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Keys to Profitable Lamb Production – 2005 and Beyond

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Executive Summary

- The returns from lamb production currently exceed most other alternative enterprises. These returns have been driven by high prices rather than productivity improvements on farm which makes future profitability vulnerable to any decline in prices. A move from the other enterprises into lamb production and consequent increase in supply is a major risk.

- Despite the differences in average profitability for enterprises, the differences in profitability between farms running the same enterprise are much larger than the differences between enterprises. This means there is considerable scope for individual producers to improve the performance of their own enterprise.

- The most profitable lamb enterprises have a combination of high per hectare production (adjusted for rainfall), a lower cost of production and a higher sale price.

- Wool income remains an important contributor (40%) to the overall income of dual purpose enterprises.

- Most lamb currently sells for a price that exceeds what it costs to produce. The cost curve for lamb production shows that the range in cost of production is from a low of $1.27/kg Dwt to a high of $3.28/kg Dwt.

- Improvements in profitability will be achieved by reducing the cost to produce a kilogram of lamb. For most lamb enterprises this will mean aiming to lift lamb production to 17kg Dwt/ha/100mm. More production will mean the fixed costs, which represent the largest proportion of costs in lamb production, will be spread over more kilograms of lamb. Reducing the cost of production for most farms is about improving productivity rather than trying to cut costs out of the business.

- Improvements in productivity should be done in a logical progression, starting with those changes that are cheap and provide large returns, eg manipulating lambing time and turnoff times in order to improve pasture utilisation. The next step is to grow more pasture and ensure it is utilised with more animals. Initially this should be done by improving soil fertility and then sowing new pastures when soil fertility improves.

- The one area where farms have scope to reduce costs is labour. A large proportion of enterprises use much more than the target of 5,000 ewes per labour unit. Small enterprises can still achieve good labour efficiency.

- The lack of scale is a major impediment to the profitability of many small flocks. This is more likely to occur in businesses with less than $3-4 million invested in total assets. In cases where scale is a constraint, the priority is to improve productivity within the existing business before looking at options of expanding with additional land area through either leasing or purchasing.

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Introduction

Lamb prices are currently very good and have been so for the last few years. As a result lamb production is one of the most profitable livestock enterprises. This presents both an opportunity and a threat for the lamb industry. The opportunity comes from healthy cashflows and a general feeling of optimism in the industry. Consequently, producers have the confidence and means to invest in their business to further improve its productivity as well as to make it more resilient for the next seasonal or price downturn.

The threat comes from two quite different areas. The first is that periods of good profitability will attract new entrants from alternative enterprises as well as expansion of existing lamb producing enterprises. This will inevitably result in an increased supply of lamb. That increased supply then becomes a threat to continued high prices if it exceeds growth in demand.

The second threat is that good returns often lead to complacency. Most enterprises are currently making money even if they are not well run. There is not the urgency to implement change which in turn will result in improved returns in the future. For those who do invest, profitability boosts can be large while prices are good. In the longer term, the business is made more efficient and is more prepared when the next tough time comes along.

Current profitability is built largely on the extremely good prices over the last few years plus the longer term achievements of producing a product that better meets the market. However, price is largely outside the control of the producer and therefore current profitability is very vulnerable to any fall in prices in coming years.

Prices may fall for any number of reasons, many of which are outside the direct influence of the industry. These include impacts of the Australian dollar, reductions in demand due to economic conditions of customer countries or lost market share to cheaper and/or better quality products. A significant catalyst for falling prices however will be increased supply.

Australian lamb producers can adopt a number of strategies in the face of this problem. The first is to take the price opportunity while it lasts, enjoy reasonable profitability, and then accept falling prices when they occur. The second is to take the profits while they last and not worry about striving for high profitability then shift to the next opportunity when it arises. The third option is to strive for excellence in profitability now so that even when prices do fall they are enjoying profitability above the levels of other enterprises without having to worry about switching enterprises.

This paper discusses the current profitability of lamb enterprises, and the profitability differences of farms that are currently operating a lamb enterprise. It then looks at the questions managers need to ask if they want to choose to strive for excellence in profitability now.

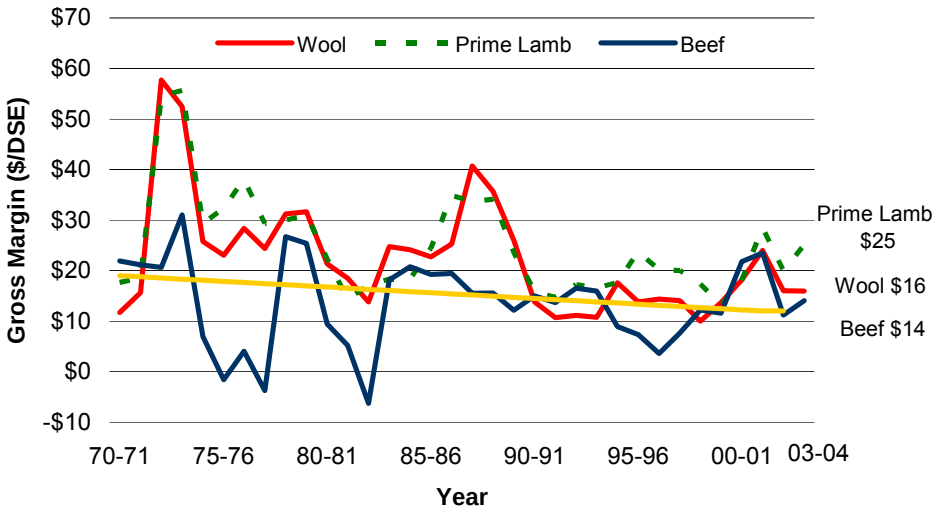
1 Current Situation - 2005

1.1 Relative Profitability

Lamb enterprises are currently enjoying a period of superior profitability compared to wool and beef but this has not always been the case. *Graph 1* shows that over a period of 30 years the fortunes of the industries have varied dramatically and that none are currently at their peak.

The data in *Graph 1* is taken from the Monitor Farm Project run by the Department of Primary Industries in Victoria and provides the best long term data on the relative profitability of the three industries. The data is in real terms meaning that the figures have been adjusted for inflation over this period. That is, a dollar in 1970-71 would buy the same amount of lamb in 2003/04. Prime lamb enterprises for this analysis include specialist lamb enterprises as well as dual purpose enterprises. Elsewhere in the document these two enterprises are often treated separately.

Graph 1: Lamb is currently profitable but over the last thirty years fortunes have varied dramatically

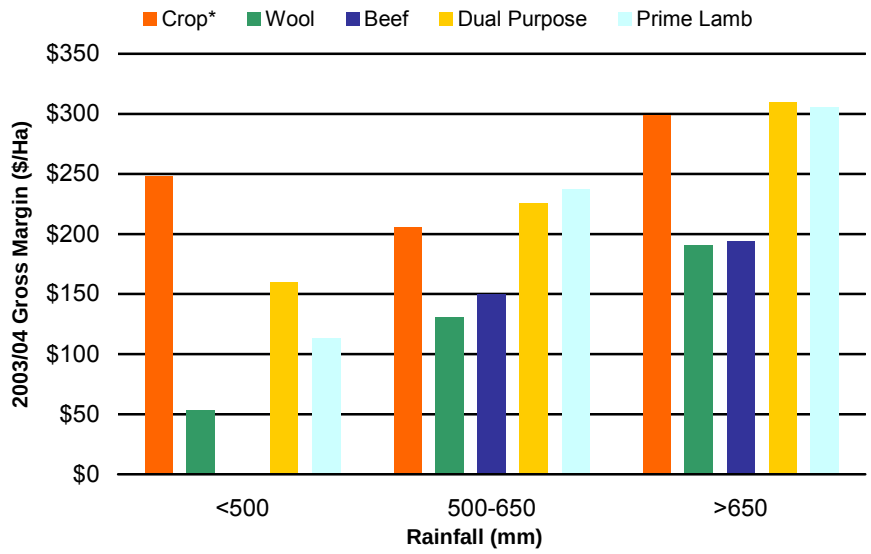


Source: Farm Monitor Project 2003/2004

This graph provides a good perspective on where the specialist prime lamb and dual purpose enterprises are situated now in both current and historical terms. Right now these industries are enjoying gross margins that are $10 per DSE higher than either beef or wool. However in real terms the gross margins are not at historical highs and neither is the gap between lamb and the other livestock enterprises higher than it has ever been. Throughout this 30 year period the beef and sheep enterprises have fluctuated independently of each other and wool and lamb production have jostled for superiority. In other words, specialist prime lamb enterprises and dual purpose flocks are experiencing good times not great times! The industry has been in this position before and based on the past variability one would be game to say that it will remain this way.

