhead cost structure.

Figure 16 is derived from the data in Table 4 and shows the relativity of production and other key performance measures of the top 20% compared with the average in two rainfall zones. The key points highlighted from this graph follow:

1. In the 500 to 650 millimetre rainfall zone the ten percent difference in production per DSE is the driver of additional income.
2. Price received has varied in only a minor way thus, over the long term, it has not been a key driver of any difference in profit.

3. Most of the expense differences in the 500 to 650 millimetre rainfall zone are at the overhead level and the lower cost here is typically seen where there is a higher relative stocking rate. This occurs as a similar gross overhead cost structure is spread over more productive units. This is effectively how economies of scale are achieved.
4. The lower overhead cost structure appears to be driven more by production per DSE than labour efficiency in the 500 to 650 millimetre rainfall zone while labour efficiency appears to account for more of the saving in the greater than 650 millimetre rainfall zone.
5. Feed utilisation assessed in the metrics as stocking rate per hectare per 100 millimetres of rainfall is 25 percent higher for the top 20% than the average in the 500 to 650 millimetre rainfall zone while it is 30 percent higher in the greater than 650 millimetre zone. Feed utilisation is discussed in more detail later in this report.
6. Production per DSE, per head and per hectare are all higher with per hectare being higher by the greatest magnitude.
7. Cost of production is between 20 and 25 percent lower due to the combination of superior systems, greater production and lower per DSE costs.

The key production features of the most profitable beef producers relative to the others over the long term are:

- Higher production which is usually achieved with superior resource efficiency.
- Efficient systems allowing for higher stocking rates which lead to better matching of feed supply with feed demand.
- Lower cost of production which is achieved through a combination of higher production, equivalent or lower operating costs and efficient systems that match feed supply to feed demand.

Between the medium and high rainfall zones there is little difference in profit per DSE. There is a large difference between the low rainfall zone and the other zones. This is due to a combination of the following:

- Lower price received. This is due primarily to the size of the data set more so than market disparity. There are few data points in the low rainfall zone and the data is weighted more heavily towards the early years in the ten-year period than the later years when prices were higher.
- Higher enterprise expenses with supplementary feed and freight, which is a component of selling costs, being the key areas of disparity.
- Higher overhead costs. Labour costs are higher in the low rainfall zone primarily because the beef enterprise tends not to be the enterprise of primary focus in these zones. It is usually an adjunct to a bigger sheep enterprise. This can be seen as enterprise size is approximately half the size of average beef herds in the other rainfall zones and labour efficiency is commensurately lower.

3.5 Impact of current and future prices for beef

Table 5 shows prices for the current analysis year (2017) relative to historical prices over the last 10 years. Also shown is the 2017 average cost of production. Beef prices for steers and cows were around the 90th percentile. The majority of the beef produced in southern systems comes from these two

livestock classes. The 2017 cost of production is $1.84 per kilogram liveweight. There is no distinction in the benchmarking methodology allocating cost of production between income streams (steers and cows) thus there is no difference between the two reported.

The story is similar for wool with prices currently at the 90th percentile and cost of production well below. Lamb in 2017 also experienced 90th percentile pricing however the gap between cost of production and price received is narrower. One of the key findings of the 2013 situation analysis was that wool and beef producers had faced median to low percentile pricing for a long period of time thus they learnt how to maintain a low the cost of production. The same could not be said for lamb where cost of production had crept up such that there was little difference in margin even though prices increased. Wool and beef have retained the margins however it is on the back of strong pricing. It will be important over the coming years that beef producers maintain the discipline that they showed prior to 2013.

Beef producers are currently well positioned to withstand price decreases and maintain reasonable margins on every kilogram of production. In fact, it won't be until prices reach the 30th percentile before losses are incurred provided the cost of production remains as it is in 2017.

Table 5 : Price percentiles (2008 to 2017) and 2017 prices for common broadacre commodities

Percentile	19 Micon	Trade Lamb	Mutton	Steers	Cows	Wheat (ASW)	Canola
	c/kg clean	c/kg dwt	c/kg dwt	c/kg lwt	c/kg lwt	$/tonne	$/tonne
100%	1960	690	529	391	256	490	800
90%	1578	600	423	323	224	337	620
80%	1457	562	397	277	184	313	580
70%	1383	532	368	213	143	295	560
60%	1289	509	341	204	137	283	542
50%	1235	486	313	195	131	276	531
40%	1195	466	283	190	127	268	520
30%	1135	433	236	183	124	250	501
20%	1083	401	193	175	121	225	490
10%	1030	358	165	169	116	204	455
0%	887	224	82	149	91	187	390
2017 Price	1654	610	423	348	230	216	532
2017 CoP	1064	481		184	184	167	409

Nearest percentile to 2017 price

Source: Independent commodity services (ic-s.net.au)

4 Keys to profitable beef production – beyond 2017

4.1 Changing cost of production

Cost of production is a ratio. It is calculated by dividing the total cost of producing each kilogram of beef by the number of kilograms produced. For example, a herd that produces 100,000 kilograms liveweight of beef for a total cost of $150,000 has a cost of production of $1.50 per kilogram liveweight.

