finalreport

Project code: B.COM.0351

Prepared by: Sandy McEachern
John Francis

Holmes Sackett

Date published: April 2014

ISBN: 9781740361880

PUBLISHED BY
Meat & Livestock Australia
Locked Bag 991
NORTH SYDNEY NSW 2059

Southern beef situation analysis

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government to support the research and development detailed in this publication.

Important considerations and interpretation of situation analyses

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).

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).

There are 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.

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.

- The “top” category does not necessarily include the same producers over consecutive years, namely due 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.

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.

Executive summary

This paper reports the historical and current profit and profitability of beef enterprises in southern Australia, with main focus on the last 3 years. The key differences between the most profitable producers and the others were identified in order to demonstrate the opportunity for improvement in profitability. The analysis was on data drawn predominantly from the Holmes Sackett benchmarking database over a 15-year period. The geographic area from which data has been collected includes southern Queensland, the New England, Tablelands, Slopes ,Wheat Sheep and pastoral zone of NSW, Victoria, Tasmania and South Australia

The major findings include:

- Profits of beef enterprises in the last year are high in relative terms and second only to 2002 levels.
- When compared to alternative enterprise choices over the long term, average beef profits per hectare exceeded wool but lagged dual-purpose, prime lamb and cropping enterprises.
- Over the last 15 years the average maximum profit per hectare of beef enterprises was lower than alternative enterprises. This is part of the reason for the lower relative performance when compared with alternative enterprises over the long term.
- Greater per hectare production is a key driver of higher profits with the most profitable beef producers consistently producing an additional 75 and 100 kilograms liveweight beef per hectare than the average.
- Beef producers with relatively low profitability will generate more profit and greater profitability by focusing on improving efficiencies in their existing enterprises rather than by changing to alternative enterprises.
- Between-year variability in profit has been lower for beef enterprises than for all other livestock enterprises.
- Exceptional sheep meat and wool prices over the last few years have led to far higher sheep profits relative to beef profits. Crop profits have the greatest between-year variability and the greatest losses during drought.
- The most efficient and profitable beef producers have a combination of higher productivity and a lower cost of production. They do not have the individual highest productivity or price.
- There is a trend for increasing cost of production in beef enterprises but, at the same time, production per DSE and per hectare has also increased. A production increase has been necessary to offset the increasing rate of growth in both enterprise and overhead expenses.

- Labour efficiency is a good news story for beef enterprises. Top 20% producers have seen increases in efficiency of 7,000 DSE per labour unit while average producers have seen increases of 4,000 DSE per labour unit over the last 10 years. Some of these efficiencies can be created at low cost while others require additional investment. The best labour managers now exceed 20,000 DSE per labour unit.
- Improvements in productivity require assessment of return on investment. Implementing systems that match feed supply with feed demand by and improving pasture utilisation are usually the lowest cost gains and, thus, should be the first steps. Growing more pasture should be a secondary consideration.
- In the main, increasing productivity in the herd is achieved through:
    - Optimising stocking rate – cost-effectively maximising and matching feed supply and demand, and the conversion of pasture into saleable product;
    - Ensuring optimum age and weight at sale – cost-effective management of nutrition and breeding to optimise specification compliance with the target market(s).

Table of contents

1 Introduction, study area and definitions

This paper investigates and reports the historical and current profit and profitability of beef enterprises in southern Australia, with main focus on the last 3 years. It also reports the variability in beef enterprise profits and considers why this variation occurs. The key differences between the most profitable producers and the others were identified in order to demonstrate the opportunity for improvement in profitability.

Data analysed for the southern beef situation analysis is extracted from farms with beef breeding enterprises located across NSW, Queensland, Tasmania and South Australia. In total 1,598 data points from 315 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.

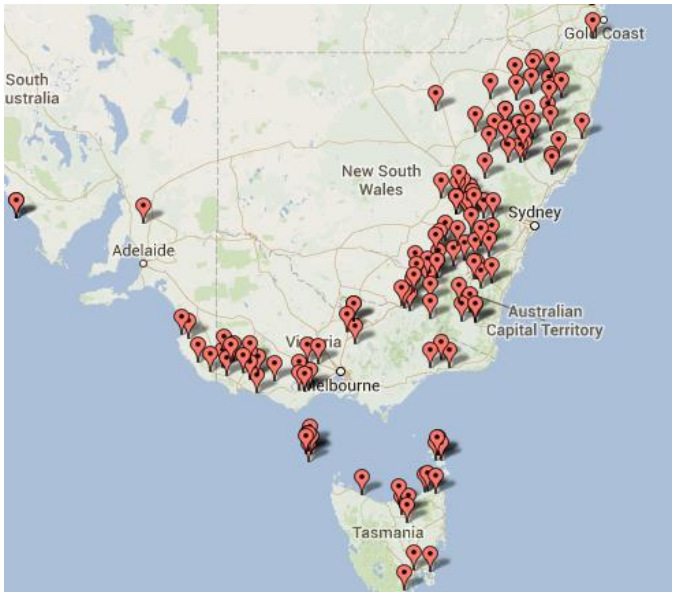


Figure 1: Locations of beef properties benchmarked in the >650mm rainfall zone (n = 959)

Map source: Google maps/BatchGeo

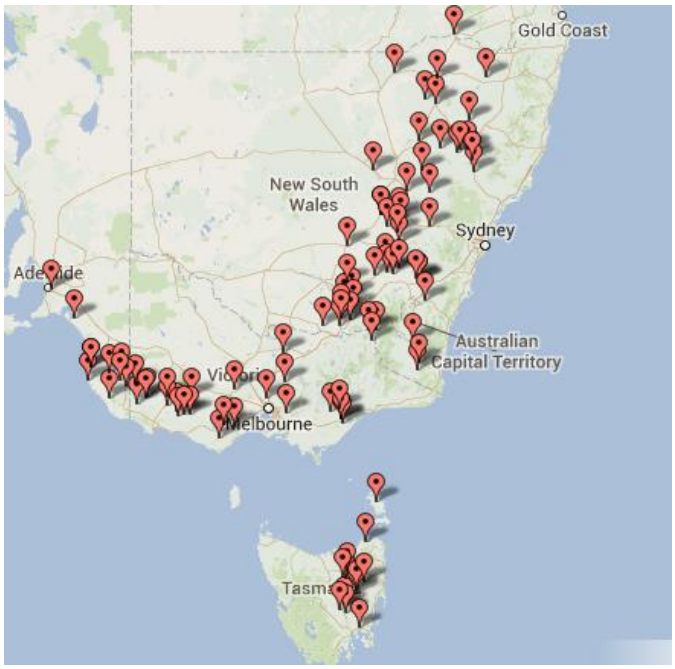


Figure 2: Locations of beef properties benchmarked in the 500-650mm rainfall zone (n = 473)

Map source: Google maps/BatchGeo

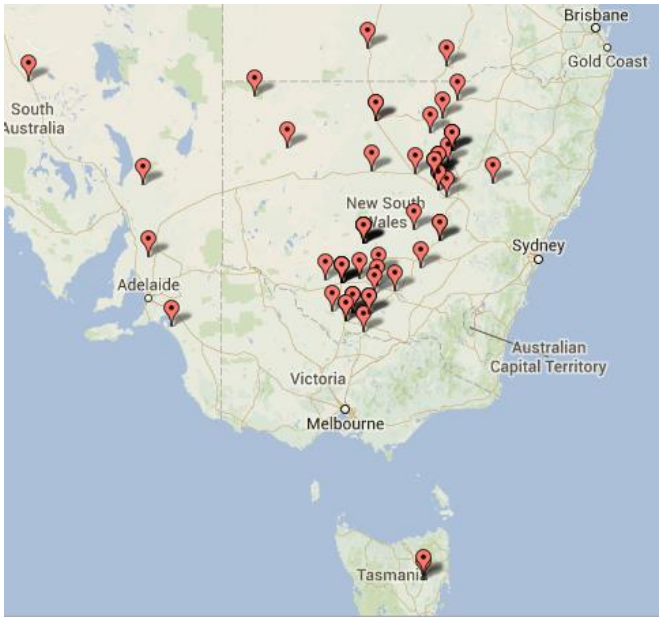


Figure 3: Locations of beef properties benchmarked in the <500mm rainfall zone (n = 166)

Map source: Google maps/BatchGeo

Net Profit

Net profit is defined as income adjusted for purchases of livestock and changes in livestock inventory less all expenses with the exceptions of capital equipment purchases, capital land developments, interest payments on loans and land lease costs. Depreciation on capital items is included as an expense and is

used in place of capital expenses. Owner drawings, as wages, are included in the expenses. Net profit is also referred to as earnings before interest and tax (EBIT).

Net profit is an absolute figure which distinguishes it from profitability. Profitability is a ratio of net profit relative to the value of the resources required to generate the profit. At the whole farm level, return to assets managed is a measure of profitability. It is calculated by dividing the net profit by the total value of farm assets under management. Usually land accounts for approximately 80% of the total farm asset value while livestock and plant and equipment account for the majority of the remaining 20%.
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.

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 relative to their sheep meat value. These flocks will include flocks where the more traditional first cross ewe (e.g. Border Leiceister 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)

These enterprises are those where there is significant wool income from the enterprise as well as prime lamb. The majority of these flocks consist of surplus ewes from specialist wool flocks joined to either a maternal or terminal sire. There are only a few such enterprises represented.

Wool enterprises (flocks)

These enterprises are predominantly self-replacing merino sheep enterprises. Some of these flocks keep wethers out to three years of age. There is the occasional enterprise where wethers are purchased in.

Dryland crop enterprises

Dryland crop enterprises are dominated by wheat and canola. Dryland crop profits were 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.
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 latter years of this data it equates to $70,000 for the first full time owner labour unit and then $50,000 for every subsequent full time labour unit.

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 that there has been no adjustment for inflation since it was collated to reflect the value in present day terms.

Dry sheep equivalent (DSE)

The DSE unit usually refers to the energy requirements of a young adult, 45 kilogram merino wether (castrated male sheep) to maintain its weight. 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 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.

Table 1 Beef DSE ratings

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

Relative profitability

Long-term beef enterprise profits lag behind lamb and crop enterprises but still exceed wool enterprises. High prices coupled with exceptional seasons over the last 3 years have boosted profits well above average and in line with those of the early 2000s.

The data presented in this report has been drawn predominantly from the Holmes Sackett benchmarking database over a 15 year period. Additional data includes Principle Focus and Pro Advice client data contributions. The geographic area from which data has been collected includes southern Queensland, the New England, Tablelands, Slopes ,Wheat Sheep and pastoral zone of NSW, Victoria, Tasmania and South Australia.

The benchmarked data presented is not drawn from a random sample of farms. Owners of farm businesses who choose to benchmark their performance are not a random sample. A comparison of the Holmes Sackett data set with the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) is shown in Table 2. This demonstrates that the average return on assets of the Holmes Sackett data set is over 1.5% higher than that of the ABARES data set over the last five years. Thus, average performance referenced in this report is not representative of the average for the industry as a whole.

***Table 2*: Return on Assets comparison – ABARES versus Holmes Sackett 2008 to 2012.**

Grazing Farms	2008	2009	2010	2011	2012
ABARES Return on assets	0.6%	0.8%	0.4%	1.4%	2.3%
ABARES number (n)	520	356	369	346	310
Holmes Sackett (HS) Return on assets	0.8%	1.3%	2.2%	5.5%	3.8%
Holmes Sackett number (n)	111	112	112	92	92
Difference (HS to ABARES)	0.2%	0.5%	1.8%	4.1%	1.5%

3 Current situation 2012

3.1 Relative profits

Beef enterprise profits are as high as they have been in historical terms however they are not experiencing the level of profits currently experienced by all types of sheep enterprises. In the last two years the average beef herd profit has been $17 per hectare per 100 mm of rainfall. This is approximately half the profit of sheep enterprises.

Sheep enterprises are currently enjoying superior average profits compared to beef and dryland cropping. Figure 4 shows profit by enterprise over the period of 15 years from 1998-2012. The fortunes of these industries have varied greatly, but in the last few years it has been sheep enterprises that have generated the highest profit.

Prime lamb enterprise profits have averaged $29 per hectare per 100 mm for the last two years. Dual purpose flocks have averaged $36 per hectare per 100 mm and wool flocks have averaged $32 per hectare per 100 mm, for the last two years.

Cropping is the most volatile enterprise but has not enjoyed a really good year recently. In the last two years it has had the worst performance with an average of $13 per hectare per 100 mm of rainfall.

Throughout this 15-year period the profitability of beef and sheep enterprises have generally fluctuated independently of each other. Wool and lamb production follow similar profit trends but, for the majority of the period with the exception of the last two years, lamb has had superior profitability compared to wool. In the last two years this has changed with wool flock profits outstripping those of specialist prime lamb flocks and dual purpose flocks were more profitable than either prime lamb or wool.