A comparison with crops in south east Australia is shown in *Graph 2*. Lamb enterprise returns have exceeded cropping in 2003/04 in the medium and higher rainfall cropping zones but not in the lower rainfall zone (<500mm). Remember that direct comparison using these figures can be limited because cropping on many farms is done on the most productive land classes whilst the stock are relegated to less productive country with a similar level of intensity. Returns from lamb production at current prices would exceed cropping on many farms.

Graph 2: Dual purpose and prime lamb outperformed cropping and other livestock enterprises in 2003/04 in the higher rainfall regions but not in the lower rainfall region

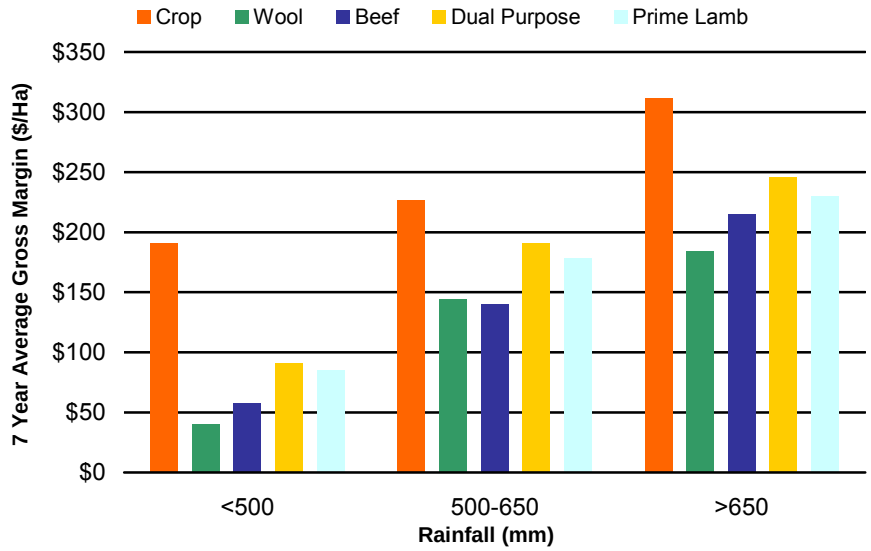


*Average of crops, particularly canola and wheat

Source: Holmes Sackett and Associates

Over the last seven years the picture has been different with cropping on average exceeding all the livestock enterprises (see *Graph 3*).

Graph 3: Cropping has provided the best long term per hectare returns compared to beef and wool with the advantage being greatest in the drier cropping areas



Source: Holmes Sackett & Associates

1.2 Enterprise Characteristics

Production systems for prime lamb are as varied as the range of climates in which it is produced. High sheep meat prices have resulted in significantly increased joining of ewes in the Australian flock to meat sheep breeds. Most of these ewes have been Merino, simply because they represent the greatest available resource, but dual purpose breeds such as the Corriedale or more recently introduced breeds such as Dohnes and SAMM's, and specialist meat sheep breeds such as Coopworth and the Border Leicester Merino crosses have been used.

For the remainder of this report we have classified the different production systems into two broad categories, being dual purpose and prime lamb. The reason for this difference in classification is that there is significantly less wool income in the specialist sheep meat breeds than those enterprises based on dual purpose and Merino ewes. *Graph 4* shows the three sources of income ($/DSE) from each system over the most recent year.

Graph 4: Sources of income wool, meat and sheep trading

Source: Holmes Sackett & Associates (2003/04)

Over the last five years and also in the latest year, dual purpose enterprises have outperformed the specialist meat sheep enterprises. Note that this does not mean that dual purpose breeds have out performed specialist sheep meat breeds as a large proportion of the enterprises in the dual purpose system are based on Merino ewes. The essential difference between the two enterprises is that whilst the dual purpose enterprises produce slightly less lamb income per year, they more than make up for this by producing more wool income.

Wool income is approximately 40% of dual purpose enterprises while lamb is 65%. In prime lamb enterprises wool is 25% and lamb is 80% (See *Graph 4*). Combined wool and lamb contribute roughly 105% of total income for the enterprise and the sheep trading income produces a 5% loss (eg. 40%+ 65% - 5%). In other words replacement ewes are a net cost to both enterprises.

Despite the fact that this paper is primarily about lamb production it is apparent that profitable lamb production is substantially influenced by the wool income. Wool is not simply a by product, a term that implies something that is just produced by accident in the process and is of no real significance. This means a discussion about profitable lamb production systems cannot ignore the fact that there are opportunities to boost returns by paying attention to the wool side of the equation. The top dual purpose enterprises do achieve good results from wool and lamb. The relative importance of wool will differ with changes in commodity prices, but as a reminder for those who have given up on wool it has contributed at least 27% of total income each year.

There is also a wide variety of production systems employed in lamb production. These are influenced by target market, enterprise mix and the environment in which the enterprises are run.

The two main factors to consider in any production system are the lambing time and the age and weight at which lambs are sold.

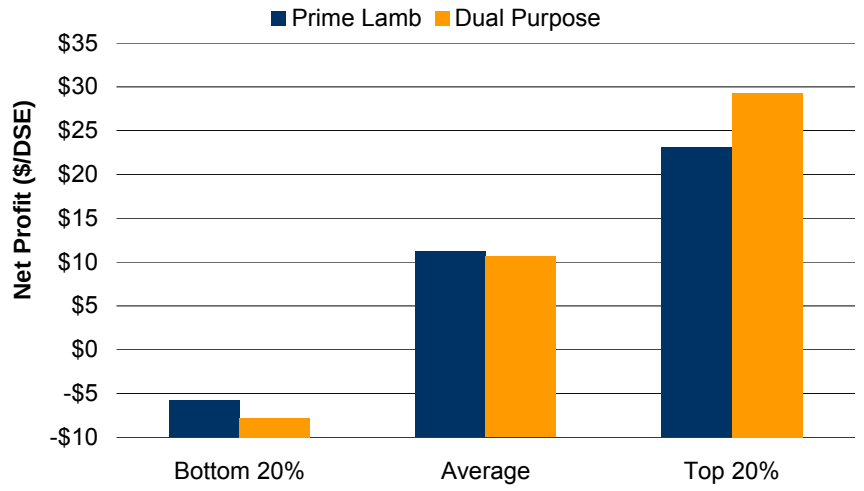
For instance a producer in the wheat sheep zone of NSW may choose to lamb in autumn and turn off 24kg export lambs in spring using a combination of stubbles, supplements, and grazing cereals. Another producer in Western Australia may choose to lamb in late winter and sell 18kg domestic weight lambs to the local supermarket trade. It is not within the bounds of this document to provide a detailed discussion of the main enterprise structure and environment combinations; however the market environment and the principals that separate the more profitable from the average will be discussed in some detail.

1.3 Variations in Profitability within each Enterprise

In just about every industry there is always more variation within an enterprise than there is between enterprises. Agriculture is no different. .

Graph 5 shows the variation in net profit per DSE within and between the two main lamb enterprises. Whilst there is at least a $10 difference between each of the three groups, there is only a couple of dollars between the two enterprises. **How well you run the enterprise is much more important than the decision whether to produce lamb from either a dual purpose flock or a specialist lamb flock.**

Graph 5: Differences in net profit within enterprises



Source: Holmes Sackett & Associates (2003/04)

The more profitable businesses within both groups have a superior combination of:

- Higher productivity (kg of lamb or wool per hectare),
- Lower cost of production (they produce each kilogram cheaper), and
- A higher price received.

The important word in the last sentence is 'combination'.

Table 1 shows the difference between the top 20% and the average enterprise for 2003/04.