$150,000 cost
100,000kg beef = $1.50 per kilogram liveweight

Cost of production can be reduced by increasing production, providing any associated cost increases are negligible, or of a smaller proportion. It is also possible to reduce cost of production by lowering costs and maintaining (or increasing) production.

Figure 17 shows nominal beef cost of production and price received per kilogram of beef liveweight sold for all beef breeding enterprises in the Holmes Sackett benchmarking database from 2008 until 2017. In the 2013 situation analysis the compounding rate of growth of both cost of production and price received both sat around 3% with trend lines sitting parallel with each other. This meant that, over the long term, margins were being maintained. The margin on each kilogram of beef sold is represented by the gap between the price received and the cost of production in Figure 17.

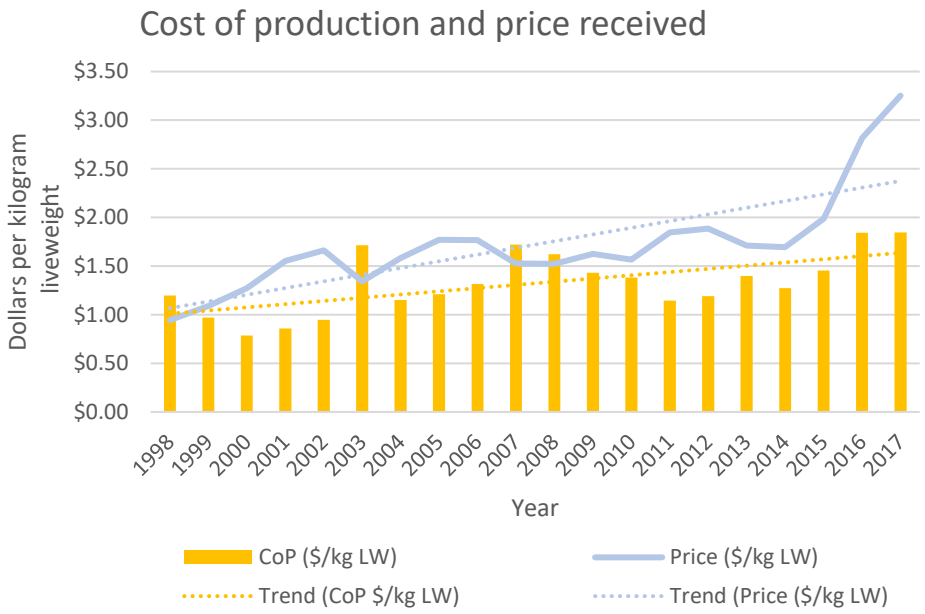


Figure 17: Beef cost of production, price received and trends over time (nominal)
Source: Holmes Sackett Pty Ltd Benchmarking Database 1998-2012

The large increases in price received for beef over the last three years relative to the preceding 17 years has weighted the compounding rate of growth in prices over the long term such that it now sits at 4.4 percent compounding, well above the 3 percent reported in the 2013 situation analysis. The rate of year on year increase in price received are shown in Figure 18.

The good news for most beef producers, so far, is that cost of production has not increased at the same rate as price received has over the last three years. This means that the margins on every kilogram of beef produced have grown over the last few years.

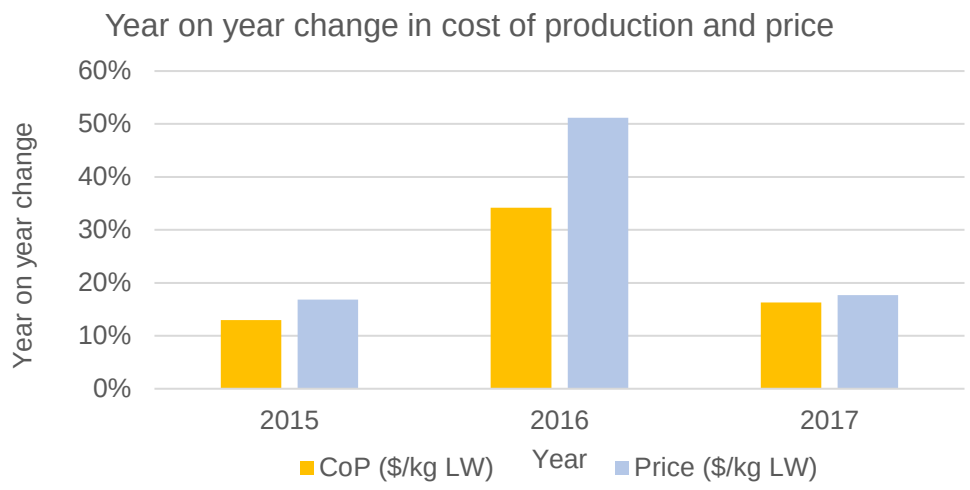


Figure 18: The year on year change in cost of production has been lower than that of price received.
Source: Holmes Sackett farm benchmarking

Figure 18 shows the extent of the year on year changes in price and cost of production from 2015 to 2017. For the majority of beef producers cost of production has increased by $0.57 per kilogram of liveweight of beef produced from 2014 to 2017 reflecting how quickly changes in cost of production can occur when prices increase. At the same time, the top 20% have increased cost of production by $0.67 per kilogram of liveweight produced over the same period. Given production levels have been maintained at relatively constant levels over the same period it would indicate that rising costs, rather than declining production, is the primary cause.