Figure 4 shows the profit of beef enterprises currently and historically. Currently beef enterprise profits mimic those of the early 2000s with the average of the last three years second only to the rolling three year average ending in 2002. While the recent years have provided strong nominal profits for beef they are still well below the profits of lamb. A key issue for some beef producers is the competition from sheep enterprises for the same resources on the same farm.

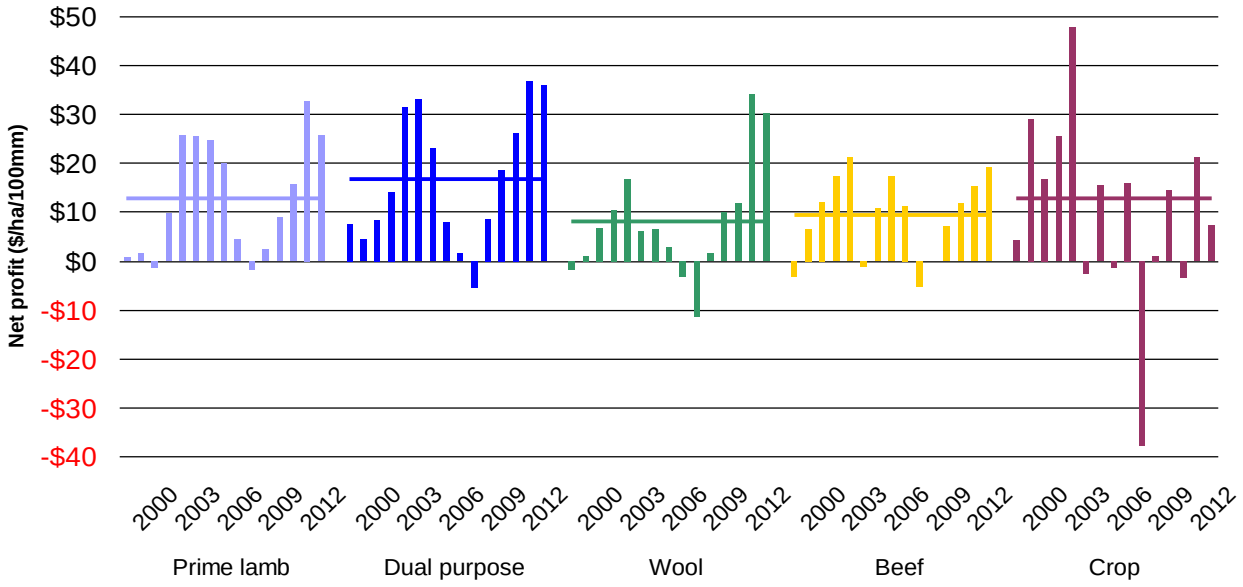


Figure 4: Nominal net profit per hectare per 100 mm of annual rainfall for wool flocks, beef herds, dual purpose and prime lamb flocks over 15 years from 1998 to 2012.

Source: Holmes Sackett Pty Ltd Benchmarking Database 1998 - 2012

A comparison of the average profit between beef enterprises, other livestock and crops in south east Australia over a 15 year period from 1998-2012 is shown in Figure 5. Net profit has been compared per hectare per 100 mm of rainfall to allow for comparison between cropping and livestock enterprises across zones.

Cropping, on many farms, occurs on the most productive land classes, while livestock are relegated to less productive land on average. Thus the returns of cropping enterprises may be biased. The extent of this bias is difficult to quantify.

Over the last 15 years beef enterprises are ranked fourth of the five enterprises. This is the same ranking for beef as was reported in the 2008 situation analysis. Changes since that report are that crop enterprises have slipped one position from second to third behind prime lamb and the gap between beef and wool has narrowed with a tripling of wool profits over the last two years (Figure 5).

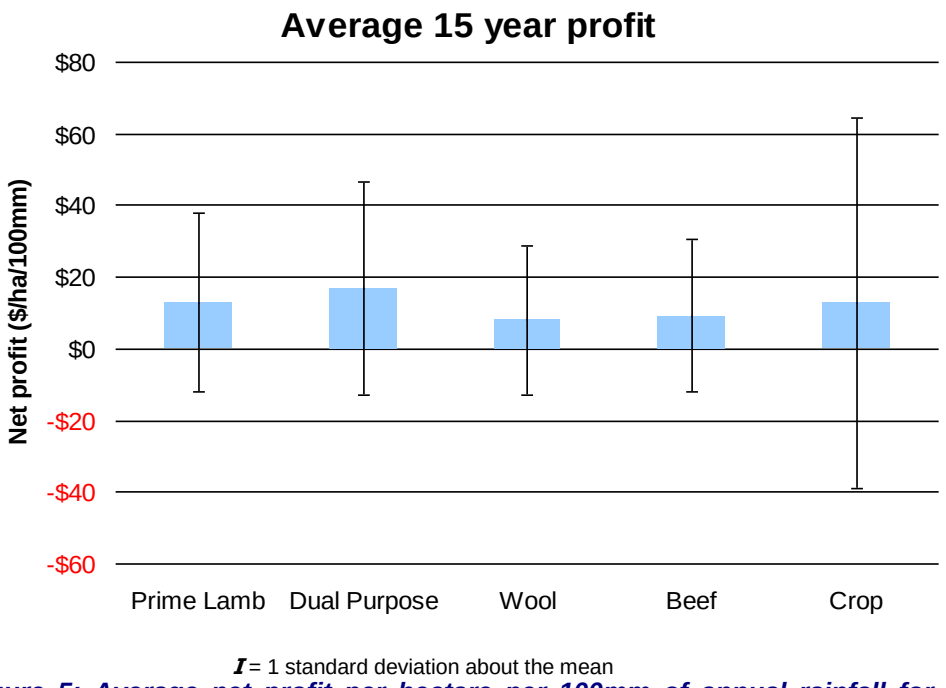


Figure 5: Average net profit per hectare per 100mm of annual rainfall for wool flocks, beef herds, dual purpose and prime lamb flocks, wheat and canola crops from 1998 to 2012.

Source: Holmes Sackett Pty Ltd Benchmarking Database 1998 to 2012

The change in ranking has been the result of unprecedented sheep and wool profits over the last few years. Figure 6 shows the average profits of each enterprise over the past five years. In order of profit it has been dual purpose enterprise followed by wool, prime lamb, beef and dryland cropping.

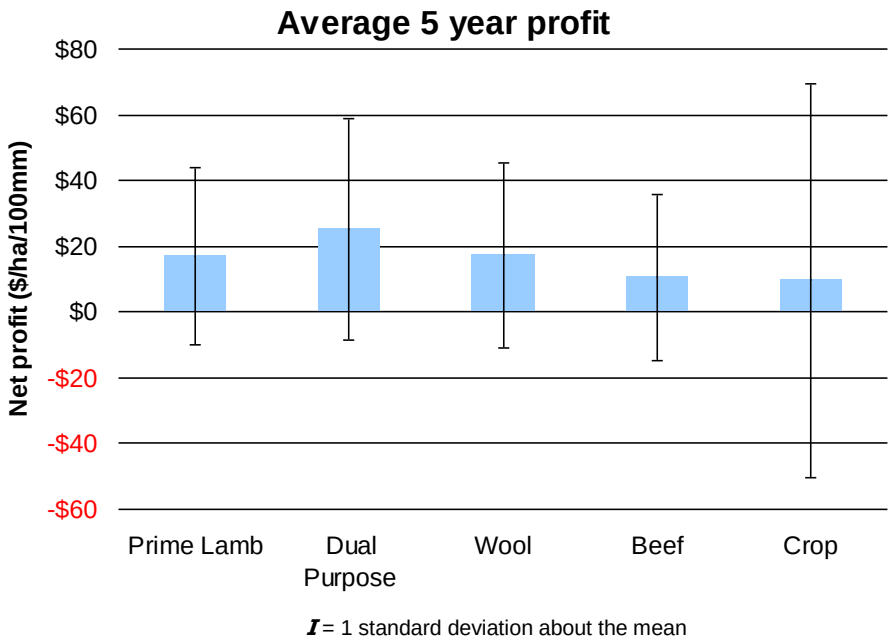


Figure 6: Unprecedented sheep and wool profits have provided superior returns to beef.

Source: Holmes Sackett Pty Ltd Benchmarking Database 1998 to 2012

The change in ranking of enterprise profitability as a consequence of the last five years shows how susceptible each enterprise is to the cyclical nature of commodity prices and seasonal conditions. Merino wool was the most lamented industry five years ago. When consideration is given to the fact that the dual purpose enterprises are an opportunistic way for wool enterprises to value add to their enterprise, then wool has risen to be the most profitable specialist enterprise over the last five years.

The benchmarking data over 15 years (Figure 5) shows that over a long period of time the decision regarding which enterprise to manage cannot be made on relative profitability between enterprises. The extent of the variation within each enterprise (both because of the variation in performance of different producers and because of the highs and lows in each commodity cycle) is far greater than the extent of the variation between enterprises.

Variation in profits

Over a fifteen year time frame, dryland cropping has by far the largest variation in profits per hectare per 100mm of rainfall (Figure 5). This is represented by the error bars depicting one standard deviation of variation from the mean in Figure 5.

The most variable enterprise after dryland cropping was prime lamb, followed by dual purpose, wool and then beef. The differences in variation between livestock enterprises are negligible compared to the variation between livestock enterprises and cropping. Whilst this data confirms that the variation in cropping profits is higher than livestock enterprises the average profits are not dissimilar.

Cropping businesses need to be able to cope with the variation through management of debt levels to ensure that they have access to working capital over a number of years if the seasons and prices conspire against them in the short term. Dryland cropping farms that maintain a strong enough balance sheet to handle the variation in profits will be just as profitable in the long term.

The same rules apply to all of the livestock enterprises. Prudent debt management, rather than avoiding debt, is a key success factor in farm business management.

Long term profits by geographical zone

The profits in three different geographical zones have been analysed. These geographical zones (Figure 7) 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). These zones are similar to the Pastoral zone, Wheat-sheep zone and High rainfall zones used in farm surveys by ABARES (Figure 8).

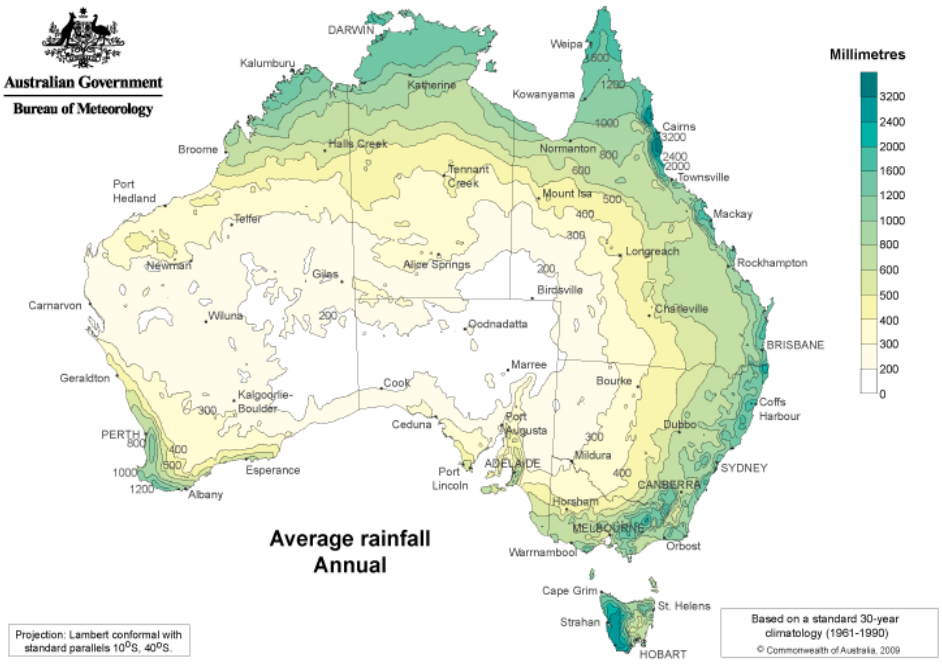


Figure 7: Rainfall zones of Australia

Source: Australian Bureau of Meteorology

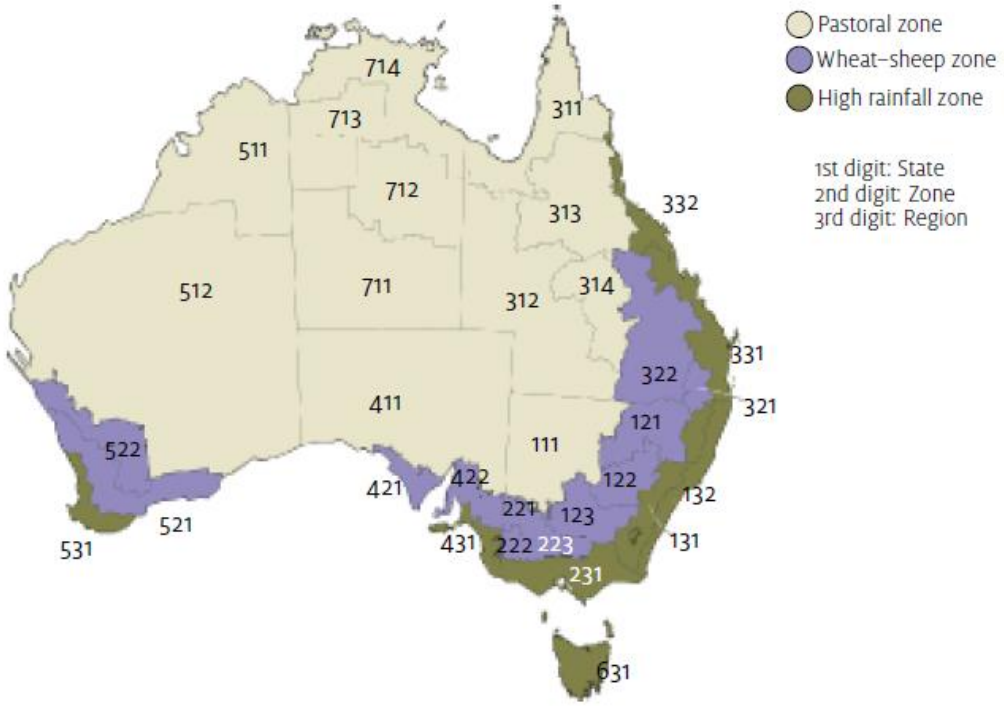


Figure 8: ABARES Australian broadacre zones and regions

Source: ABARES Farm survey results

Figure 9 shows the comparisons of net profit per hectare per 100 millimetres of year-analysed rainfall of each enterprise by geographical zone over a fifteen year period from 1998 to 2012. Comparing profit per hectare per 100 millimetres of rainfall accounts for variation in rainfall between enterprises in the data set.