Table 1: Key differences between average and top 20% lamb producing enterprises

	Prime Lamb		Dual Purpose	
	Average	**Top 20%**	**Average**	**Top 20%**
Profit ($/DSE)	$11.06	$23.07	$11.13	$29.26
Kg of Lamb Dwt (Per Ha/100mm)	14.0	17.2	11.8	15.7
Kg of Wool clean (Per Ha/100mm)	-	-	3.8	3.7
Cost of Production Lamb (Dwt)	$3.11	$1.85	$2.69	$1.88
Cost of Production Wool ($/kg clean)	-	-	$4.77	$3.29
Price Received Lamb ($/kg Dwt)	$4.01	$4.30	$4.19	$4.06
Price Received Wool ($/kg clean)	-	-	$7.58	$8.03

Source: AgInsights 2004, Holmes Sackett & Associates

The reality is that choice of market, genetics, when you lamb and when you sell, and all other inputs into the system are only a means to achieving a better combination of productivity, cost of production, and price than currently exists. The complexity of the interactions between these three things means that you cannot look at any one in isolation. These factors are discussed in greater detail in the next section.

The top prime lamb enterprises produced more kilograms of lamb per hectare with a lower cost of production and a higher sale price per kilogram. The wool component has been left out for prime lamb because it is such a small part of the overall income mix that it only has a minor impact on profitability.

The productivity component is particularly powerful for both prime lamb and dual purpose enterprises because it is largely under producer control and because of its associated influence on the cost of production. Productivity is driven primarily by:

- The number of ewes run per hectare,
- The number of lambs produced per ewe, and
- The weight of lambs when they are sold.

These add up to kilograms of lamb produced per hectare. All of these things are influenced by rainfall, soil fertility, pastures, genetics, choice of lambing date, and target sale date to meet the market you have chosen.

There will always be compromises between these components depending on how you structure the enterprise. Lambing in autumn to target heavy weight export lambs at the end of spring will mean you will carry fewer ewes per hectare than a late winter lambing system turning off lambs for the domestic trade at the end of spring. That is; do you aim to produce a large number of smaller lambs or a small number of big lambs? This concept is depicted in *Table 2*. The net result of each movement will be at least partially dependent on your enterprise mix, pasture resources and climate.

Table 2: The effects of production system on key profit drivers

	Autumn lambing for export market	Late winter lambing for domestic market	Late winter lambing for export market
Number of Ewes	↓	↑	↓
Lambs Per Ewe	↓	↑	↑
Weight of Lambs	↑	↓	↑

Typically 65% of farm expenses are fixed for the given farm area. Increasing the productivity of the farm spreads those expenses over more kilograms of lamb. Therefore if you spend $200 per hectare on fixed costs (such as labour, vehicles, fertiliser and repairs and maintenance) in order to produce 100kg of lamb per hectare, fixed costs will be $2.00 per kilogram. If you can lift productivity to 125kg of lamb per hectare the fixed costs fall to $1.60 per kilogram.

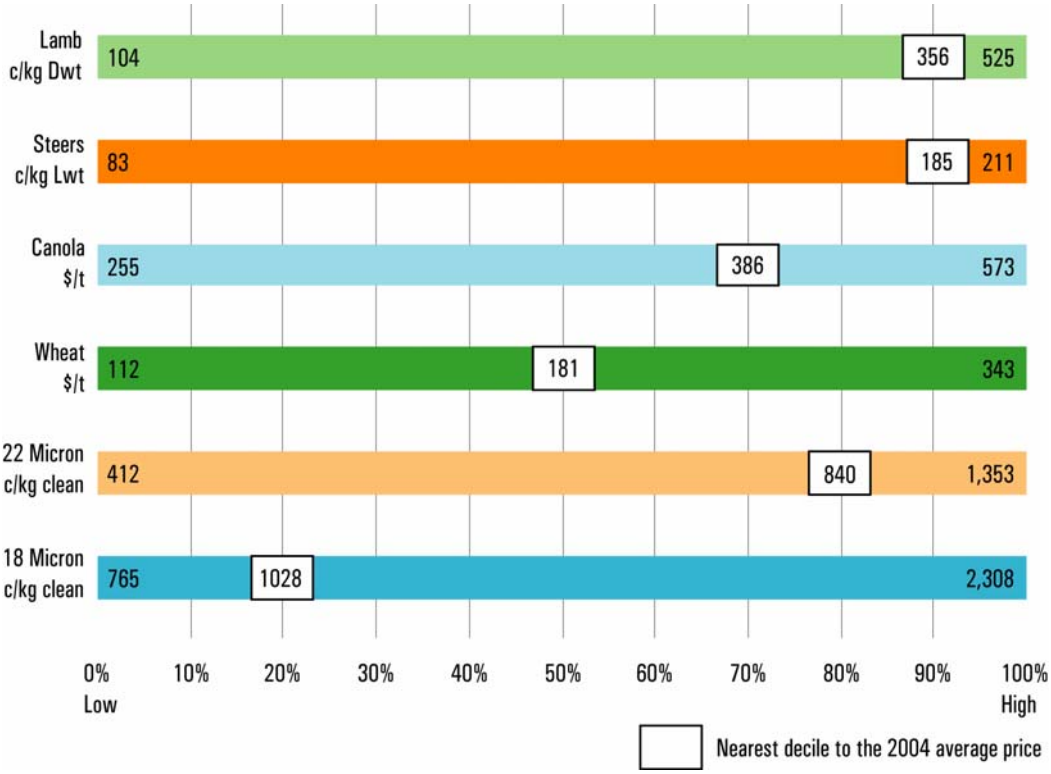
As you increase productivity a point will be reached where every additional kilogram is costing more than it is worth (the concept of decreasing marginal returns). The amount of supplementary feed required for the ewes is usually a key indicator of this in prime lamb production. However, for most enterprises there is scope to improve production per hectare to lower overheads per kilogram of lamb produced. The key issue for every producer is to identify where those opportunities are for the least cost and the least risk. This is discussed in more detail in section two.

For dual purpose enterprises the key differences in profitability between enterprises are due to lamb productivity (kilograms produced) and the value of wool (cents/kg). At current premiums for fineness, there is little advantage from superior wool quality but prior to the recent collapse in premiums the more profitable dual purpose flocks have higher wool values due to lower fibre diameter. At current prices, fleece weight matters rather than fibre diameter but this may not always be the case. Remember the difference in Merino genetics can easily result in a $10 difference in fibre value. This should be a consideration in ewe selection and may warrant selling old ewes rather than joining them to a terminal sire.

1.4 Impact of Current and Future Prices for Lamb

Graph 6 below shows where current prices are in relation to historical prices over the last ten years. Both lamb and mutton are close to the top decile of historical prices. As we mentioned earlier the current prices are helping to boost returns over and above alternative livestock and cropping enterprises.

Graph 6: Price deciles and 2004 prices for the major commodities (nominal 1994 to 2004)



Source: AgInsights 2004, Holmes Sackett & Associates

As a consequence more resources are being switched to sheep meat production which in turn is driving up supply. Both ABARE and MLA expect sheep numbers to rise to approximately 105 million sheep in 2004/05, of which a larger than normal proportion are ewes, further increasing the ability of the national flock to expand. Production is forecast to increase by approximately 8% per annum. If this increase in rate of production continues, the growth in supply is expected to outstrip the growth in demand in the coming 2-3 years. The inevitable consequence is a fall in prices.

This is common sense. The barriers to entry are low in the industry, that is, it is neither extremely difficult, nor extremely expensive for producers to increase lamb production. For example, a traditional self replacing Merino flock simply needs to purchase terminal sires rather than Merino rams in order to commence lamb production. If ewes need to be purchased the barriers are higher but still within the reach of many producers. Therefore, if prime lamb and dual purpose enterprises continue to outperform wool and beef, or even crops, farmers will allocate more resources to their production at the expense of those other enterprises. This process will continue whilst ever profitability is higher.

So what does this mean if you have a prime lamb or dual purpose enterprise? It essentially means that you cannot rely on price to maintain your profitability over the long term. As prices come down the first lamb producers to be squeezed are going to be those with the highest cost of production and lowest productivity. Unless these producers are willing to accept low returns, for example by subsidising the lamb production with other more profitable enterprises or by off farm income, they will be the first to stop producing lamb.
If a producer wants to remain in the industry, or even better, to enjoy above average profitability then productivity and cost of production are going to be the key things to work on.