A comparison of the change in total expenses between the 2012 and 2017 years (to reflect the change between situation analyses) shows an in cost of over $10 for every DSE managed in the last five years. The key areas of cost increase over the period include animal health, selling costs and supplementary feed at the enterprise expense level. At the overhead level labour and labour related costs have increased by $4 per DSE while fertiliser costs have increased by $1.63 per DSE.

The numbers depict a slightly worse case than may actually have occurred due to a change in methodology in the 2017 year. The owner wages, which are a non-discretionary allocation for all owner managers, increased from $70,000 to $115,000 in the 2017 year. This represents an increase of 64% between years to reflect salary survey data showing that the total salary package value inclusive of wage, vehicle, board, superannuation and other on costs for a farm manager is $115,000. Of the total increase in costs this change in methodology represents approximately 20 percent.

At a time when prices are high, like they have been in 2016 and 2017, an increase in costs can make sense. The reason for this is that the rules for return on many investments related to beef production change where prices are high. Projects that, in the past resulted in marginal benefits, such as growing additional feed with the use of fertilisers or soil ameliorants or supplementary feeding, may now generate reasonable rates of return as a result of increased prices.

The pursuit of such investments still requires discretion. Fertiliser, supplementary feed and animal health costs are the key costs that have increased. These cost categories support the notion that beef producers are chasing additional production. The issue is that there is no evidence yet of achieving the additional production required to generate the returns on the marginal investment (Figure 19).

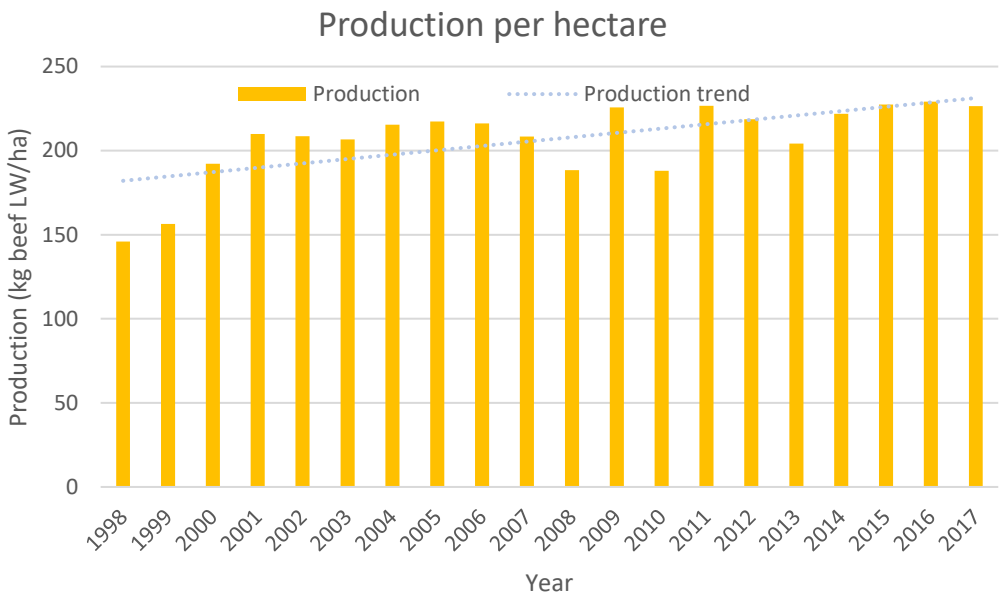


Figure 19 Production per hectare has increased at a rate of 1.3% compounding over the long term.
Source: Holmes Sackett farm benchmarking

The years when cost of production exceeds price received tend to be the drought years. These years hit beef enterprises hard due largely to lower production achieved and significant feeding costs incurred. It is nine years since a drought event of the magnitude that induced cost of production to exceed price received has occurred. A drought was experienced by a significant proportion of benchmarking participants in Southern Victoria and Tasmania in 2015 however strong beef prices and reasonable feed costs resulted in less severe reductions in profit than are typically the case. The fact that seasonal conditions were better to the north also assisted in the maintenance of prices for sale of cull livestock.

4.2 What are the priorities?

In any business there will always be some factors that result in relatively easy gains. These will include the implementation of low- or nil-cost strategies that improve productivity and dilute costs. Examples might include an adjustment of calving time or a change in target market to allow more efficient utilisation of pasture.