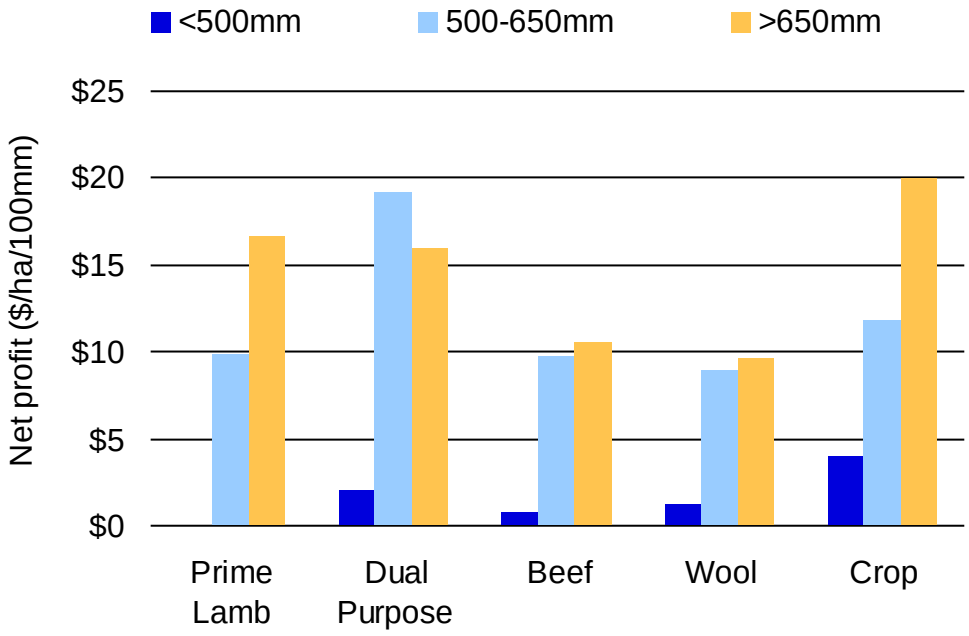


Figure 9 Comparative 15 year average net profit of enterprises across geographic zones.

Low rainfall zone

In the low rainfall zone the best performing enterprise has been cropping followed by dual purpose sheep enterprises, wool then beef. Prime lamb is omitted from this analysis as there is insufficient data in the first decade of this fifteen year analysis to draw a meaningful comparison.

Medium rainfall zone

In the medium rainfall zone the only enterprise that stands out as being substantially different from all other enterprises is the dual purpose sheep enterprise. The dual purpose sheep enterprise consists mainly of merino ewes joined to terminal or maternal sires and they are most often run alongside a self-replacing merino flock. It therefore refers to a dual purpose system rather than a dual purpose breed.

The three factors that have contributed to a near doubling of profits of this enterprise relative to other livestock enterprises include unprecedented sheep meat prices, low cost genetics sourced from merino flocks and high wool prices.

Aside from dual purpose enterprises there was little difference in profit per hectare per 100 mm of rainfall amongst the other enterprises.

High rainfall zone

In the high rainfall zone cropping has been the most profitable enterprise followed by prime lamb, dual purpose, beef and with wool as the least profitable enterprise.

Cropping has performed particularly well in the high rainfall zone over this period in part because high rainfall cropping is a minor contributor to total grain production. In the most severe drought years the higher rainfall areas harvested reasonable crop yields at record grain prices due to decimated supply. This lead to exceptionally high per hectare returns in the high rainfall zone. Technology advances leading to the ability to crop previously unarable land in the high rainfall zone have led to cropping being a serious competitor to livestock enterprises for land use in this zone.

Shorter term (5 year) profits by geographical zone

Low rainfall zone

In low rainfall areas meat production enterprises have a competitive disadvantage relative to other enterprises due to the shorter growing season. This has been expressed over the last five year period where beef and prime lamb enterprises have lagged relative to dual purpose sheep enterprises, wool and cropping (Figure 10).

In essence the dual purpose system reflects a store lamb system in these areas where reduced sheep meat income is offset by additional wool income. This is not something that the specialist prime lamb enterprise offers as wool income from these breeds is low.

Cropping has been substantially more profitable over this period in the low rainfall zone but that result is due to one good year in five (the 2010 harvest). In that year the returns from both wheat and canola were particularly good in this rainfall zone.

Rainfall was far higher than average in all rainfall zones in 2010. The low rainfall zone escaped harvest rain with an earlier harvest relative to the other zones and this, combined with decile 7 to 8 prices, led to solid returns.

Medium rainfall zone

In the medium rainfall zone over the last five years beef has been the worst performing enterprise. Dual purpose and wool have been the most profitable enterprises. Prime lamb was the next most profitable enterprise followed closely by cropping.

Beef and cropping were the two least profitable enterprises in the medium rainfall zone. This is not the result of falling profitability of these enterprises. It is rather that the price driven profit increases seen in the wool and sheep meat enterprises have not been matched in these enterprises.

Five year average wool profits have been weighted heavily by the very high wool prices during 2011 and 2012. Dual purpose sheep enterprises took advantage of high wool and lamb prices.

High rainfall zone

In the high rainfall zone over the last five years beef is again the least profitable of all enterprises. Prime lamb profits exceed dual purpose sheep in this zone followed by wool and cropping profits. The competitive advantage of prime lamb seen in the long term data in the high rainfall zone is maintained in the shorter term. This has not been the case for beef as prices have not increased at the same rate as sheep meat prices.

With the exception of the 2010 harvest, dryland cropping in the high rainfall zone has not had the luxury of high prices. The last few years with higher than average rainfall have been disastrous in much of the high rainfall zone for cropping. Waterlogging has suppressed yield during these years and rain at harvest lowered price as well.

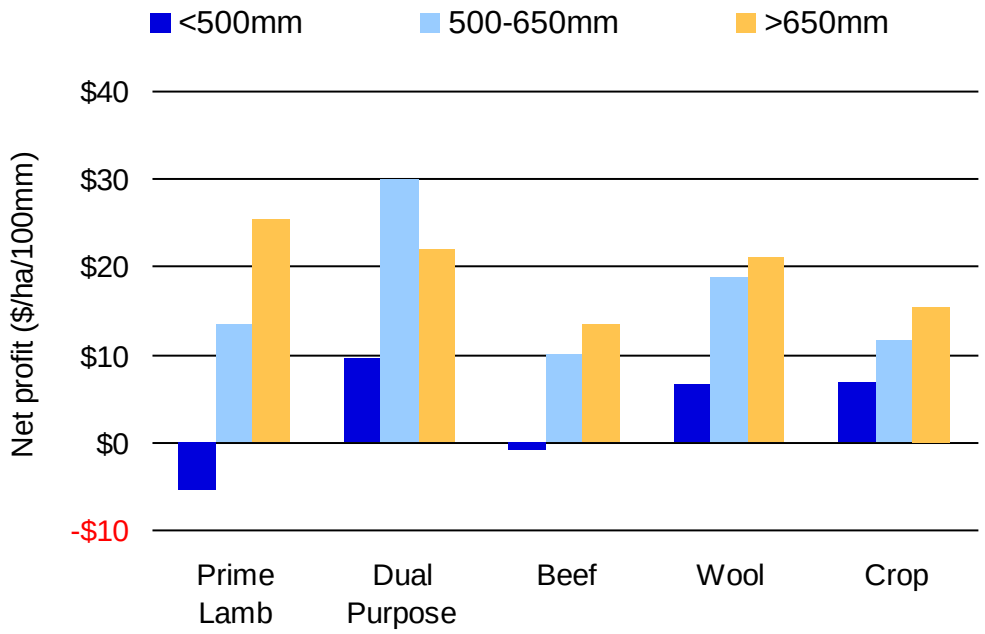


Figure 10 Average net profit per hectare per 100 mm of annual rainfall (nominal) for wool flocks, beef herds, dual purpose and prime lamb flocks, wheat and canola crops 2008-2012.

3.2 Differences in return on assets

Comparison of returns on assets under management are not explicit from the benchmarking methodology because land use is not determined by fixed geographic boundaries and therefore comparative land values between land used for different enterprises is not available.

It is common on properties that have multiple enterprises for enterprises to use different land classes across the property. For example, cropping is allocated the most arable land while merino wethers are allocated land with the least productive capacity.

To calculate an estimate of comparative profitability between enterprises, an average land value for mixed farms with 600 mm of rainfall has been allocated. All enterprises are assumed to be managed on land with the same productive capacity. Land in the 600 millimetre rainfall zone was chosen because it is suitable for all enterprise purposes including crop.

As rainfall increases above 800 mm and decreases below 450 mm land has historically been less attractive for cropping enterprises. This is due to rainfall variability, temperature, waterlogging and frost. The exception is in southern areas with rainfall less than 450 mm. In this zone reliability of rainfall seasonality improves.

Increasingly, cropping is expanding in high rainfall zones. Technology has improved the probability of success in this zone with improved agronomy, genetics and drainage being key. Additionally,

management techniques specific to this zone have improved profits. Still, few crop enterprises are managed at 800 mm of rainfall and above.

The average land value recorded for farms in this rainfall is $3,800 per hectare. There is a wide range in land value at this level of rainfall from $1,500 to $5,000 per hectare reflecting different regions and land classes. The actual value chosen does not impact on the conclusions drawn from this analysis because it is analysing the comparative profitability, under the assumption that the same land is used for all enterprises.

Land is not the only resource utilised in any enterprise. The range in the value of other assets relative to land can be large. For the purpose of this analysis, other assets required for management of the enterprise are livestock, plant and equipment and working capital. The estimates of livestock values per hectare have been calculated by multiplying the expected average annual stocking rate for the rainfall zone by a standard valuation per dry sheep equivalent (DSE). Beef cattle and crossbred ewes for prime lamb production have traditionally had greater values relative to merino ewes.

The stocking rate per hectare, expressed as average annual DSE managed per hectare, varies by enterprise according to that which would be achieved with commonly run production systems.

The value of plant and equipment per hectare is taken from the average benchmarked values per hectare for crops and livestock.

Working capital for livestock enterprises has been calculated by adding direct and overhead expenses expressed in dollars per DSE for each livestock enterprise and multiplying by the average annual stocking rate. Working capital for crop enterprises has been calculated by adding the direct and overhead expenses per hectare.

Table 3: Comparison of the estimated return on assets under management between enterprises based on their 15 year average profits per hectare per 100mm of rainfall.