This does not mean that your sale price is not important. It is still necessary to ensure you meet your target market specifications in order to maximise price. This is worth a few cents per kilogram to you. However the major changes in price received over coming years are more likely to be associated with fundamental changes in industry supply and demand rather than the smaller changes associated with premiums and discounts.

1.5 How Far will Lamb Prices Fall?

To reach a gross margin of $20/DSE (assuming that wool and sheep trading income remain the same per DSE) the lamb price needs to fall to $2.86/kg dressed weight for prime lamb enterprises and to $2.40 for dual purpose enterprises. Referring back to *Graph 6* this is the equivalent to somewhere between the 70th and 80th percentile of historical lamb prices for prime lamb enterprises and the 60th and 70th percentiles for historical lamb prices for wool enterprises. The dual purpose enterprises are buffered by the greater proportion of wool income, whilst obviously the prime lamb enterprises are particularly susceptible to any fall in lamb prices.

1.6 Summary

The main points from this section are that right now the average returns from lamb and dual purpose enterprises are good in comparison to beef or wool. If sheep numbers increase as forecasted, and with it the production of lamb, it is reasonable to assume that lamb prices will start to decline as the rate of increase in production outstrips the rate of increase in demand.

Whilst this is a problem, especially for those producers who have low productivity and a high cost of production, the better producers with below average cost of production and above average productivity can expect to enjoy very good returns for some time.

If producers wish to ensure high profitability they need to aim for above average productivity and below average cost of production. Achieving them will make the business more resilient to market changes.

In addition to the vagaries of the market there are also the vagaries of the seasons which may be exacerbated in systems with higher production. However evidence for the 2002/03 drought shows that the better managers are able to sustain high production and high profitability over the long term, not just in any given season.

Increasing the market and seasonal resilience of the enterprise requires focus on a number of key areas outlined in the next section.

2 Keys to Profitable Lamb Production – Beyond 2005

2.1 Directions to Improve Flock Profits

All commodity producers suffer from declining terms of trade. This situation has been occurring since the industrial revolution, which provided the catalyst for specialisation across a range of sectors in the economy. Efficiency gains in agriculture have been a trigger for the industrialisation and subsequent urbanisation that is a feature of modern economics.

There is no reason to consider that this trend is about to change. It is inexorable. It occurs because productivity gains enable the commodity to be produced for a lower cost and over time, efficient markets reflect the lower cost of production in the price they pay.

In a market where producers are striving to earn higher profits than their competitors, producers improve productivity which in turn leads to further reduction in prices. This is a 'catch 22' situation but it is not new. The industry has been managing to achieve substantial productivity gains since sheep were first introduced to Australia. Some of the most dramatic have come through technologies such as fencing, prior to which we needed one labour unit per 300 sheep, mechanical shearing, mechanisation (including tractors, motor bikes, wool presses), 'sub clover and super' and exotic perennials.

Australian lamb producers can stand aside and refuse to be part of the treadmill of productivity gains and theory would have it that in doing so they should be able to prevent further declines in the real value of lamb. Such an approach may be achievable if the Australian lamb industry had no competitors, either from other countries or producers of competing meats such as pork, chicken and beef. Those competitors also seek efficiency gains that drive down prices over time. If the lamb industry chooses to stand aside and ignore this trend it will do so at its own peril.

2.2 Productivity Gains

Sheep producers as a group have not been achieving the necessary productivity gains over the last 25 years that are required to remain competitive. Of the two major sheep enterprises, lamb has performed better than wool though both have failed to match the decline in terms of trade over the same period.

Declining terms of trade need to be met by productivity gains for producers to maintain long term viability. Failing to match the declining terms of trade will result in resources being diverted to other industries which, in the case of wool, are likely to include cropping, beef or lamb production. Comparative productivity gains for the major broad acre industries in Australia are shown in *Table 3*.

Table 3: Productivity of terms of trade for southern Australia broadacre industries (1978-2002)

	Total Factor Productivity[#]	Terms of Trade	Difference
Specialist Sheep (wool)	0.8%	-2.1%*	-1.3%
Specialist Sheep (lamb)	1.4%	-2.1%*	-0.9%
Specialist southern beef	1.3%	-1.5%	-0.2%
Sheep – crops	2.5%	-2.5%	0%
Specialist crops	3.3%	-2.6%	+0.6%

Source: Productivity in Australian Livestock Industries 1977/78 to 2001/02, ABARE April 2004

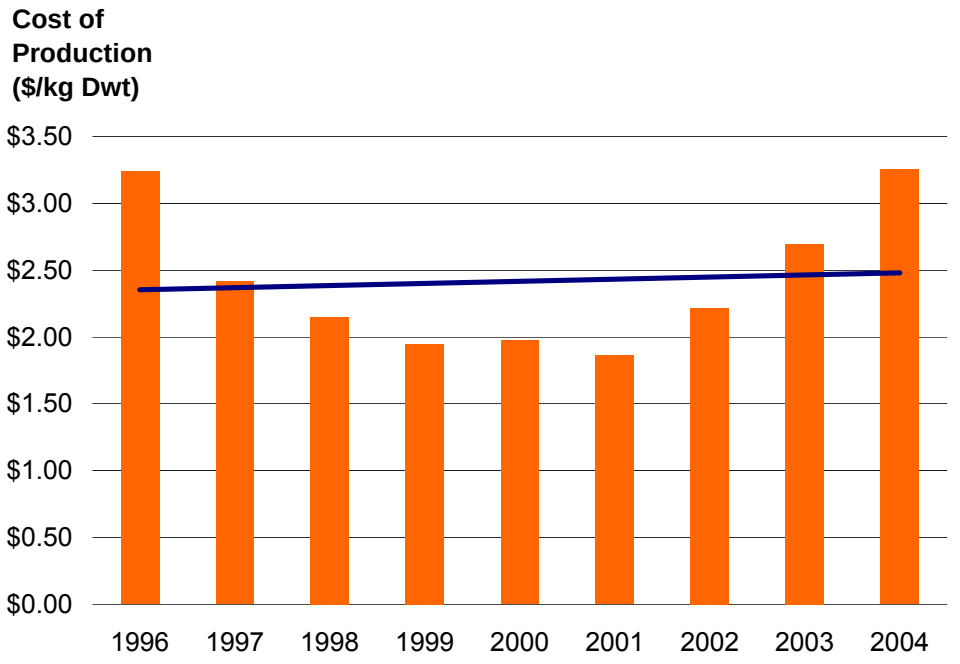
* Separate data for wool and lamb specialists not available

[#] Total factor productivity is a measure of total output relative to total input

It is apparent from *Table 3* that the grazing enterprises have had the lowest rate of productivity gain. Of the livestock, lamb has done the best but only just. Specialist cropping was the only enterprise where productivity gains exceeded the decline in terms of trade. As a consequence resources have been diverted from sheep production into other enterprises, particularly into cropping. If the gap between terms of trade and productivity of sheep enterprises is not at least eliminated, but preferably reversed over the medium to long term, the resources devoted to sheep production will continue to decline.

Graph 7 shows the trend in cost of production for a group of lamb producers since 1996. In nominal (not adjusted for inflation) terms there is no apparent trend for a reduction in cost of production. The two high years on the right hand side are primarily due to the effects of the drought. Though this does not represent the whole industry there is concern that, over the nine years shown there is no evidence of a declining trend in cost of production. Why? Partly because the lamb industry (along with other broad acre livestock industries) has not been focused on productivity gains and in more recent times it has been seduced by price. Despite the overall trend there are individual farms that are, over time, reducing their cost of production per kilogram of lamb.

Graph 7: Cost of production trend over time (nominal prices)



Source: Holmes Sackett & Associates, Farm Monitor Project

2.3 Where do you Sit?

Cost curves have long been used as a fundamental business tool in the mining industry. Few miners would not know where they sit on the cost curve for the particular commodity that they are producing. They have not been used in agriculture but they are a useful management tool that can provide a new perspective on your farm business.