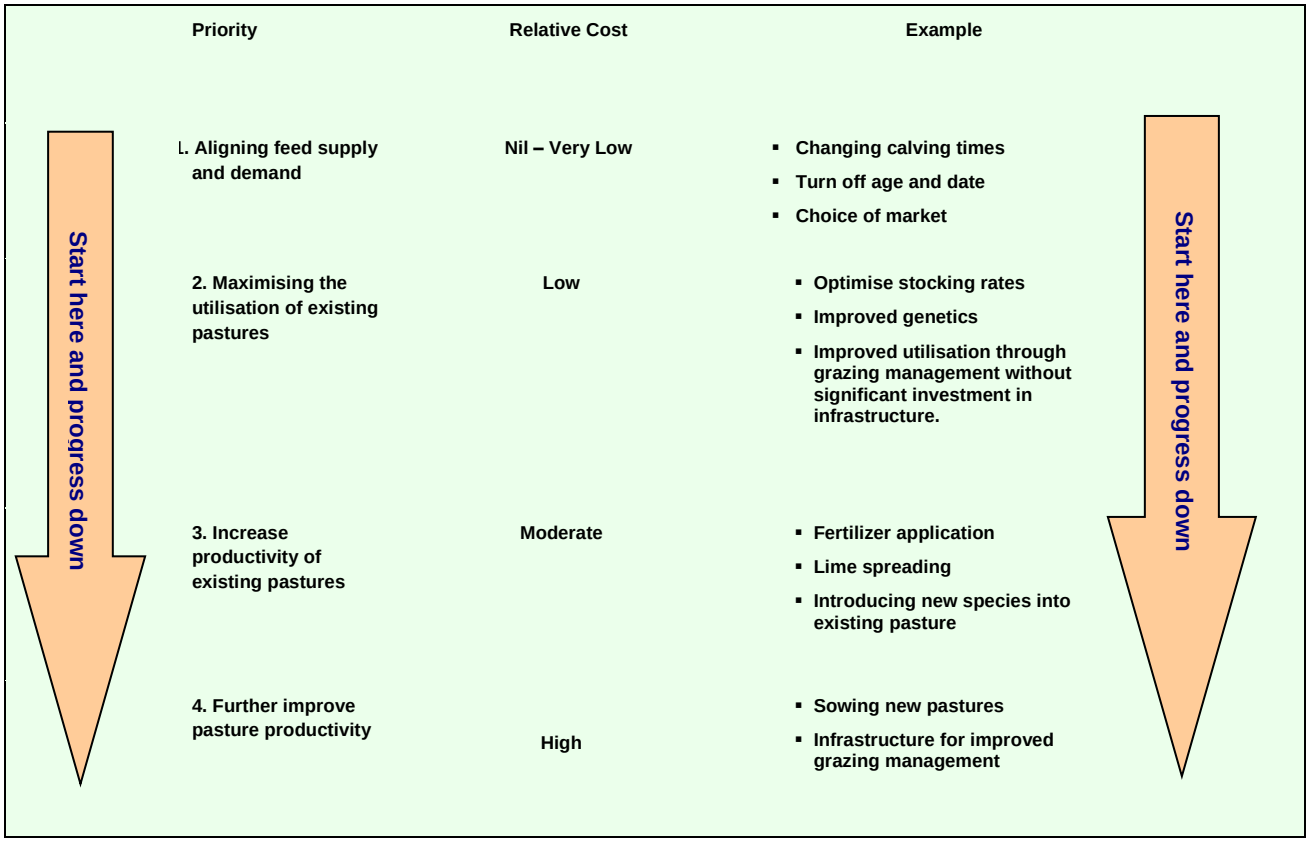
When it comes to per hectare production, the focus is about efficiently growing and using pasture. This generally comes at lower cost than fodder crops or supplementary feed. Ensure that the enterprise is already efficiently utilising the pastures that are currently grown; it makes little or no sense to grow more until this step is complete.

The next best investment returns are usually found by producing more pasture as cheaply as possible, and to concurrently match the additional feed with increased production per hectare. In higher

rainfall regions the most important technology for increased pasture production is fertiliser. There are smaller but still important gains that might be attained through grazing management practices that don't require additional infrastructure. In lower rainfall regions fertiliser opportunities might be more marginal.

Lower but often still adequate investment returns are then found through investment in longer-term payoff strategies such as lime application, sowing new pastures or grazing management techniques which require additional infrastructure investment. These priorities are illustrated in Figure 20.

Figure 20: Suggested program for improved productivity



4.3 Per hectare production

The analysis of the three high-profit, lowest cost producers (Table 3) showed that the pursuit of per hectare production over per head production resulted not only in the highest production per hectare but also the highest profit per hectare and the lowest cost of production. Given that the majority of the investment in beef enterprises is in the land associated with the growing of the beef rather than the heads that run on that land, it makes sense to generate the highest return on the largest component of the investment.