	Wool	**Beef**	**Prime Lamb**	**Dual Purpose**	**Crop**
Rainfall (mm)	600	600	600	600	600
Mid-winter stocking rate (DSE/ha)	9.8	9.8	9.8	9.8	
Average annual stocking rate (DSE/ha)	11.76	11.76	10.78	10.78	
Land value ($/ha)	$3,800	$3,800	$3,800	$3,800	$3,800
Livestock capital ($/ha)	$588	$823	$755	$647	$0
Working capital ($/ha)	$412	$259	$345	$377	$556
Plant and equipment ($/ha)	$100	$100	$100	$100	$235
Assets under management ($/ha)	$4,900	$4,982	$5,000	$4,924	$4,591
15yr Average net profit ($/ha/100mm)	$18.78	$10.01	$13.20	$29.83	$11.54
Average profit ($/ha)	$113	$60	$79	$179	$69
Return on assets under management	2.3%	1.2%	1.6%	3.7%	1.4%

This analysis shows that merino based enterprises (wool and dual purpose) have produced a higher return on assets under management than cropping, beef or prime lamb. This is the opposite finding to the situation analysis in 2008 where cropping was found to have performed better over the previous 11 years. The change is because profits from merino wool based enterprises have been extremely good in the past few years as a consequence of wool and sheep prices being very high by historical standards.

For the ranking to switch so quickly suggests that the answer as to which will be the enterprise with the highest return on assets will always be dependent on when the question is asked relative to the position in the cycle for each commodity in question.

The analysis does not suggest the better than average profits in any enterprise cannot be competitive with average profits of any other enterprise.

3.3 Enterprise characteristics , historical performance and variation

Beef is unique among common broadacre enterprises in Australia. It 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. Beef herd performance referred to in the following sections of this report is derived from analysis of self-replacing herds only.

Figure 11 shows the average net profit per hectare per 100 mm of annual rainfall by year over the 15 year period from 1998 to 2012. The expression of profit per hectares per 100 mm of rainfall accounts for variation in rainfall between beef enterprises in the data set.

The historical average over this period (15 years) is represented by the horizontal light blue line and equates to $9.26 per hectare per 100 mm of rainfall. The average has been exceeded in 9 of the last 15 years with the remaining 6 years generating returns below the long term average.

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. Analysis suggests that management can account for a large proportion of the variation in profit. Other broad acre livestock enterprises experience similar levels of within-year profit variation.

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 under-estimates 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.

Beef enterprise profits in 2012 were second only to those achieved in 2002. Profits of the last three years have mimicked profits generated during the period from 2000 to 2002. Profits of the last three years have exceeded long term average profits and represent favourable returns for beef enterprises.

The years with negative to nil profit (1998, 2003, 2007 and 2008) demonstrate the impact of the four major widespread droughts of the last 15 years on beef enterprises. Sixty five percent of profits were made in the years 2001, 2002, 2005, 2011 and 2012 (33% of years). While making the most of good years is imperative to long-term profitability, so is minimising the impact of bad years when they occur. Further information on how that might be achieved is included in the last section of this report.

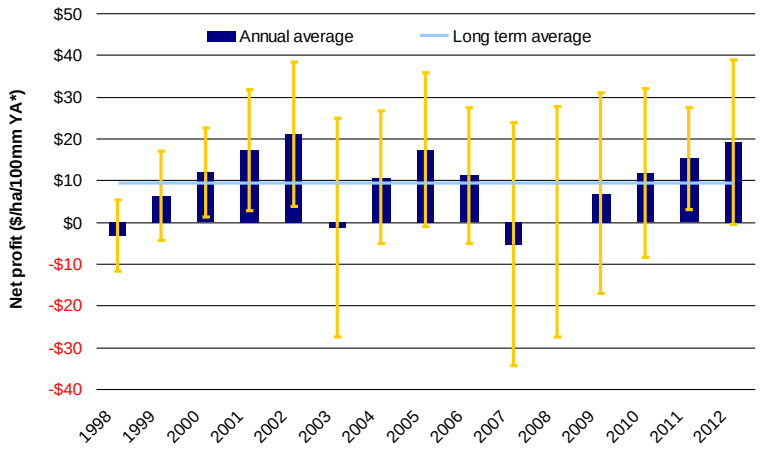


Figure 11: Annual average net profit for beef enterprises per hectare per 100mm for beef.

**$/ha/100mmYA – Dollars per hectare per 100mm of year analysed rainfall*

Source: Holmes Sackett Pty Ltd Benchmarking Database 1998 to 2012

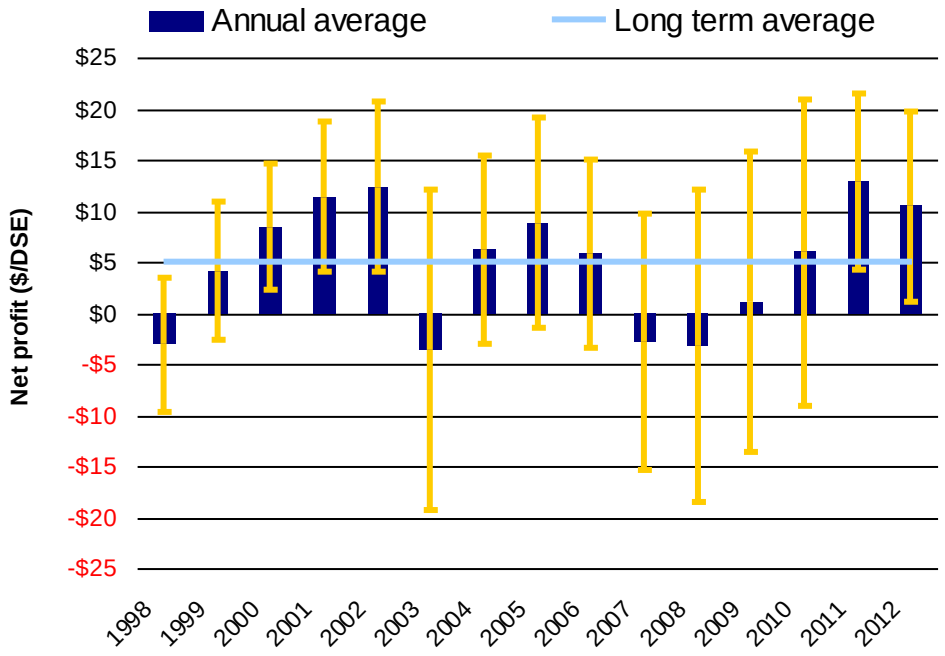


Figure 12: The year to year variation in per DSE profits is similar to profits per hectare per 100mm of rainfall

Figure 12 shows long term profits of beef enterprises expressed in dollars per DSE. The trend is similar to profit per hectare per 100mm of rainfall with the highs and lows occurring in similar years. Over the long term the average net profit of beef enterprises is approximately $5 per DSE.

The vast majority of beef production enterprises rely on pasture and specialist crops for their production systems. There are no specialist feedlot systems represented. Within the herds represented, the target markets range from store weaner production through to the production of heavy bullocks. It is not possible to provide a detailed analysis of the main enterprise structure and environment combinations; however the market environment and the principles that separate the more profitable enterprises from the average will be discussed.

3.4 Current beef enterprise performance – average and top 20%

Table 4 shows income, expenditure, production and other performance measures of beef enterprises for 2012 expressed in dollars per dry sheep equivalent (DSE). The measures for the average and the top 20% within the year are shown.

Table 4: Performance of average and top 20% beef producing enterprises in 2012.

Data	Average	Top 20%
Income ($/DSE)	$32.62	$38.38
Enterprise expenses ($/DSE)	$6.59	$6.34
Gross margin ($/DSE)	$26.03	$32.04
Overheads ($/DSE)	$15.60	$12.83
Net profit ($/DSE)	$10.43	$19.22

Average annual stocking rate (DSE/ha)	11.0	17.2
Cost Production/Kg Beef	$1.19	$0.93
Av Annual SR DSE/Ha/100mm YA	1.6	2.6
Price Received/Kg Beef	$1.88	$1.92
Gross /Head Sold	$812	$884
Kg Beef/Ha/100mm rain	31.5	54.3
Mid-Winter Stocking Rate (DSE/Ha)	8.8	14.2
Kg Beef/DSE	19.3	20.8
Kg Beef/Head Sold	432	460
DSE/Labour Unit	13,873	18,585
Enterprise Size (Annual Ave DSE's)	12,393	15,007
Net Profit/Ha/100mm (Ya)	$19.20	$49.51

Source: Holmes Sackett Pty Ltd Benchmarking Database 2012

The average represent all data points collected for the 2012 year while the top 20% represents those producers who were ranked in the top 20% based on net profit per hectare per 100 mm of year analysed rainfall.

The magnitude of the difference in profit of the top 20% relative to the average is approximately $9 per DSE. Approximately $6 of this is a result of improved income while the remainder is in lower costs. The majority of the lower costs occurs at the overhead cost level.

The metrics that differentiate the top 20% from the average include:

- higher stocking rate
- higher production per DSE and per hectare
- higher production per head sold
- lower cost of production
- higher labour efficiency.

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

The features of the most profitable beef enterprises seen in 2012 are the same features that are observed over the longer term and across geographic zones. This is demonstrated in Table 5 which shows the difference in top 20% and average beef enterprise performance across different rainfall zones. Rankings are conducted on net profit per hectare per 100 millimetres of rainfall.

Table 5 Key performance indicators of Southern Australian beef enterprises for three rainfall zones

Rainfall zone	<500mm	500-650mm		>650mm	
Ranked on NP/ha/100mm Last 10 years	Average	Average	Top 20%	Average	Top 20%
Income ($/DSE)	$27.48	$30.12	$35.24	$27.92	$33.70
Enterprise expenses ($/DSE)	$11.84	$7.36	$5.92	$6.73	$5.46
Gross margin ($/DSE)	$15.32	$22.76	$29.32	$21.19	$28.24
Overhead expenses ($/DSE)	$18.83	$16.23	$14.53	$15.91	$13.63
Net profit ($/DSE)	-$3.43	$6.53	$14.80	$5.28	$14.60
Net profit ($/ha/100mm)	-$0.81	$11.46	$31.53	$12.33	$38.18
Cost of production ($/kg beef lwt)	$1.90	$1.32	$1.05	$1.26	$0.90
Price received ($/kg beef lwt)	$1.52	$1.71	$1.77	$1.60	$1.64
Income ($/head sold	$628	$700.73	$769.13	$704.28	$759.43
Production (kg beef/ha)	45.2	$176	$237	$286	$384
Production (kg beef/ha/100mm)	11.6	32.3	45.8	39.9	56.7
Stocking rate mid-winter (DSE/ha)	2.3	9.6	11.2	12.6	15.2
Production (kg beef/DSE)	20.0	18.6	20.6	18.5	21.0
Production (kg beef/head sold)	365	407.3	434.5	440.1	463.6
Labour efficiency (DSE/labour unit)	10,823	10146	11944	10369	12745
Enterprise size (Average annual DSE)	9,951	11,447	8,028	8,799	9,358
Stocking rate average annual (DSE/ha)	2.4	10	12	15	18
SR DSE/ha/100mm	0.5	1.7	2.3	2.1	2.7

Data for the 500-650 millimetre and >650 millimetre rainfall zones shown in Table 5 has been generated by analysing the benchmarking results of only those participants who have contributed in at least 5 of the last 10 years. There is insufficient data in the <500 millimetre zone to analyse separately thus only the average of all participants has been listed in that zone. The top 20% refers to the average of those performers who were above the 80th percentile ranking for profit per hectare per 100 mm rainfall. The average is calculated by adding all data points for each specific key performance indicator and dividing by the number of data sets.

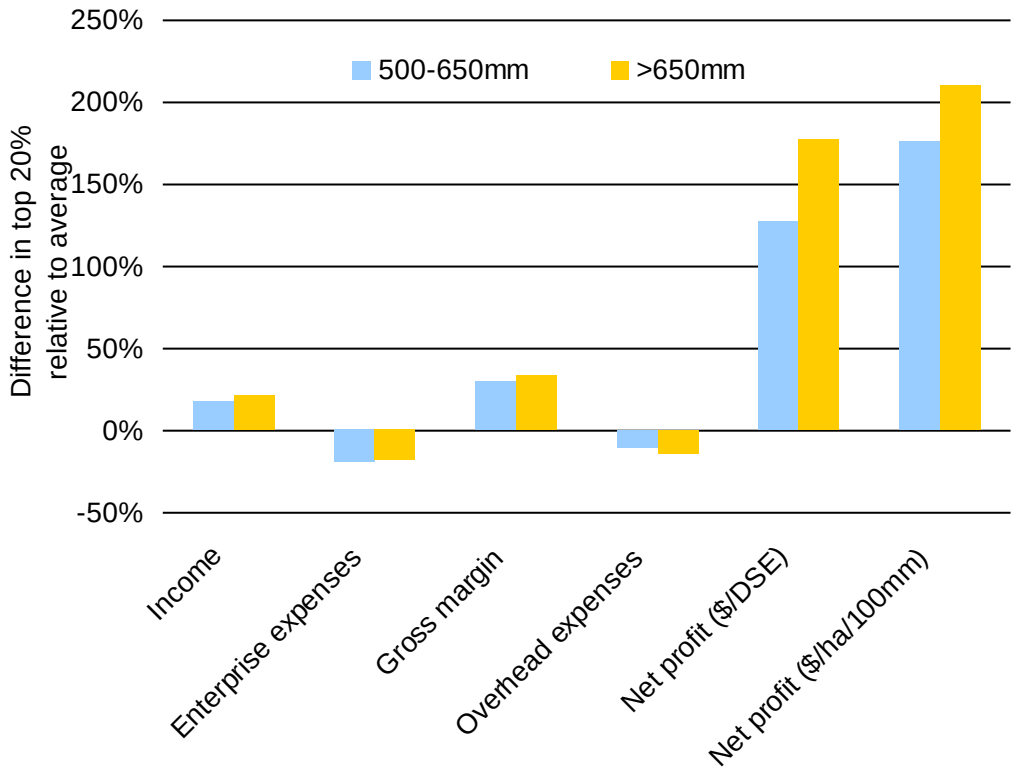


Figure 13 Small changes in income and expenses lead to large changes in profit

Figure 13 shows the deviation in a range of financial indicators, 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. This Figure demonstrates that relatively small changes, in percentage terms, in income and expenses lead to very large differences in profit.