Cost curves show how much product is produced for a given cost. They take into account the fact that in some industries the lowest cost producers may be larger than average while the high cost producers can often account for a relatively small proportion of the total amount of production. This is similar to the 80:20 rule or Pareto principle where 80% of the product is produced by 20% of the producers. That is not to say that this situation applies in all agricultural products but cost curves allow for the fact that the volume of production varies with different producers. Therefore, it enables you to look at where you sit in relation to the rest of the industry that is producing the same product as you. The more characteristics of a commodity your product has, the greater the value of cost curves. The greater the difficulty in differentiating a product in order to command a premium in the market place, the more the profitability of each player in the industry is determined by the cost of producing each unit of product. For example, of the broadacre agricultural commodities, lamb, beef and canola are probably the three that closely resemble commodities.

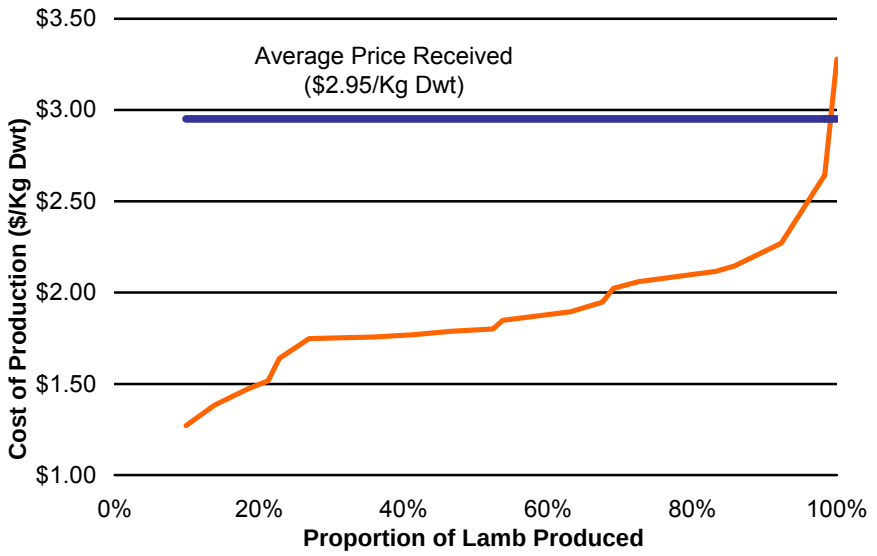
In *Graph 8*, the cost curve is based on farms with at least three years data since 1997/98. For each farm the cost of production and the quantity of product produced has been averaged over the number of years for which information is available (1998-2004). Therefore the data represents a medium term picture of performance rather than one year which can influence the results positively or negatively. The effect of the recent drought is included in the data. The results are then ranked according to the average cost of production. As an example, approximately 70% of all lamb is produced for less than $2/kg Dwt, 20% is produced for less than $1.50/kg Dwt and 100% is produced for less than $3.28/kg Dwt.

Remember that the farm businesses (a total of 55) that are represented in this group are not a random sample, so the cost curves are not representative of the whole Australian industry. The sample is biased toward the better and lower cost producers so keep that in mind when interpreting the graph.

On the cost curve we have included the average price of lamb over the same time frame as the data in the curve.

The cost or producing most lamb has been well below the average price. These figures include lamb from dual purpose and prime lamb flocks. All but the most inefficient lamb producers should be making money at last year's lamb prices when the highest cost producers are around $3.30 per kilogram dressed weight (*Graph 8*).

Graph 8: The cost of producing lamb has been well below the average price (98-04)



Source: AgInsights 2003, Holmes Sackett & Associates

To get the best out of the available information we suggest a logical approach to using cost curves as a tool to look at your business:

- Calculate your cost of production and identify where this places your lamb enterprise on the cost curve.
- What segment of the industry does this put you in? Are you a low cost producer which means in times of falling demand, and hence price, that you will still be able to produce lamb profitability. What proportion of lamb in this sample is produced at a lower cost than yours?
- The curves provide an indication of the range of performance within a group of farm businesses. The closer you are to the right hand side of the graph, the more vulnerable your business because most lamb will be produced for a lower cost than yours and you will be one of the first to be affected in times of lower prices. The closer to the left hand side, the more resilient the business is in times of declining demand or prices and also the greater the profits during times of high prices.
- What is the difference between your long term average cost of production and the average price? The difference is your margin per kilogram. Multiply that by the amount of product you produce and that will indicate your profit. Compare that to the margin of the lower cost producers. If you could produce for the same cost as they do, that is move your business down the cost curve, you can calculate the effect that it would have on your profit.
- If your cost puts you on the right hand side of the graph, you need to consider what action you are going to take because the fundamental problem you have is that you are uncompetitive in the industry. This will mean profits will be hard to come by during periods of low prices and in the long term you cannot continue along that path unless you are prepared to prop that enterprise up by some other means.
- The cost curve provides a target for what can be achieved. It does not explain how to go about achieving a low cost business; that is a separate task once you have identified, at the broad scale, how your business performs. This is discussed in later sections.
- Develop a plan of action to address any issues that may be causing your business to have an uncompetitive cost structure. The aim should be to have your business in the lowest quartile of the cost curve. If you identify a number of areas for action, and most businesses can, don't try to do everything in one year. Prioritise them into the ones that are going to give the best result and are easiest to achieve. Leave the hard ones or the costly ones aside until the easy ones have been addressed. Be realistic about what can be achieved.

Be aware that cost curves move over time. As productivity improves, mainly through improved technology, costs are lowered by 2-4% per annum for most commodities. This is reflected in declining real prices over time. You need to ensure that your position on the cost curve does not become eroded over time otherwise your competitiveness is being eroded. Be sure you have a plan to maintain your position. It might be achieved through superior technology, capital investment to reduce labour costs, genetic gain of plants or animals or improved pasture productivity.

2.4 Changing Cost of Production

Cost of production is a ratio with total production on the numerator and total kilograms produced on the denominator. For example, a flock that produces 100,000kg Dwt of lamb for a total cost of $200,000 has a cost of production of $2.00 per kilogram Dwt.

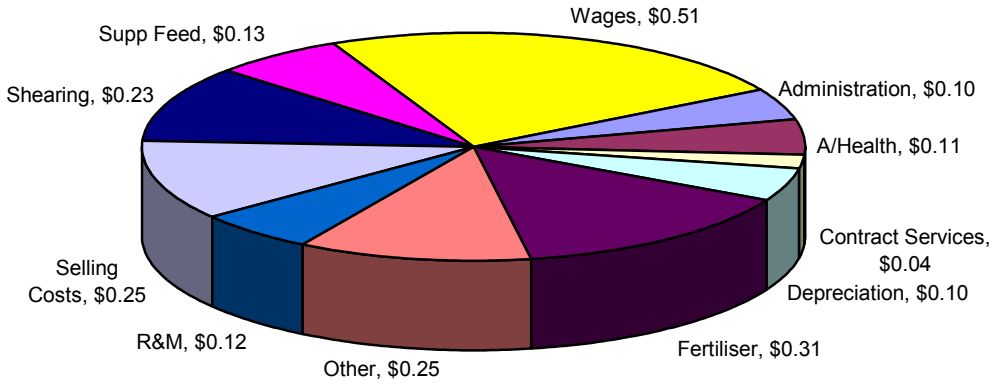
$200,000 cost
100,000kg lamb = $2.00/kg Dwt

Therefore cost of production can be altered by increasing production providing any associated cost increases are of a smaller proportion. Alternatively cost of production can be reduced by reducing costs whilst maintaining production. Both of these options are discussed below. All cost of production data are before financing costs (interest, lease, etc) and do not make any allowance for the cost of capital in business (land, stock, plant).

2.5 Cost Reduction

The factors that make up the cost of production are important when determining where to direct priorities to lower production costs. *Graph 9* shows the components of the cost of producing a kilogram of lamb.

Graph 9 : Components of lamb production costs (total = $2.16/kg Dwt)



Source: Holmes Sackett & Associates (98-04)

For many flocks the greatest potential for reducing production costs in the business will be via a reduction in the labour cost, principally wages with shearing, fertiliser and selling costs are the next most important categories. Any reduction in these costs, when measured per DSE, is only likely to be achieved through increased production to spread the overhead component of the costs over more kilograms of lamb rather than by cutting absolute costs per se. In most agricultural businesses, there is little room remaining for cuts in costs with the exception of labour. Producing more from the same inputs is the key.