A suggested target productivity for efficient beef production is 45kg beef liveweight per hectare per 100 millimetres of rainfall received. This is a generic target based on the production of some of the highest profit beef producers over the long term. It is important to tailor this target to suit individual farm resources. That is, this target will not be achievable by all producers. For example, it is unrealistic to expect the same target to apply where the key constraint to pasture growth, and subsequent beef

production, is minimal soil depth and land class constraints. In this case, pasture growth and beef production is not constrained by rainfall but by other physical constraints.

Benchmarking data of the top 6 producers over the last five years demonstrates that stocking rates of 2.5 DSE per hectare per 100 millimetres of rainfall are required to achieve feed utilisation levels necessary to achieve the production target (50 kilograms of liveweight per hectare per 100 millimetres of rainfall). These targets must also be adjusted depending on the resource base. This can be done by measuring annual biomass by land class, optimising stocking rate based on the biomass and recording production per DSE.

It is necessary to exercise caution when identifying the optimum stocking rate. It is better to be on the conservative side of optimum as overstocking can lead to long lasting or irreversible environmental degradation, the effects of which can be economically and environmentally catastrophic. Producers have a duty of care to act as custodians of the land. There are no grounds for overstocking.

4.3.1 Feed utilisation

The single biggest factor differentiating those that generate the most profit per hectare and the remainder is feed utilisation. Feed utilisation is measured as the percentage of feed consumed relative to feed available and grown.

To calculate feed utilisation at a whole farm level it is necessary to understand the following:
- opening and closing feed measured in kilograms of dry matter per hectare
- wastage due to trampling, defecation and urination among other things.
- wastage due to pasture decay
- consumption by livestock class by stage of reproduction
- daily pasture growth rate

Perhaps the single biggest constraint to lifting per hectare production in the beef industry is the lack of simple tools to accurately and easily measure whole farm biomass at any point in time. Clearly there are huge labour benefits if this could be done with accuracy remotely but even a device that required regular appraisal would suffice. It is difficult to measure feed utilisation because two or more of the components necessary in its measurement are not readily measured across farm. These include whole farm pasture biomass at any point in time and wastage including decay/detachment and loss to trampling, urination, defecation and other causes. There is a level of technical understanding and skill development necessary before high levels of feed utilisation can be achieved. These include:

1. Understanding the shape of the feed supply curve and reliability of pasture supply during the year. The shape of the feed supply curve serves the purpose of assisting to identify the following:
    a. The period of greatest feed constraint during the year
    b. The period when pasture growth is increasing rapidly to determine a suitable calving time
    c. The period when pasture growth is decreasing rapidly to determine a suitable time of turn off.

Understanding the reliability of feed supply is necessary to ensure that calving does not occur during the period of greatest unreliability of pasture growth and that tactical management can be established for this period.

2. Adoption and management of operational timings for calving, weaning and time of turnoff that fit with the shape of the feed supply curve and meet market specifications for trading livestock.
3. Understanding the importance and necessity of supplementary feeding to meet energy deficits and at times to meet biomass deficits. The highest profit producers all have supplementary feed as an annual cost in their systems. They understand and accept that there will be periods of energy deficit and they accept that supplementary feeding is the management solution for this. They associate the marginal cost of supplementary feeding in autumn with the marginal benefit of the additional weight gained by utilising more feed in the spring.

   The three lowest cost producers who had the highest levels of feed utilisation and highest levels of production per hectare had supplementary feed costs of $2.20 per DSE while the 3 high profit producers chasing higher per head performance had a supplementary feeding cost of $5.40 per DSE. This suggests that each may have a different paradigm on acceptable lower limits on cow condition score.

   In southern Australia there will be a considerable period during summer and autumn when feed quality will be low. Stock lose condition where energy utilised exceeds energy supplied. If there is no further condition in reserve the only option for supplying the energy deficit is supplementary feeding. An energy deficit cannot be compensated for by reducing stocking rate assuming there is no reserve condition score.

4.3.2 Weight and age at sale

The most profitable herds consistently produce more beef per hectare than the average. Part of this advantage is achieved through above-average kilograms of beef per head sold.

Because any beef herd has the potential to sell a mix of bullocks, steers, heifers, weaners or cows, the mix of livestock classes sold is just as important as the sale weights of individual classes. This is often not well understood. Higher than average sale weights are not achieved by selling animals of any class heavier per head, but rather by selling more heavy animals per unit of area. The highest profit herds sell a greater percentage of heavier classes of animals relative to total animals sold and therefore the average weight of all the animals sold is heavier.

4.3.3 Optimum herd weaning weight

The issue in cattle is less about calves weaned per cow joined than it is about calves weaned per cow pregnancy tested in calf. Because of the longer gestation period, longer effective working life and the relative ease of getting enough females in calf to compensate for the culling rate, there is most often a surplus of females in calf.