The differences in income are driven by superior production per DSE while the variation in enterprise expenses is mainly a due to a difference in supplementary feed costs. The lower overhead expenditure is a function of a higher stocking rate of the top 20% relative to the average which spreads costs over more productive units.

The increased net profit per hectare per 100 mm of rainfall demonstrates that stocking rate is a key driver of improved per hectare performance of the top 20% relative to the average.

Figure 14 is derived from the data in Table 5 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 figure follow:

1. Price received varies in only a minor way thus it is not a key driver of any difference in profit.
2. Average annual and mid-winter stocking rate are on average between 15 and 20% higher

3. Production per DSE, per head and per hectare are all higher with per hectare being higher by the greatest magnitude.
4. Labour efficiency is approximately 20% higher driving lower overhead costs.
5. Cost of production is between 20 and 30% lower due to better matching of feed supply with feed demand, greater production and lower per DSE costs.

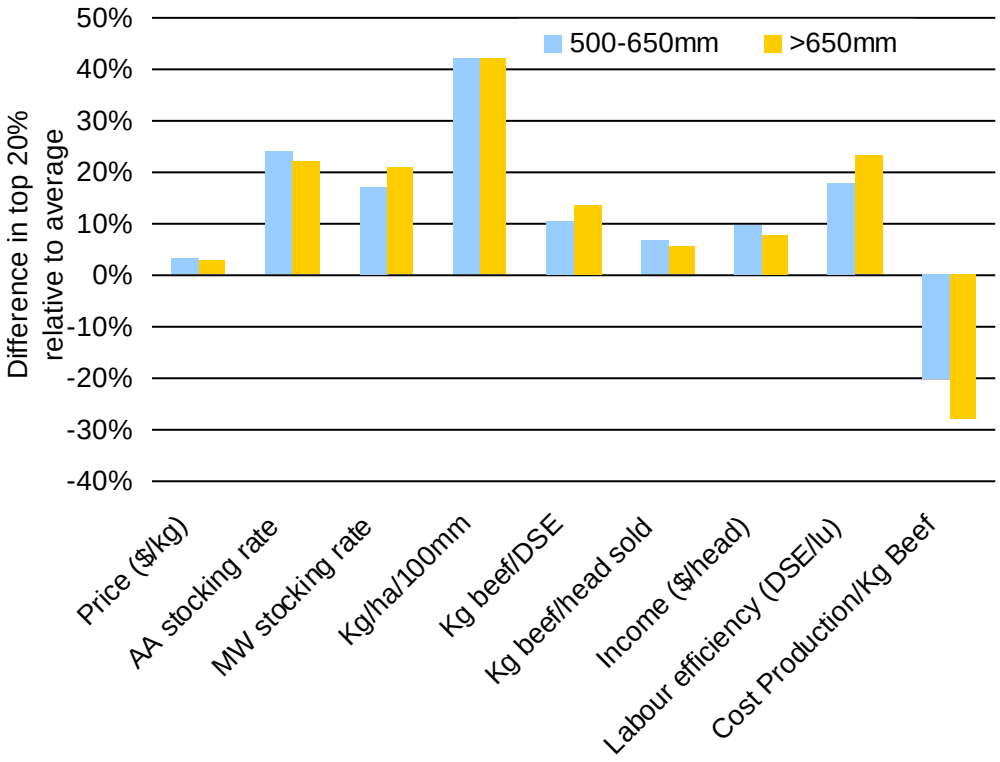


Figure 14: The features of the most profitable beef producers does not differ between the medium and high rainfall zones

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. That is, efficient systems and higher stocking rates which lead to better feed utilisation.
- 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 only minor difference in profit per DSE and per hectare per 100 millimetres of rainfall. There is however a large difference in profit between the less than 500 millimetre zone and the other zones. This is partly due to the frequency of drought and the severity when it occurs, and partly due to shorter growing seasons. This is demonstrated in Figure 15. This is a slightly different data set to that shown in Table 5 as it includes all participants across each rainfall zone. Figure 15 shows the annual average profit per hectare per 100 mm of rainfall for all beef benchmarking participants by rainfall zone.

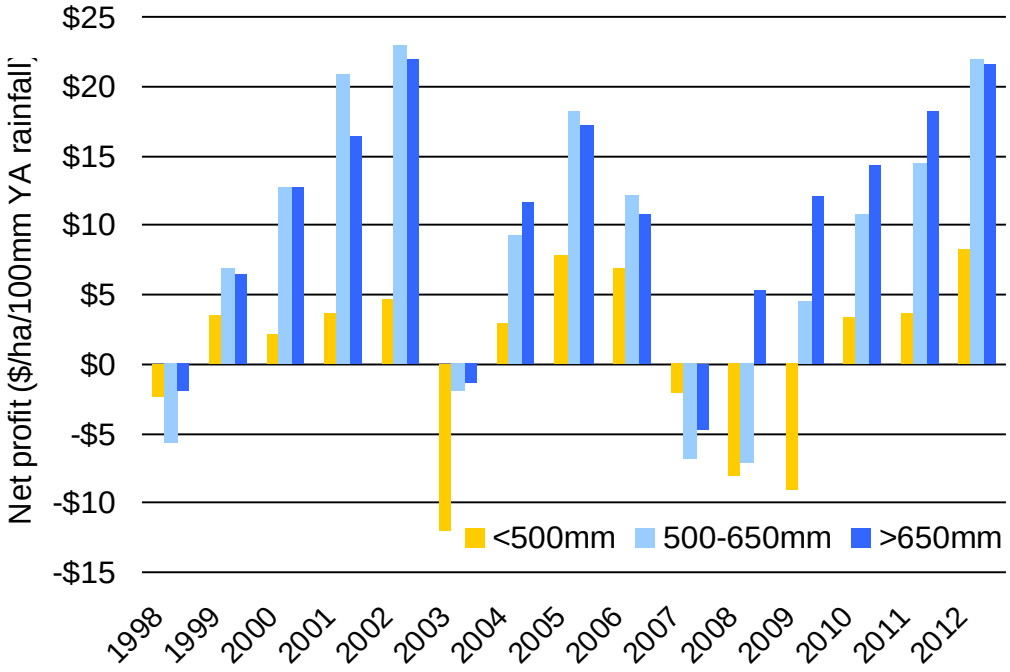


Figure 15: The low rainfall zone has experienced greater losses and less upside when compared to the medium and high rainfall zone.

In the low rainfall zone losses were incurred in five of the last 15 years. In the medium and high rainfall zones losses were incurred in only four and three years respectively. On average, beef producers in the low rainfall zone have not experienced profits per hectare per 100mm of rainfall greater than $8. This compares to a maximum of over $20 for both the medium and high rainfall zones. For all zones 2012 represents close to the highest level of profit on average. This represents an increase of between $10 and $15 per hectare per 100mm when compared with results of the situation analysis ending 2009.

The key factors that influence higher production and lower cost of production include choice of target markets, genetics, calving time and selling times. System profitability is also dependent on price received. In a commodity production business such as beef there is little influence over price received except by targeting specific markets or weight categories. Cost of production and price interact in any beef

production system in a complex way. This means all of these factors must be considered rather than just one when assessing profitability.

The top 20% group does not achieve the highest level of profitability as a function of a combination of superior productivity, cost of production and price. They produce more kilograms of beef per hectare at a lower cost of production but sell at a similar price to the average.

Production is a particularly important component of the difference in profit between average and top 20% beef producers. The reason for this is that it is influenced by management and it has a large impact on cost of production.

Top 20% producers achieve higher levels of production per hectare (adjusted for rainfall) by producing more kilograms of beef for each DSE managed (kg beef/DSE) and by managing more DSE per hectare after adjusting for rainfall received (avg. ann. stocking rate/ ha/100mm). In all grazing enterprises, production is driven primarily by:

- Stocking rate per hectare,
- Optimum herd weaning weight per hectare, and,
- The average weight and age of animals at sale and its impact on herd structure.

These issues are addressed later in this report under the title “Keys to profitable production”.

It is the combination of these that contributes to kilograms of beef produced per hectare. All of these things are influenced by rainfall, soil fertility, pastures, genetics, choice of calving date, and target sale date to meet the chosen market. There are always compromises between these individual components.

Optimum stocking rates have a positive impact on total beef produced per hectare. Optimum production occurs where stocking rate is optimised not the point at which individual animal performance is maximised. Optimum stocking rates can lead to lower individual animal performance. This is usually an acceptable trade-off for improved per hectare performance.

At optimum stocking rates the cost structure will also be at optimum. As productivity is increased beyond the optimum stocking rate, every additional kilogram has a higher cost than it has value. This is why identification of the optimum stocking rate in a beef enterprise is important. The key issue for every producer is to identify those cost-effective opportunities.

One of the possible reasons for the average stocking rates practiced by industry to be lower than optimum levels is the perceived level of risk which occurs in adverse seasonal conditions. The assumption is that higher stocking rates increase the severity and susceptibility of the farm to drought and this decreases profit due to lower production and higher supplementary feeding cost. The risk management strategy employed in response to this perceived risk is to run lower stocking rates in

average and above average years, largely set around conservative stocking rates established during average years.

Previous analysis has found that tactical management, rather than running sub-optimal stocking rate, is the key to improved profits of the top 20% relative to the average during drought. Analysis has shown that top performers have higher stocking rates leading up to a drought period but lower stocking rates during drought. One conclusion that could be drawn from this is that the top 20% act early to make de-stocking decisions, thereby selling before prices plummet, or they are more adept at using decision tools to make decisions. These tools include whole farm feed budgeting and animal intake tools, soil moisture profiles and rainfall decile tools.

The key message is that managing stocking rates to suit the seasonal conditions requires good tactical management in good and adverse seasonal conditions. Stocking rates should be adjusted to be higher in the good seasons and lower in the poor seasons rather than running lower stocking rates at all times in anticipation of adverse seasonal conditions. Running trading cattle alongside a core beef breeding enterprise can help to prioritise livestock sales during drought. The most profitable beef producers are, however, also prepared to sell breeding cattle, regardless of the stage of reproductive cycle, if necessary.

3.6 Impact of current and future prices for beef

Table 6 shows commodity prices for the current analysis year (2012) relative to historical prices over the last 10 years. Also shown is the 2012 average cost of production. Beef prices for steers were around the 90th percentile while for cows they were in the 60th percentile. The majority of the beef produced in southern systems comes from these two livestock classes. The 2012 cost of production is sitting between the lowest and the 10th percentile.

The story is similar for wool but not so for lamb. This suggests that wool and beef producers who have faced median to low percentile pricing for a large proportion of the last 15 years have learnt how to reduce the cost of production. The same cannot be said for lamb where cost of production currently sits at the median pricing level.

This indicates that beef producers are currently well positioned to withstand price decreases and maintain reasonable margins on every kilogram of production. Should price increases be seen then beef producer profits may be greater than those seen in the sheep industry over the last few years.

This differs to the outcome of the 2009 beef situation analysis. The average cost of production of beef producers at that stage was at the median level thus pricing at that level led to zero margins.

Table 6: Price percentiles (1998 to 2012) and 2012 prices for common broadacre commodities

Percentile	Wool 19 micron c/kg clean	Lamb c/kg dwt	Steers c/kg lwt	Cows c/kg lwt	Wheat $/tonne	Canola $/tonne
100%	1772	690	223	178	490	800
90%	1424	514	207	156	335	609
80%	1281	482	198	152	283	568
70%	1146	452	191	149	270	543
60%	1085	413	187	145	247	510
50%	1044	382	181	140	229	474
40%	1005	357	176	137	201	424
30%	963	344	171	134	192	406
20%	936	331	166	131	174	369
10%	908	307	157	125	160	338
0%	774	181	123	95	129	270
2012 Price	1444	468	204	147	208	530
2012 CoP	838	370	120	120	212	530

= nearest percentile to 2012 price

Source: Independent commodity services

4 Keys to profitable beef production – beyond 2012

4.1 Directions to improve herd profits

Production level per hectare of the top 20%, and the overall average, for beef enterprises over the past 15 years (1998 to 2012) is shown in Figure 16 as kilograms of beef liveweight per hectare. This is comprised of long term data from participants who have benchmarked in five of the last ten years.