2.6 Increase Production

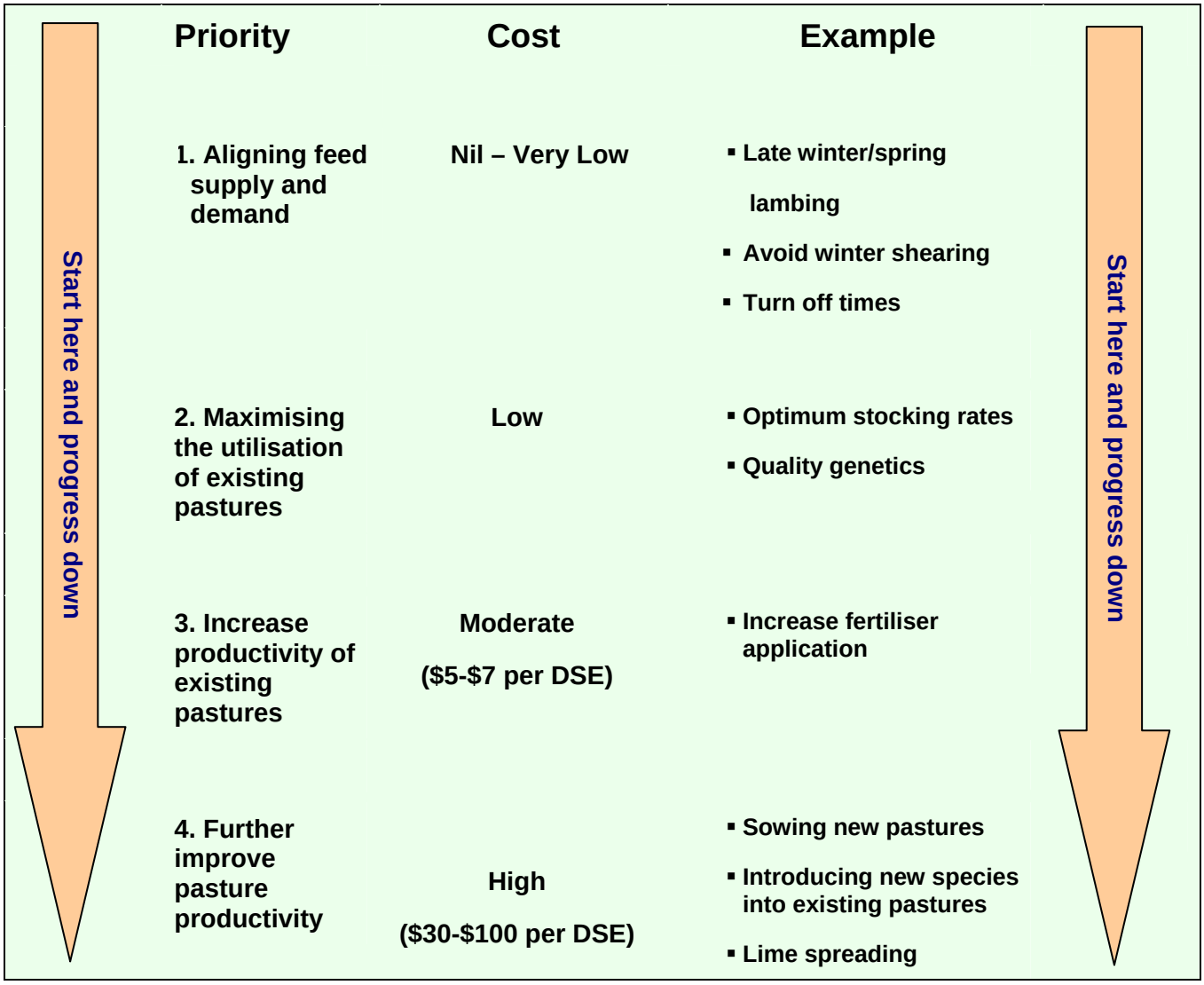
As most costs in lamb producing businesses are already at a low level, which has been an imperative for survival over the last ten years in particular, it is likely to be easier for farm businesses to lower their cost of production by increasing production without a commensurate increase in costs. The sources of increased production can be divided into two categories, those that can be achieved by implementing existing technology and those that will rely on as yet unknown technology. It is not the objective of this paper to identify the technologies that will provide the technology gain – that is the role of research. Rather the discussion will focus on the cost centres and productivity of the business in order to provide an indication of the potential areas for improvement and the extent of the gains required.

Most of the information that follows is about how to manage your cost of production in your own business.

2.7 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. Examples might include an adjustment of lambing time to reduce supplementary feed costs. When it comes to per hectare production, the focus is about growing and using pasture. The place to start is to ensure that you are currently efficiently utilising the pastures that you currently grow. It makes little or no sense to grow more if it is already being wasted. Once utilisation is improved the next step is to produce more pasture as cheaply as possible and to match the increase with increased stock numbers. This is not about high stocking rates but rather it is about high pasture productivity and using that pasture. Once the productivity of existing pastures is improved, it is time to invest in the essential but longer payoff strategies such as lime application or sowing new pastures. These priorities are illustrated in *Figure 1*.