The main issue in beef herds is the weight of calves weaned per cow; this encompasses average calving date and dystocia rates. More calves born earlier in the calving span gives higher herd weaning weight due to a greater number of average growing days for the calves.

It is therefore also influenced by herd age structure, and therefore consideration needs to be given to the interacting impacts with average sale weight. The primary driver in herd weaning weight is management. Ensuring heifers are managed to calve early in the calving span will ensure efficient lifetime performance. The main genetic influence on weaning weight is via hybrid vigour. Crossbreeding systems have been demonstrated to have the potential to increase weaning weights by up to 23%. Source: http://mbfp-pastoral.mla.com.au/Cattle-genetics/2-Select-a-profitable-breed-or-crossbreeding-system-to-achieve-genetic-progress

The management of condition score at calving and joining has both primary and secondary influences on herd weaning weight, respectively. Management decisions related to tactical supplementary feeding and stocking rate adjustments can be used to manipulate optimum condition scores in cows. Condition score at calving and joining influence how quickly cows return to oestrus, and therefore set up how quickly the herd will calve in the subsequent year. Target condition scores at calving are 2.0 to 2.5. Source: http://mbfp.mla.com.au/Weaner-throughput/Tool-52-Condition-scoring-beef-cattle
Beef producers seem less focussed on using condition scoring as a tool for decision making relative to sheep producers. The condition scoring tools for cattle, may assist.

Management changes can also be used to set the lower limit on average age of calving by implementing a shorter joining period. Assuming a fixed weaning date, the average growing days per calf weaned for a nine week and eighteen-week calving span can be 258 versus 241, respectively. In this scenario, the shorter calving span and subsequently greater number of growing days could result in as much as a 13% increase in weaning weight.

If discretion is not exercised, the management influences can come at a significant cost, and therefore the sums must be done carefully to ensure that the changes are profitable from season to season. Too many herds achieve higher herd weaning weight at the cost of low per-hectare production.

4.4 Labour

Labour and labour related expenses represent up to 40% of the total cost of a beef business making it an important area to focus on when looking for business efficiencies. Labour efficiency is a useful measure as it assesses the number of livestock units relative to each operational labour unit employed within the business.

Labour efficiency in beef enterprises is measured in DSEs per labour unit. A labour unit is considered as any labour working within the beef enterprise without no distinction in ability or skill. A labour unit works 240 days per year after accounting for weekends and leave. All labour associated with managing and operating a beef herd is included in this calculation. This includes not only farm labour but other labour related to managing the beef operations which could include pregnancy testing contractors, mustering or yard work contractors, veterinarians, sowing and fertiliser spreading contractors. These contractors may contribute only a small proportion of total time or a large proportion depending on the operational requirements of the business.

Labour cost is not necessarily directly proportional to labour efficiency. The same level of labour efficiency can result in different labour costs because an operator has a lower weighted average cost

of labour than another. For example, an owner manager who conducts all of the operations on his/her beef enterprise is charged at $115,000 per annum. A larger scale business with one manager costing $115,000 and two jackaroos, each costing $40,000 per annum, has a weighted average cost of labour of $65,000. On a labour unit for labour unit basis the owner manager has nearly double the cost per labour unit. Therefore, it is possible to have the same level of labour efficiency but very different labour costs.

The increasing levels of labour efficiency in beef enterprises delivered in the 2013 beef situation analysis continues. Labour efficiency for the period from 1998 to 2017 are shown in Figure 21. While the rates at which labour efficiency is increasing have declined marginally relative to the last report the overall trend is for a 2% compounding rate of growth over the twenty-year data set. The trend is for the top 20 percent to track approximately 2,500 DSE per labour unit higher than the average. Increases in labour efficiency are largely achieved by increasing feed utilisation. Many producers who pursue this pathway find that it is possible to run the additional livestock without additional labour. Clearly this will depend on the combination of physical resources and the extent to which human resources are already at the limit.

Another labour related challenge for the beef industry is the adoption of labour saving devices and data tracking and management technologies without any change in the level of labour employed. There are a plethora of high cost handling devices that reduce the physical nature of operations and can save time but unless that results in the labour being made redundant or generating revenue elsewhere the investment in the device is unlikely to generate a reasonable rate of return.

Data collection and data management through individual electronic identification is another source of potential increased labour cost if not well managed. The investment in capital equipment and software to collect data the provides no marginal productivity benefit or cost saving is an example. The integration of electronic identification with robotic technologies has been shown to present opportunities for labour savings at reasonable cost in the rangelands. It appears that the technology precedes the useful application in the higher rainfall areas. (Source: eID Case study benefit cost analysis development B.GFB.1719).

The majority of beef businesses are still making many of these large capital expenditure decisions with no financial analysis or business case at all. Investment in improving business skills and assisting farm business managers with accountability mechanisms may go some way to improving this situation.