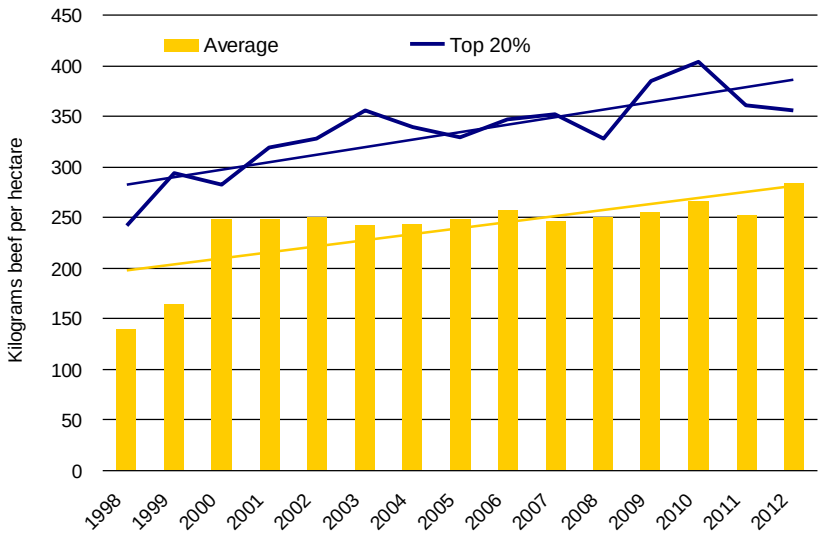


Figure 16: Production per hectare is a key driver of the difference between the best and average beef producers.

Source: Holmes Sackett Pty Ltd Benchmarking Database 1998-2012

The trend is a rate of growth in production (kilograms beef per hectare) of approximately 2.5% per annum The types of technologies that deliver the production gains achieved include the implementation of systems that best match time of calving to feed supply and time of turnoff to declining feed quality. Managing optimum stocking rates is usually the other key production gain having the greatest impact at the profit level. Key to this is the implementation of tactical drought management which requires a solid understanding of feed supply and demand and the use of the range of tools that support quick and effective decisions. These included feed budgeting, soil moisture, pasture growth and rainfall tools.

Figure 17 shows nominal beef cost of production and price received for the Holmes Sackett benchmarking database from 1998 until 2012. The trend lines show that cost of production has been increasing at a similar rate to price received. Cost of production has been increasing at a rate of just over 3% per annum while the rate of increase is just under 3% for price received.

There are five years when cost of production exceeded price received. The 2012 year shows that the margin between cost of production and price received was superseded only by the margin in 2002. These years demonstrate the need for commodity beef businesses to maintain a low cost of production.

The key factor that has led to the lower cost of production experienced over the last 3 to 4 years relative to the rate of increase shown in the trend line is an improvement in seasons. Rainfall exceeded the long term average by 15% from 2010 to 2012 while the preceding three years experienced rainfall 15% lower than the long term average. This has led to a relative increase in production of 7% over the last 3 years when compared to the preceding years. This, coupled with a reduction in supplementary feed costs of 60%, has largely led to the lower cost of production over this period.

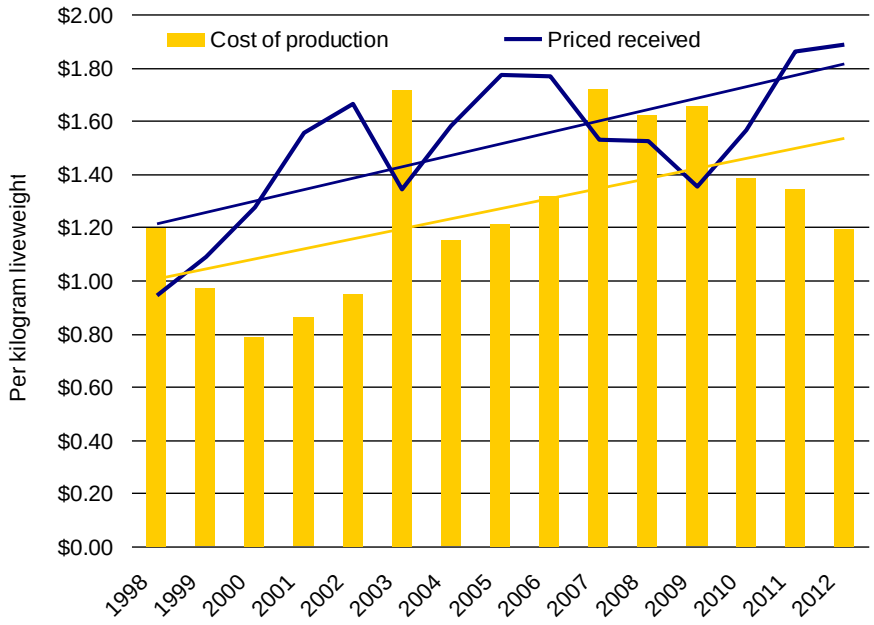


Figure 17: Beef cost of production, price received and trends over time (nominal)

Source: Holmes Sackett Pty Ltd Benchmarking Database 1998-2012

4.2 Changing cost of production

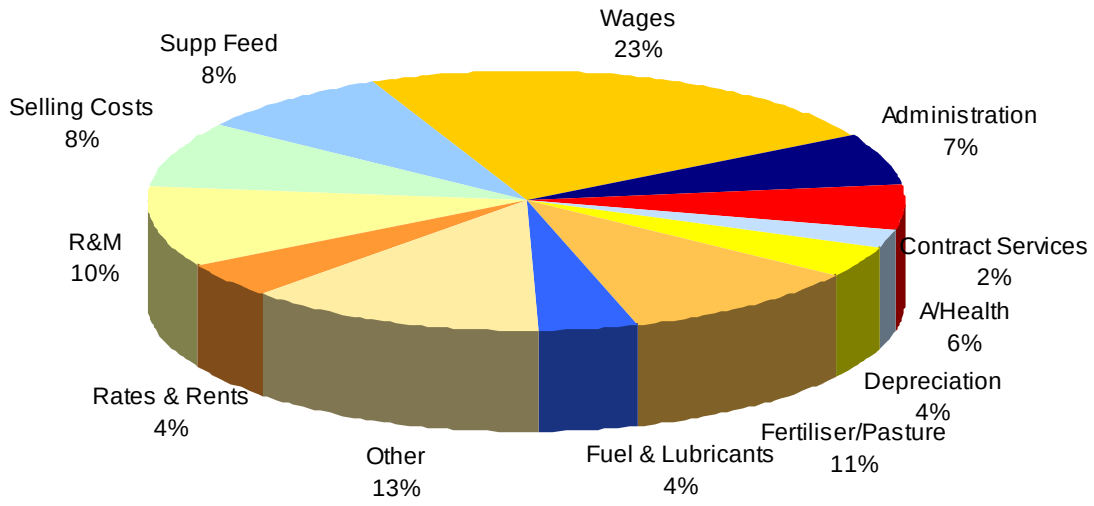
Cost of production is a ratio. It is calculated by dividing the total cost of producing each kilogram of beef by the number of kilograms produced. For example, a herd that produces 100,000 kilograms liveweight of beef for a total cost of $150,000 has a cost of production of $1.50 per kilogram liveweight.

$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.

It is necessary to understand the components of expenditure when looking to improve cost of production. Figure 18 shows the components of the cost of producing a kilogram of beef.



Source: Holmes Sackett Pty Ltd (2009-2012)

Figure 18: Average components by percentage of total beef production costs

One of the areas with the greatest potential for reducing production costs in the business is labour efficiency. Labour and labour related expenses account for approximately 40% of total expenditure. Thus these should be a high priority. On many farms it will be possible to reduce labour costs by increasing labour efficiency at no additional cost to production.

Feed related expenditure including fertiliser and supplementary feeding is the next highest cost area. Careful analysis is required before taking action regarding these costs. In the 500 millimetre plus rainfall zone, production can be dependent on investment in fertiliser and supplementary feed thus lowering the cost of production will not necessarily come from reductions in these costs.

One of the questions currently being asked by those who have invested heavily in fertiliser over the last decade is whether it is more cost effective to run high soil phosphorus levels down or maintain them at a level that may now be above optimum. A further question is why they have increased above optimum when maintenance levels have been applied and can lower rates be applied at higher soil phosphorus levels to maintain those high levels. These are areas where further research and development are required.

Figure 19 shows the difference in fertiliser expenses per DSE between the top 20% and the average of those participants who have benchmarked for 5 of the last 10 years. The data suggest that the top 20% spend more than the average in the majority of years but they appear also to reduce fertiliser costs post drought when carryover fertility from lower stocking rates is likely.

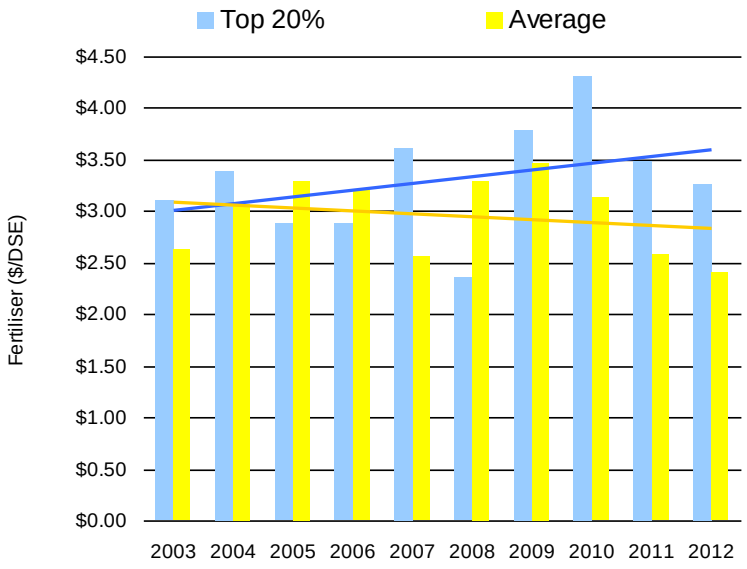


Figure 19: The top 20% spend more on fertiliser in most years

Supplementary feeding is another cost area requiring judicious decision making. That is, cost reduction in those situations where feeding for no marginal benefit is achieved, makes economic sense. Where the marginal benefit is higher than the marginal cost of feeding it makes no economic sense to reduce supplementary feeding cost. The outcome of feeding decisions can be driven by a range of factors such as beef and supplementary feed prices, thus decisions will differ between businesses. Some of the tools available to assist beef producers with supplementary feeding decisions include whole farm feed budgeting tools, pasture assessment tools and the computer program GrazFeed.

4.3 Increase production

If cost reduction has been considered and actions taken to address the issues identified, the other potential way of lowering cost of production is by increasing production without a commensurate increase in costs. Any increase in production costs should only be accommodated where the value of productivity gains derived from additional inputs exceeds their costs.

4.4 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 which generally comes at lower cost than fodder crops or supplementary feed. The place to start is to 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 completed.

After an optimum level of utilisation has been achieved, 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.