Figure 1: Suggested program for improved productivity



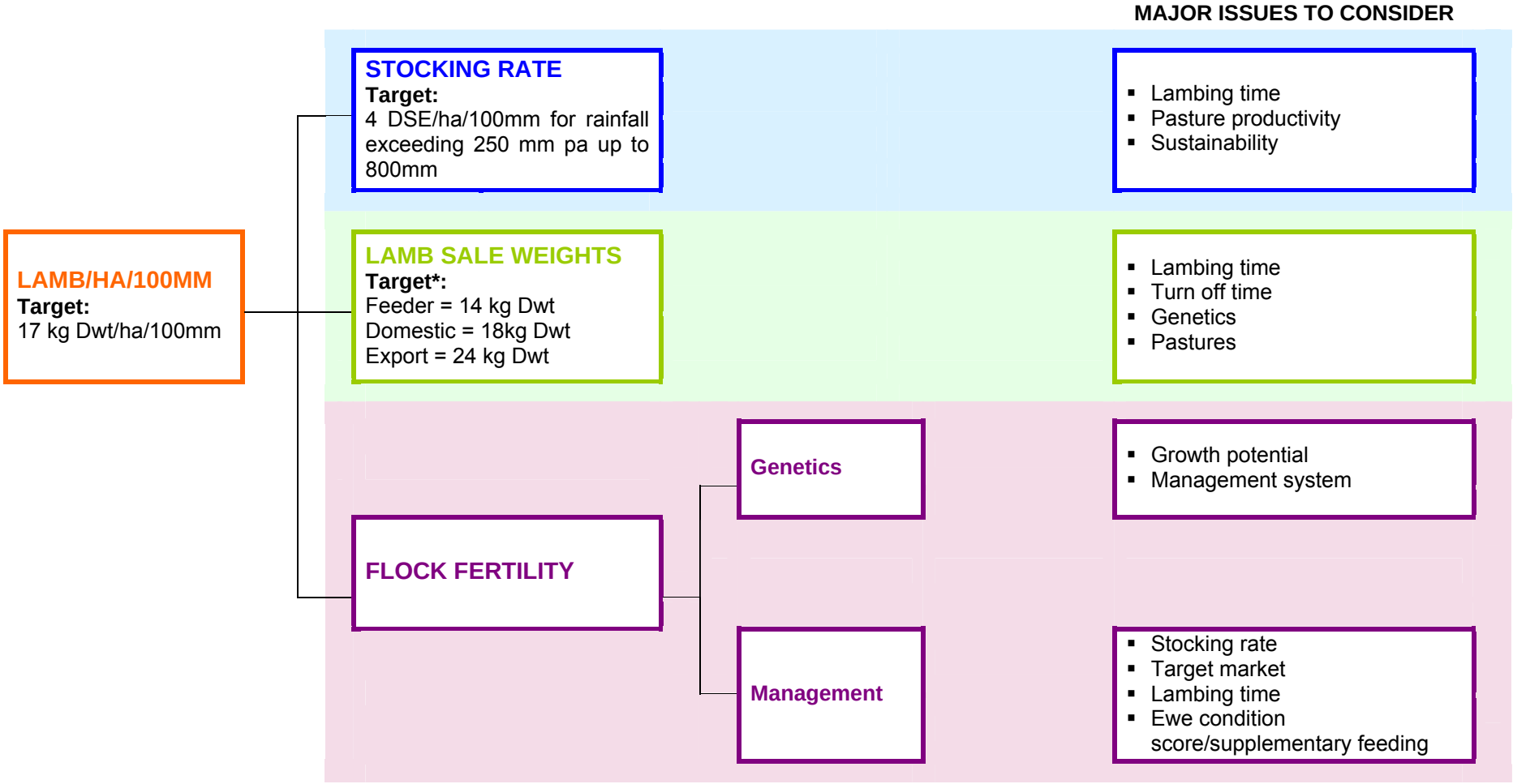
2.8 Per Head or per Hectare

One of the key changes that is required to focus on cost of production and hence profitability is to move from thinking about per head returns to per hectare returns. Approximately 70% of the assets in any farm business are tied up in the land. Only 10-20% is in the livestock. If you run your farm focusing on per head performance in order to improve profitability only limited gains can be made. Per head measures that are commonly used include price per head, sale weight per head and lambing percentage. If you are a lamb producer and measure flock performance primarily by these

measures you will be missing the main story. It is not that these measures are irrelevant but rather they are a means to an end, not an end by themselves.

Table 1 demonstrates that the more profitable lamb producers produce more kilograms of lamb per hectare. The principals relating to how are pictured in *Figure 2.*

Figure 2: Factors that influence per hectare production of lamb



***Note: These are suggested optimums. Producing heavier lambs in many cases may reduce overall profitability due to the high cost of additional kilograms.**

A suggested target productivity for prime lamb production is 17kg/ha/100mm. The three key influences of this productivity target are:

Stocking rate

The key time of year to measure stocking rate for most regions where prime lamb is produced is early to mid winter (June/July). At this time of the year you want to ensure that the stocking rate of your lamb enterprise is 20% higher than district average stocking rates. Where you have a winter dominant rainfall the best rule of thumb is the French Shultz model which suggests an optimum stocking rate of 4DSE/ha/100mm above 250mm. 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 then look for local benchmarks above the district average. It is stressed that these are generic targets and they need to be tailored to your farm. Some farms with poor quality soils and low quality land classes will be constrained by environmental benchmarks well before they reach these stocking rate targets. It is important that these stocking rate targets are long term targets – it is no good meeting them one year at the expense of longer term productivity. Determining long term optimum stocking rates that meet profit and environmental objectives is one of the hardest decisions in livestock production but it is too important not to get it right.

Increasing stocking rates will have major interactions with lamb liveweights and flock fertility because individual animal performance will be suboptimal where per hectare performance is maximised. To help manage these negative impacts you should pay attention to lambing time and pasture production. Choice of lambing time will determine how closely ewe requirements are matched to pasture availability. At higher stocking rates you will also need pastures that are able to persist and provide adequate ground cover in autumn, which will be a function of species selection and soil fertility.

Lamb weight at sale

Lamb liveweight targets are dependant on your choice of market, ie feeder lambs, domestic market lambs or export lambs. Each market requires a different length of time to reach and therefore requires a lambing time further from the optimum from the point of view of matching pasture availability to ewe requirements or the pasture quality available for high growth rates in the lambs.

With this in mind the target should be the minimum requirement to meet the market specifications that you are aiming for, 24kg for export lambs, 18kg for domestic lambs and 14kg for feeder lambs. Producing lambs heavier than these targets will often achieve a higher per head price but will come at a cost of lower per hectare production. Consideration should be given to genetics, specifically in relation to the growth rate and maturity pattern of rams used in order to ensure that they arrive at target weights at the right fat score.

Flock fertility

Flock fertility is important but not at any cost. The two key opportunities for improvement are through genetics and management. Maternal Central Progeny Test (MCPT) results show a $20/ewe/year difference from average to best, of which fertility comprises 60%. Genetics are not a quick solution but given that superior genetics are virtually free with the exception of a small premium for the ewes or rams they are worth pursuing.

Management can influence fertility through choice of joining time to best fit the compromise between the seasonal oestrus activity (increases into autumn) of the ewes and condition score at joining (often decreases into autumn). Usually however, the decision is based more on the target market for the lambs. Management decisions also relate to tactical supplementary feeding and stocking rate decisions in order to meet optimum condition scores in sheep. Unlike genetics, management influences usually 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 flocks achieve higher lambing percentages at the cost of low per hectare production. It is important to avoid that trap.

2.9 Increasing Business Scale

The traditional 'get big or get out' has long been one of the methods that farmers have used to improve efficiency. It offers a simplistic recommendation to what is a complex issue.

Firstly some farms do suffer from a lack of scale. These will typically be those that have less the $3-4 M invested in the business. At today's land values of say a conservative figure of $250/DSE, that represents about 12-16,000 DSE. These smaller farms suffer because they do not have sufficient production over which to spread their overhead costs. Not that this does not mean that an enterprise needs 16,000 DSE because the scale may be achieved with two enterprises, for example 6,000 DSE of sheep and 500 hectares of crop. For most farms scale is more about the whole business than it is about individual enterprise size. Having said that, six enterprises each with 2,000 DSE would obviously be inefficient.

If lack of scale is currently limiting productivity and resulting in an uncompetitive cost of production there are a number of options:

- The farm can be treated as a part time job and surplus labour can be sold to someone else.
- The farm can be supported by off farm income.
- The business can be expanded by intensifying, that is producing more from the current area.

On many farms the last option is quite possible by improving the pasture productivity and then by running the most efficient lamb production system to harvest that pasture. The advantage of this approach is that it tends to be relatively low cost compared to going out and buying the farm next door, particularly at current land prices.

If the current farm is at its productive limit, the next option for expansion is with additional land. This can be done by owning the land or by paying for the right to use someone else's land, for example, in a leasing arrangement. The advantage of leases are that they are require only sufficient working capital for running costs and stock purchase so they represent a means of expansion when capital is limited. Unfortunately during the last couple of years the price being paid for leases has doubled and in some case nearly trebled. That might be fine during periods of high commodity prices but it does present some risk if commitments are made over a longer term lease.

2.10 Land Purchase

This leaves the option of expansion by additional land purchases. For those expanding the business, they will need to ensure that they achieve substantial benefits from economies of size in order to justify the purchase of land on the profit expected prior to any capital gain. That is, there must be an absolute minimum of additional overhead expenses such as depreciation and labour that come with the additional land. The effect of carrying overheads on the returns from additional land purchase is shown in *Table 4*. These figures assume an average gross margin and overheads for a grazing farm for the last seven years.

Table 4: The return on capital from additional grazing land purchased with varying proportion overheads associated with the new land

	$/Ha				
Average Gross Margin (7 years)	$214				
Average Overheads	$133				
Average Profit	$82				
Total Asset Value	**$2,770**				
	% Overheads with additional land				
	20%	**40%**	**60%**	**80%**	**100%***
Return on additional capital received	7%	6%	5%	4%	3%

* Equivalent to buying an additional farm which would be a completely separate business unit

Remember the average of this group is well above the average of the industry so average performance in this group is, in reality, a good result. If the overhead costs for the additional land are less than around 60% of what they are for the existing farm, the return on the investment in the additional land (before interest) is quite acceptable. It is only when you are considering a stand alone farm which must carry all the overheads that the returns are quite low.

2.11 Capital Appreciation

Table 4 excludes any return from capital appreciation, which has produced two thirds of the total farm business returns over the last seven years. Therefore, the critical question with additional land purchases becomes one's expectation on changes in future land values. For some farms that are run down or can be purchased cheaply, capital appreciation may be quite likely. For other farms that will depend on the general increase in land values. To further increase in price, capital appreciation

may be less certain or even negative though being close to major population centres may mean different drivers of land prices than in more farming oriented districts.

2.12 Labour

Your ability to lower labour costs is a source of significant potential wealth from your farm business. Those farms where the cost comes in the form of cash paid to employees tend to be more receptive to lowering costs than those where the people who are self employed. Labour efficiency is not just about how much time is spent in the business, it is also about where you spend the time. It does not matter if you walk onto a farm that has high or low labour efficiency, the person you speak to will be busy and feel that they have no time to spare. Despite all being busy, some people run while others struggle to run half that. The difference between them is not just due to some working harder than others.