One feature of highly labour efficient businesses is to minimise the time spent handling the herd. Some highly labour efficient beef operators choose to change their system to minimise labour costs. For example, several high profit beef herds choose not to pregnancy test to save on a handling operation and instead they run a different herd structure and treat dry cows as trading animals. Having said this there is more to profit than just labour efficiency and the pursuit of labour efficiency if it comes at the cost of foregone profit or production is non sensical.

Infrastructure quality (labour saving, throughput and automation aspects) and the production systems employed are major drivers of labour efficiency in beef operations. Repairs and maintenance in beef enterprises can be a big sink for labour resource. Investing more heavily on high quality

fencing, gateways, and watering points usually reaps significant rewards in lower repairs and maintenance costs down the track.

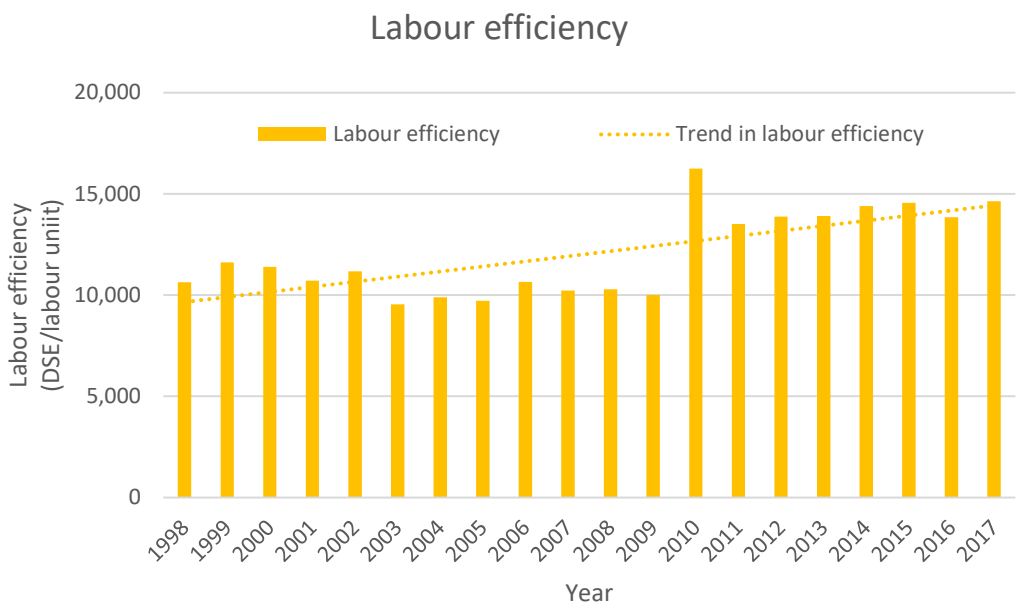


Figure 21 Growth in labour efficiency in beef enterprises continues to increase

Source: Holmes Sackett Pty Ltd Benchmarking Database

4.5 Business resilience to unfavourable seasonal conditions

Given the volatility in feed supply between years is large one of the most difficult decisions to make is the tactical decision regarding when to destock and/or feed animals through poor seasonal conditions early enough for action to be beneficial. Feed budgeting, even with its deficiencies in accuracy, is a useful tool to assist in projecting likely future feed requirements and the extent of any likely shortfall in feed for budgeting.

Beef enterprises experience a significant impact on per-hectare profitability during drought due to loss of production and increased feeding costs. Unlike wool production systems where wool prices do not change in response to drought, beef production and price tend to concurrently collapse where widespread droughts are experienced.

Despite ample evidence to the contrary there still appears to be a large proportion of beef producers who manage feed supply sub optimally as their strategy to manage dry times. Previous analysis of benchmarking performance prior to, and during, droughts demonstrates that management in the seasons prior to the drought does not determine the impact that drought will have on the business.

Further the opportunity cost of sub-optimal feed utilisation is high for the majority of years and does little to achieve the objective when the droughts do occur.

The highest profit producers who have high levels of feed utilisation tend to require higher levels of tactical management skill as they on the edge with feed supply more regularly than those at sub optimal levels. This means that they are making difficult decisions more regularly about

supplementary feeding or selling livestock due to seasonal conditions. Put simply, they act more quickly and efficiently in drought because the process is not foreign or uncomfortable to them. They go through the same decisions with up to three times the regularity than do those at sub optimal levels of feed utilisation.

Further, due to their higher levels of feed utilisation, they are forced to make decisions earlier. This doesn't mean that the outcome of their decisions is always right but it does mean that they have to be decisive. Selling decisions made earlier usually mean that there is less chance of the market having fallen when selling decisions are made. Those at lower levels of feed utilisation do have more time to make the decision as they have more feed for longer however benchmarking data shows that the time does not appear to reduce their losses in drought. The delay in decision can lead to a false sense of security which ends up in no decision being made at all.

There is significant room for improvement in beef herds with regard to drought management. Severe losses were incurred by the less productive and profitable producers during 2006 to 2008. This appeared to be due to poor decisions or, worse still no decisions, being made during that period. Tactical drought management is a critical skill that is necessary for achieving high levels of feed utilisation.