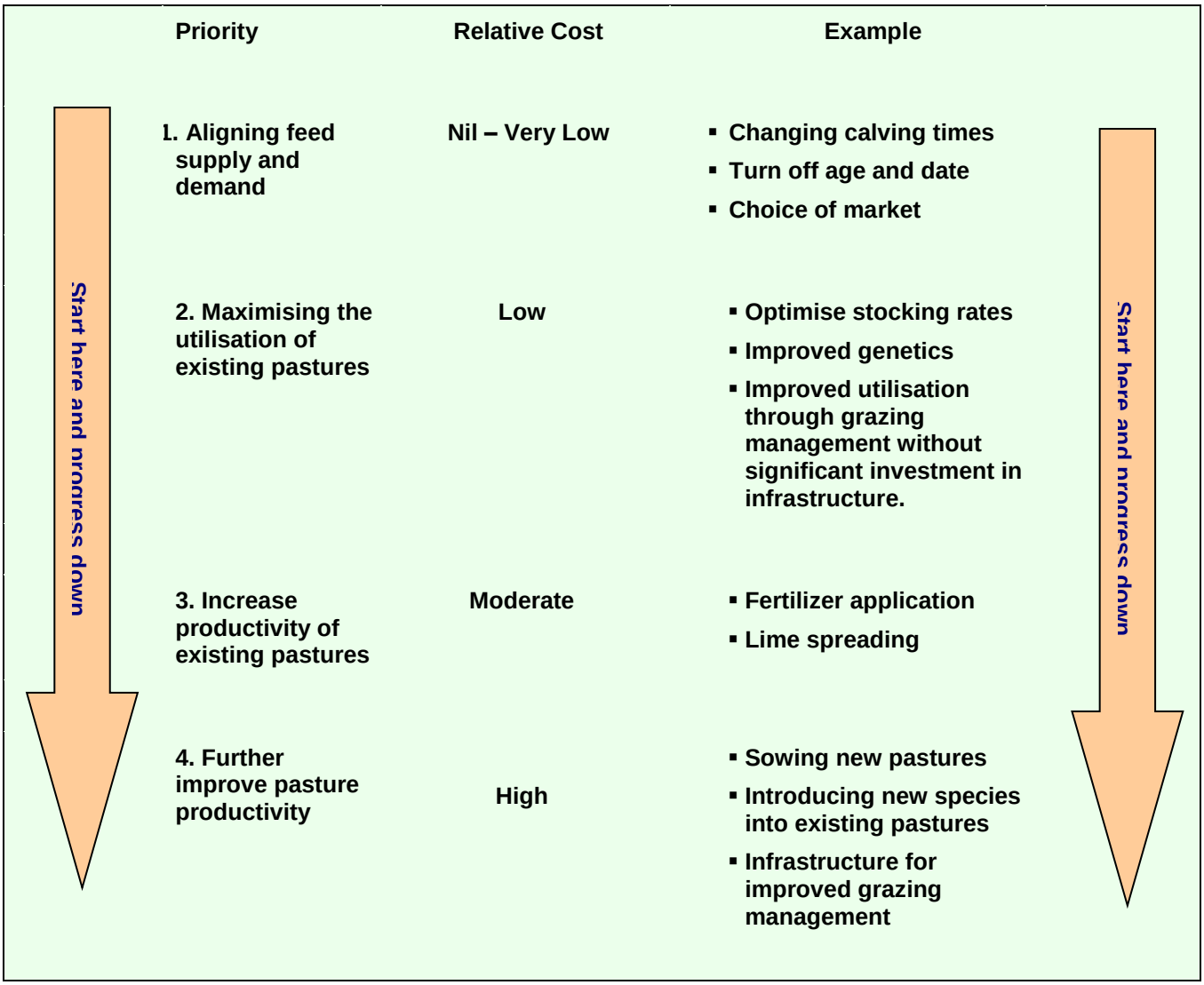


Figure 20: Suggested program for improved productivity

4.5 Per head or per hectare

One of the key changes required for focussing on cost of production and associated profitability is to move from thinking about per-head returns to per-hectare returns. Given that the majority of the investment in beef enterprises is in the land associated with the growing of the beef it makes sense to look to generate the highest return on the largest component of the investment. Per-head measures that are commonly used include price per head and sale weight per head.

It has been demonstrated earlier in this report that the more profitable beef producers produce more kilograms of beef per hectare than the average producer and at a lower cost per kilogram. The driving principles relating to how this is done are outlined in Figure 21.

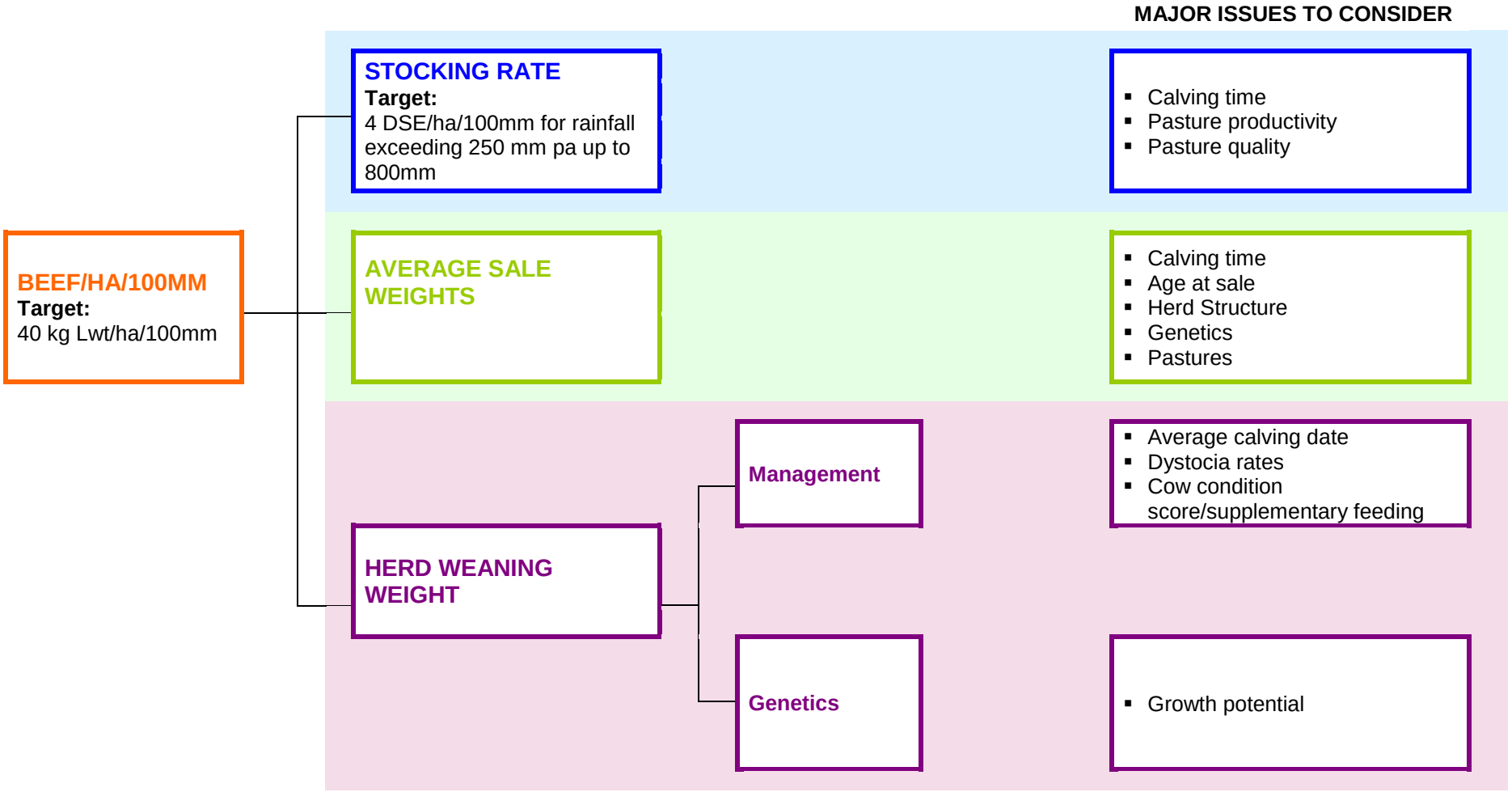


Figure 21: **The most important factors that influence per hectare production of beef are stocking rate and average sale weight**

A suggested target productivity for efficient beef production is 40 kilograms liveweight per hectare per 100 millimetres of rainfall. The three key influences of this productivity target are:

Stocking rate

In winter-dominant rainfall regions, a useful rule of thumb is the French Schultz model which suggests an optimum stocking rate of 4DSE/ha/100mm above 250mm for improved pastures. This model provides a guide for those regions in the range of 400mm and 800mm rainfall.

For those regions that fall outside these rainfall conditions, producers should look for local benchmarks above the district average. It is stressed that these are generic targets and they need to be tailored to individual farms. Some farms with poor quality soils and low quality land classes will be constrained by environmental parameters well before they reach these stocking rate targets. It is also important that these stocking rate targets are long-term targets, it is no good meeting them in one year at the expense of longer-term productivity.

Determining long-term optimum stocking rates that meet profit and environmental objectives is a difficult decision for those involved in livestock production, but it is too important not to get it right. A more difficult process than determining optimum stocking rate is actually (a) achieving and (b) maintaining it at levels suitable within the constraints of season. Decisions on when to destock and/or feed animals through poor seasonal conditions *early* enough for action/s to be beneficial can be complex. This is an area where further research and development investment may yield improvements in the accuracy and application of decision-support tools and information.

Increasing stocking rates will have major interactions with sale liveweight and herd fertility because individual animal performance will be suboptimal where per hectare performance is optimised.

To help manage these negative impacts on individual animal performance, it is necessary to pay attention to calving time and seasonality of pasture production. Choice of calving time will determine how closely cow requirements are matched to pasture availability. At higher stocking rates, there will also be a requirement for pastures that are able to persist and provide adequate ground cover in autumn, which will be a function of grazing management, species selection and soil fertility.

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.

The more profitable herds sell a greater percentage of heavier classes of animals, and therefore the average weight of all the animals sold is heavier.

Optimum herd weaning weight per hectare

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 remain self-replacing, there is most often a surplus of females in calf in southern beef systems.

The main issue in southern beef herds is the number of cows run per hectare and the weight of calves weaned per cow run after pregnancy testing; this encompasses average calving date and dystocia rates. The more calves born alive and earlier in the calving span, the higher the herd weaning weight due to a greater number of average growing days for the calves.

Genetics will influence herd weaning weight but the occasional direct correlations between genetics and dystocia rates are limiting the adoption of growth in genetics. Another useful genetic aid in commercial herds is hybrid vigour. Crossbreeding systems have been demonstrated to have the potential to increase weaning weights by up to 23%. This is not well understood within the industry.

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. Research has shown that a condition score of 2.5 to 3 should be targeted for cows at calving for optimum productivity.

Beef producers seem less focussed on using condition scoring as a tool for decision making relative to sheep producers. A condition scoring tool for cattle, as has been produced for sheep, will 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.

4.6 Increasing business efficiency

Some farm businesses aim to improve low levels of labour efficiency and high overhead cost structures by purchasing or leasing additional land. That is – getting bigger. While this may present opportunity to create wealth it may do little to improve business efficiency.

Contrary to popular belief, there are alternatives to expansion of the land area to improve business efficiency. Where labour efficiency is low and there is insufficient scale to support a full time labour unit it makes sense to use the surplus labour off-farm. This requires a paradigm shift as the farm is often seen as owing families a living. Small farms can be profitable but only where the cost structure is matched to the operating scale. This may mean spending more time working off farm than on it.

Economies of scale are generated where a decrease in the marginal cost of production occurs as production increases. This suggests that additional production from the existing area, provided it results in a lower marginal cost of production, will lead to economies of scale.

This is possible in the vast majority of beef businesses by improving pasture utilisation or pasture production, or both, and managing the most efficient beef production system to harvest the pasture. The advantage of this approach is that it tends to be relatively low cost compared to expansion through land acquisition. In many cases it also generates the greatest return on investment. The implication is that there is more to be gained by getting better at beef production than getting a bigger area to produce on.

4.7 Capital appreciation

A common mistake in the analysis of farm business viability is to ignore the return from capital appreciation. Over the last fifteen years, capital appreciation on land has produced approximately two thirds of total farm business returns. Capital gains can result in a seemingly unviable business (those generating no net operating profit) actually being viable depending on the definition. This is why very few farm businesses are forced to leave the land.

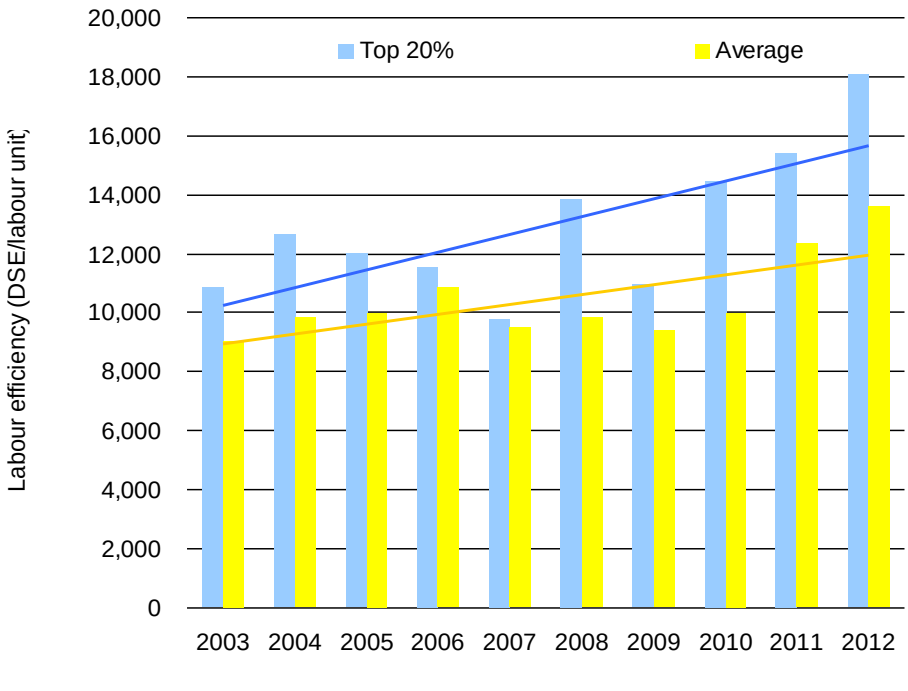
4.8 Labour

Labour and labour-related expenses represent approximately 40% of the total cost of a beef business. Labour related expenses include all of the additional costs associated with labour including motor vehicle expenses, fuel and lubricants and depreciation. Given the extent of these costs labour expenses represent a great opportunity for improving efficiency.