4.6 The path over the next five years?

This situation analysis has highlighted that the last three years have been an exceptional time for beef producers. Profits of the majority have never been better with price being the primary driver of the new profit paradigm. Herd average prices received for beef sold of $3.25 per kilogram liveweight are $1.56 higher than those received only 3 years ago representing a near doubling over that period.

Over the same period cost of production has increased by $0.40 per kilogram liveweight demonstrating the extent to which margins have increased. On average, seasonal conditions over the last three years have been favourable with the average deviation in actual from long term rainfall being no more than 15% in any year. This has maintained consistency of production and provided confidence to beef producers.

Per hectare production has not increased significantly since the 2013 situation analysis. It would appear that investment to achieve the gains has occurred. This is mixed news for the industry. On the one hand it is great to see additional investment in the costs that are most likely to achieve additional production gains. It is possible that the research and extension efforts are delivering results. On the other hand, the data to date shows that the gains have not yet materialised into additional production. It will be necessary to watch this space to see whether the investments are still to pay off into the future.

Labour efficiency has increased at a steady rate and the challenge will be to keep the same growth rates in this area as have been seen in the past. The biggest opportunity is for the average producer to improve feed utilisation with the existing labour force as this will automatically drive labour efficiency. Further opportunities are for investment in infrastructure, automation and technology.

The number one production issue facing the majority of beef producers is low levels of feed utilisation. High profit beef producers don't necessarily have better resources or grow more feed than the others, but they do consume more of the feed that they grow every year. The additional feed

consumption isn't just a function of more livestock per hectare, it is the implementation of sensible systems that focus primarily on the alignment of feed supply with feed demand but also with consideration of feed quality. Time of calving and time of turnoff are strategic decisions that heavily influence feed utilisation.

Opportunities for increasing beef production and profitability in southern Australia will come from skill development in increasing feed utilisation. Improving beef producer understanding of the feedbase, systems and their influence on livestock feed demands (feed budgeting) and investment in better tools to assist in biomass assessments will go a long way to building confidence in better utilising feed. Skill development in financial literacy and business management will assist in the identification of those investments that generate the best returns on investment.

5 Appendix

5.1 Important considerations and interpretation of situation analyses

5.1.1 What is a 'situation analysis'?

A situation analysis can take on a number of forms and utilise various methods of analysis to provide a snapshot of the current 'state of play' within a region, sector or industry. The aim of these analyses is to generate a greater understanding of the economic performance and issues impacting producers at the enterprise level. Importantly, these reports aim to complement other sources of data available on industry performance, including those from the Australian Bureau of Agricultural Resource Economics (ABARE) and the Australian Bureau of Statistics (ABS).

5.1.2 What is comparative analysis?

A commonly used method to underpin a situation analysis is known as a 'comparative analysis'. By definition, comparative analysis is simply comparing two or more systems to identify and explain points of difference and/or similarities, along with associated trends over time). The final output of a comparative analysis is an explanation of the drivers that directly and indirectly affect performance. These drivers are either causative (i.e. directly impact on performance) or associative (i.e. related parameters that won't or don't directly impact performance).

5.1.3 Limitations to comparative analysis

Comparative analysis compares systems with a variety of physical and social attributes (e.g. geographical location, skills, human and natural resource base, enterprise mix and attitude towards risk). The robustness of the results is highly proportional to the levels of uniformity in these parameters, as well as the overall sample size. The methods, calculations and units used for conducting a comparative or situation analysis, including measures of profitability and productivity, are highly variable between analysts and therefore care should be taken when interpreting and/or comparing results.

5.1.4 How should a situation analysis be interpreted?

When reading this report, it is important to remember that:

- Situation analyses are conducted using a sample dataset (only) of the total population to which the analyst has access to and this dataset is not necessarily reflective of the total population averages.
- As the sample has been taken from a specific dataset, the resulting analysis may be skewed or biased, and thus may not accurately reflect the overall picture for a given region or the broader industry.
- An analysis uses historical data across a defined period of time and thus provides possible trends or indicators of local, regional or national performance at that point in time, within a particular market and under seasonal conditions.

5.1.5 Southern beef situation analysis

- The “top” category does not necessarily include the same producers over consecutive years, due primarily to seasonal and market variations impacting year on year.
- The population sample on which the analysis is made may change from year-to-year, either deliberately in order to lessen statistical error or inadvertently in cases where the submission of data is voluntary.
- Wherever possible, a combination of available data sources should be used to make a more complete assessment of industry performance.

5.1.6 How is this information useful to producers?

Comparative analyses aim to highlight differences between the performance parameters of the “top” versus “average” producers. This information can be used to identify key issues and potential opportunities to improve one or more aspects of performance. In assessing these opportunities, it is important to prioritise and/or pursue them in accordance with the resources available (land, labour, skill and capital) and individual business and personal goals and limitations.