Labour efficiency is measured in DSE per labour unit and is a measure of time of all of the labour associated with managing and operating a beef herd. A labour unit is considered as 240 days per year accounting for weekends and holidays.

Labour efficiency is improving at an impressive rate in beef enterprises (Figure 22). Of those beef producers who have benchmarked for 5 or more of the last 10 years, the top 20% have increased labour efficiency by 4.5% per annum while the average have increased labour efficiency by 3.1% per annum. In 2008 there were 14.8% and 6.5% of beef producers exceeding 15,000 and 20,000 DSE per labour unit respectively. In 2012 this has more than doubled to 34% and 16%. This suggests that target levels should exceed 20,000 DSE per labour unit which is an increase of 5,000 DSE per labour unit on recommendations of the 2009 report.

Infrastructure quality (labour saving, throughput and automation aspects) and the production systems employed are major drivers of labour efficiency. Experience suggests that repairs and maintenance of infrastructure such as watering points and fencing can consume a large amount of labour in beef enterprises. Investment in better stock proofing these can lead to significant improvements in labour efficiency.



\

Figure 22: Growth of labour efficiency in beef enterprises has been impressive

Source Holmes Sackett Pty Ltd Benchmarking Database

4.9 Genetics

Genetics used in the production system refers to breed selection and selection of animals within a particular breed or breeds.

In the case of breed selection, the only consideration that needs to be made is to ensure that the breeds that are chosen do not jeopardise market access. An example is some domestic and long-fed export markets where a limit on *Bos indicus* or European content can be applied.

Likewise, there are widely acknowledged benefits to be gained by efficient use of cross breeding to capture hybrid vigour. The advantages of various crossbreeding programs are well documented. Often though, these programs are discarded due to the complexity involved in some systems. Simple systems that may only capture some of the potential hybrid vigour benefits of crossbreeding are effective in increasing productivity in herds with no changes to costs.

In terms of within-breed genetic selection, numerous research and extension programs have highlighted the potential impact that the selection of better genetics can have on herd productivity and profitability. The use of objective measurement, including Estimated Breeding Values (EBV) and the tools associated with their use, allows significant and targeted genetic gains to be achieved.

Importantly, the actual impacts of any genetic gain on the variation in herd productivity and profitability are often swamped by other key drivers; as a consequence, genetics in isolation can be much less important to producer profitability than other aspects of management. A genetically superior herd in an inefficient or poorly managed production system has no chance of making top 20% profits, whereas a genetically average herd in a very efficient, well-managed production system will always make top 20% profits.

4.10 How resilient is the business to unfavourable seasonal conditions?

Beef enterprises experience a significant impact on per-hectare profitability during drought. Unlike wool production systems where wool prices do not change in response to drought, beef production and price tend to concurrently collapse in a drought. Lamb systems have similar dynamics to beef but specialist lamb production generally has less geographic spread, being predominantly confined to the high rainfall and sheep meat regions. This means lamb production systems are less exposed to the severity and incidence of drought.

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.

Rather, it is the planning processes before and during the drought that are critical. Put simply, those who were more profitable prior to the drought because of their increased productivity, also tended to be more profitable over the long term.

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. This appeared to be due to poor decisions or, worse still no decisions, being made during the drought. Tactical drought management is a critical skill that is necessary for running optimum stocking rates. Unless the use of the tools for decision making are understood, and there is an associated clear plan for decision making during dry times, then confidence in managing optimum stocking rates is eroded.

4.11 Key messages and opportunities

This situation analysis has highlighted that the majority of the beef industry is making production gains at low rates of incremental gain while the minority is making production gains at double the rate of the majority. This suggests that the production message is possibly being delivered ineffectively or a greater persuasive effort is required for buy in or implementation.

Labour productivity is an area where large gains have been made by both the average and the top 20% however the rate gain of the top 20% has again been higher than the average. While this is a good news story for beef, labour productivity remains an area where significant gains can still be made, particularly given the majority are still well below target levels. The targets have increased by 5,000 DSE per labour unit over five years.

Cost of production has declined since the last situation analysis but the longer term trend is for an increase over time. This is not surprising but the trend has been for prices, in nominal terms, to increase at a similar rate to the rate of increase in cost of production. Low relative beef pricing when compared with lamb may not be all bad assuming it is partly responsible for driving lower cost of production to current levels of $1.20 per kilogram of beef produced. Unlike lamb, where cost of production has increased at a far greater rate than beef over time, this places beef producers in a great situation to maintain reasonable margins into the future, even if beef prices were to fall.

The potential areas for improvement in productivity have not changed since the last situation analysis. The majority of beef producers are far from the upper limits of production suggesting that there are still plenty of low cost gains available. The key opportunities that will lead to improvements include:

- Improved systems through better alignment of feed supply with demand and taking feed quality into account;

- Improved understanding of fodder budgeting, tactical decision making tools and implementation of a drought plan
- Improved cost control. Better matching costs to production capabilities of the system;
- Productivity improvements in soils and pastures through better forecasting and decision support technologies;
- Optimising production, primarily through increasing stocking rate;
- Labour productivity through improved efficiency, investment in infrastructure and automation.

5 Appendix 1

Dry sheep equivalent to adult equivalent conversion tables

Dry sheep equivalent version

Table 1 Beef DSE ratings

Beef dry sheep equivalent (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
Lactating 0-3 months	15	3	3.8
Lactating 4-8 months	17	5	7.1
Total/average		12	13.8

Adult equivalent version

Table 1 Beef AE ratings

Beef adult equivalent (AE) ratings		
	Adult equivalents	
Weaned calves	200kg	250kg
Weaned calves gaining 0.25kg/day	0.57	0.71
Weaned calves gaining 0.75kg/day	1.00	1.14
Yearlings	300kg	350kg
Yearlings gaining 0.25kg/day	0.86	1.00
Yearlings gaining 0.75kg/day	1.29	1.43
Mature cattle	400kg	500kg
Dry cows, steers (maintenance)	0.86	1.00
Dry cows, steers gaining 0.25kg/day	1.00	1.29
Bullocks gaining 0.75kg/day	1.57	1.86
Pregnant cows (last 3 months)	1.14	1.29
Cows with calves (0-3 months)	1.86	2.14
Cows with calves (4-6 months)	2.29	2.43

Beef cow (500 kilogram per head) DSE ratings			
Status	AE/hd	Time (mths)	Total AE
Pregnant, last 4 months	1.3	4	0.4
Lactating 0-3 months	2.1	3	0.5
Lactating 4-8 months	2.4	5	1.0
Total/average		12	2.0

Dry sheep equivalent version

Table 5 Key performance indicators of Southern Australian beef enterprises for three rainfall zones

Rainfall zone	<500mm	500-650mm		>650mm	
Ranked on NP/ha/100mm Last 10 years	Average	Average	Top 20%	Average	Top 20%
Income ($/DSE)	$27.48	$30.12	$35.24	$27.92	$33.70
Enterprise expenses ($/DSE)	$11.84	$7.36	$5.92	$6.73	$5.46
Gross margin ($/DSE)	$15.32	$22.76	$29.32	$21.19	$28.24
Overhead expenses ($/DSE)	$18.83	$16.23	$14.53	$15.91	$13.63
Net profit ($/DSE)	-$3.43	$6.53	$14.80	$5.28	$14.60
Net profit ($/ha/100mm)	-$0.81	$11.46	$31.53	$12.33	$38.18
Cost of production ($/kg beef lwt)	$1.90	$1.32	$1.05	$1.26	$0.90
Price received ($/kg beef lwt)	$1.52	$1.71	$1.77	$1.60	$1.64
Income ($/head sold)	$628	$700.73	$769.13	$704.28	$759.43
Production (kg beef/ha)	45.2	$176	$237	$286	$384
Production (kg beef/ha/100mm)	11.6	32.3	45.8	39.9	56.7
Stocking rate mid winter (DSE/ha)	2.3	9.6	11.2	12.6	15.2
Production (kg beef/DSE)	20.0	18.6	20.6	18.5	21.0
Production (kg beef/head sold)	365	407.3	434.5	440.1	463.6
Labour efficiency (DSE/labour unit)	10,823	10146	11944	10369	12745
Enterprise size (Average annual DSE)	9,951	11,447	8,028	8,799	9,358
Stocking rate average annual (DSE/ha)	2.4	10	12	15	18
Stocking rate (DSE/ha/100mm)	0.5	1.7	2.3	2.1	2.7

Adult equivalent version

Table 5 Key performance indicators of Southern Australian beef enterprises for three rainfall zones

Rainfall zone	<500mm	500-650mm		>650mm	
Ranked on NP/ha/100mm Last 10 years	Average	Average	Top 20%	Average	Top 20%
Income ($/AE)	$192.34	$210.86	$246.71	$195.47	$235.91
Enterprise expenses ($/AE)	$82.91	$51.50	$41.44	$47.13	$38.25
Gross margin ($/AE)	$107.25	$159.35	$205.27	$148.34	$197.66
Overhead expenses ($/AE)	$131.84	$113.62	$101.70	$111.39	$95.43
Net profit ($/AE)	-$24.01	$45.74	$103.57	$36.95	$102.23
Net profit ($/ha/100mm)	-$0.81	$11.46	$31.53	$12.33	$38.18
Cost of production ($/kg beef lwt)	$1.90	$1.32	$1.05	$1.26	$0.90
Price received ($/kg beef lwt)	$1.52	$1.71	$1.77	$1.60	$1.64
Income ($/head sold)	$628	$700.73	$769.13	$704.28	$759.43
Production (kg beef/ha)	45.2	$176	$237	$286	$384
Production (kg beef/ha/100mm)	11.6	32.3	45.8	39.9	56.7
Stocking rate mid winter (AE/ha)	0.3	1.4	1.6	1.8	2.2
Production (kg beef/AE)	140.1	130.3	143.9	129.8	147.1
Production (kg beef/head sold)	365	407.3	434.5	440.1	463.6
Labour efficiency (AE/labour unit)	1,546	1449	1706	1481	1821
Enterprise size (Average annual AE)	1,422	1,635	1,147	1,257	1,337
Stocking rate average annual (AE/ha)	0.3	1.4	1.7	2.1	2.6
Stocking rate (AE/ha/100mm)	0.1	0.2	0.3	0.3	0.4

Dry sheep equivalent version

Table 4 : Performance of average and top 20% beef producing enterprises in 2012.

Data	**Average**	**Top 20%**
Income ($/DSE)	$32.62	$38.38
Enterprise expenses ($/DSE)	$6.59	$6.34
Gross margin ($/DSE)	$26.03	$32.04
Overheads ($/DSE)	$15.60	$12.83
Net profit ($/DSE)	$10.43	$19.22
Average annual stocking rate (DSE/ha)	11	17.2
Cost of production ($kg beef lwt)	$1.19	$0.93
Av annual stocking rate (DSE/Ha/100mm YA)	1.6	2.6
Price received ($/kg beef lwt)	$1.88	$1.92
Income ($/head sold)	$812	$884
Production (kg beef/ha/100mm)	31.5	54.3
Stocking rate mid winter (DSE/Ha)	8.8	14.2
Production (kg beef/DSE)	19.3	20.8
Production (kg beef/head sold)	432	460
Labour efficiency (DSE/labour unit)	13,873	18,585
Enterprise size (Average annual DSE)	12,393	15,007
Net profit ($/ha/100mm)	$19.20	$49.51

Adult equivalent version

Table 4 : Performance of average and top 20% beef producing enterprises in 2012.

Data	**Average**	**Top 20%**
Income ($/AE)	$228.34	$268.66
Enterprise expenses ($/AE)	$46.13	$44.38
Gross margin ($/AE)	$182.21	$224.28
Overheads ($/AE)	$109.20	$89.81
Net profit ($/AE)	$73.01	$134.54
Average annual stocking rate (AE/ha)	1.6	2.5
Cost of production ($kg beef lwt)	$1.19	$0.93
Av annual stocking rate (AE/Ha/100mm YA	0.23	0.37
Price received ($/kg beef lwt)	$1.88	$1.92
Income ($/head sold)	$812	$884
Production (kg beef/ha/100mm)	31.5	54.3
Stocking rate mid winter (AE/Ha)	1.257143	2.0286
Production (kg beef/AE)	135.1	145.6
Production (kg beef/head sold)	432	460
Labour efficiency (AE/labour unit)	1,982	2,655
Enterprise size (Average annual AE)	1,770	2,144
Net profit ($/ha/100mm)	$19.20	$49.51