The issues of labour efficiency and the associated costs are important because labour is a very large component of total farm costs. Labour costs typically make up 35% of the total expenses for the farm each year. This includes owner wage costs, employee costs and contractor costs. To provide some idea of the importance of this issue, the labour efficiency for flocks of varying profitability is shown in *Table 5*.

Table 5: Labour efficiency and flock profitability

	Bottom 20%	Average	Top 20%
Dual Purpose	5500	6900	12,300
Prime Lamb	4500	8100	9900

Source: Holmes Sackett & Associates
Note: excludes shearing and contracting labour

To help interpret them, it is reasonable to assume that one ewe is equivalent to 2 DSE so a reasonable target is 5,000 ewes per full time equivalent. If you are currently running less than 3-4,000 ewes per full time equivalent improving labour efficiency should be a priority for your business (note that if you only have 3,000 ewes you can still run 5,000 per unit by having 0.6 of a labour unit run the sheep; small flocks are still able to achieve high labour efficiency.)

Because the ability to generate farm income is the number one profit driver, you should not be looking to reduce labour costs per hectare at the expense of farm income. That will invariably be an unprofitable thing to do. You should be aiming to either earn the same amount of income with less labour or earn a greater amount of income with the same labour.

To do anything about this issue you will first need to recognise where the costs are, which is not as easy as it may sound. It is easy to recognise expenses. If you have to send two staff to do a one

person job, then that is an unnecessary expense. Ask why it is that one person can't do the job? Is it an infrastructure constraint? Do you employ people that are flat out for small periods of the year yet it is difficult to find them enough to do for the rest of the time?

The costs that are harder to recognise are the ones that involve forgone income. Typically, this is the farm where the owner never has time to sit down, think of, and act upon, ways of increasing the income of the farm. You may recognise this by looking for the following signs:

- You spend from dawn to dusk in the paddock and when you come home you are too tired to think.
- There is always more than enough to do, including forever fixing situations where the wheels have fallen off.

Preparation and planning save labour but also allow you to maximise income. How are you going to utilise that additional feed that you have this year? Can lambs be pushed out to heavier weights this year? Is there an opportunity to trade some lambs?

If at least one third of your total costs on farm relate to labour then it is worth considering how to minimise that cost. In addition, wherever there is large variation, as is the case for labour efficiency, there is opportunity. If you do not have high labour efficiency then that says there is a potential to improve your returns substantially. There are two broad approaches to having too much labour:

- Increase income and keep labour costs constant through strategies that either change enterprises or expand the total business.
- Reduce labour and maintain income through better infrastructure or management.

2.13 Genetics

Numerous research and extension programs have highlighted the potential impact that the selection of better genetics can have on your prime lamb business.

A ram purchased that is capable of producing progeny 2kg heavier than your current average liveweight of lambs sold, joined for four years at a ram to ewe ratio of 1.5% in a flock of ewes that average 115% lambing with five year average prices of $3.00 per kilogram dressed weight inclusive of skins will return the buyer an additional $600 worth of income after future cashflows are discounted back to today's dollars at a rate of 15% per annum. This means that the buyer can spend up to $600 more than the price paid for rams of their existing quality and before a loss is incurred. This is not to say that the buyer should spend that much on the ram of superior quality as the less spent the better the return.

For self replacing flocks or where 1st X ewes are being purchased for prime lamb production, the rams used to breed the replacement ewes can also have a big impact on profitability. This was well researched in the Maternal Central Progeny Test where substantial variation in weight of lamb produced per ewe was found to exist depending on which sire was used.

In the final report of this project, compiled by the NSW and Victorian Department of Primary Industries, as well as the Australian Sheep Industry CRC, it is reported that the maternal sires can substantially influence all of the key profitability traits of their daughters including lambs weaned per ewe joined, growth rate, carcass conformation, meat yield and wool traits. When all of these things are combined the best sires tested produced ewe progeny capable of $40 higher gross margins per ewe per year than the worst.

The relative weighting of traits will vary according to the enterprise that is being run. Dual purpose enterprises, having more wool income, need to put a lot more emphasis on the wool traits than a specialist prime lamb enterprise.

Given the returns available from improved genetics it cannot be stressed enough how important finding the best genetics is for the prime lamb or dual purpose enterprise.

2.14 How Resilient is my Business to Unfavourable Seasonal Conditions?

The effects of drought will often come quicker to those who run more productive systems. However, comparison of benchmarking performance prior to and during the 2002/03 drought confirmed that it is not how you operate in the seasons prior to the drought that determine the impact that it will have on your business, but rather the planning processes before and during the drought that are critical.

Simply, those who were more profitable prior to the drought because of their increased productivity also tend to be more profitable over the long term, taking into account the drought years.

The key elements of prior planning for a drought are fodder reserves and feeding systems. In essence the questions that need answering are:

1. What fodder can I buy/make and store on farm and at what price do I need to buy/make and store it to be a profitable preparation strategy for the next drought?

2. Where and how will I feed my livestock during a severe drought in order to protect my pastures, maintain stock health and minimise deaths, and minimise how labour intensive the process is?

Most lamb producers will be making decisions on fodder conservation / storage and feeding out on a more regularly basis than simply in drought years. Production and short-term feeding will be necessary in many years, if only for a brief period. Producers who establish systems for short-term feeding and then extend these systems to incorporate drought fodder reserves will develop expertise and confidence. Furthermore, turnover of fodder for short-term feeding will reduce potential difficulties in some storage systems. Increased efficiency will occur if infrastructure is utilised regularly. Under present conditions, both a well set-up silage system or opportunity storage of grain based on trigger prices offer systems which will reduce both price and supply risks during drought.

The most important action for all producers is to determine the drought fodder reserve required and to take steps now to make provision for that amount. The actual system used should and will vary between producers, with each producer deciding in their enterprise which system is most suitable.

2.15 Decision Making During Drought

Having planned and prepared for the next drought or feed shortage, it still needs to be determined whether to sell or supplementary feed all, some or none of the flock when confronted with the feed shortage.

Unfortunately there is no simple recipe which provides foolproof answers for such a situation. History tells us that each drought or feeding period will bring its own unique circumstances.

Lamb sheep and wool prices, feed grain prices, and the resources available to handle the drought will vary between years and between farms within years. Therefore any given manager must have a disciplined approach to working out the best strategy at the time. To work this out he/she must be able to estimate the following:

- The current value of the livestock,
- The probable cost of feeding,
- The value of any production that would be gained should they be kept, and
- Their future replacement value should that be necessary.

The answers to these questions are complex. To quantify some of these variables requires the manager to make an '*educated guess'.* There is a large degree of uncertainty in regards to what will happen at a future date. However, the decision process should include;

- Whether the farm can finance the decision,
- Whether the management has the experience, or access to the experience, to manage a droughtlot,
- The risks associated with restocking, and
- Any future losses that may be incurred due to lower quality genetics when replacing the ewes.

Making the business resilient to unfavourable seasonal conditions entails protecting the investments you have made in order to lift productivity and also minimising the losses in the year where the unfavourable season occurs.

Of the possible areas for investment described previously to the profitability of a lamb producing enterprise some of the more obvious areas that are susceptible to loss of value are:

a) Soil fertility (due to erosion, inability to fertilise due to low cashflows,
b) Pasture species. Death of pasture species from overgrazing during adverse conditions, and
c) Livestock - death or forced sale of livestock.

2.16 The Path Over the Next Five Years?

There are a large number of potential areas for improvement in productivity and it would be unlikely that the individual producer is at the limits of available knowledge and technology for all of them. These opportunities have been mentioned throughout this document but in summary include:

- Soils and pastures
- Genetics
- Fine tuning of the production system
- Labour productivity
- Scale

The process of reviewing these potential areas for improvements in profitability of the enterprise should be continual and should be based on identifying and implementing those changes that are going to provide the best return for the least cost. It is rare that a new technology comes along to revolutionise the profitability of an industry, therefore producers should accept that improvement is an evolutionary process and develop a systematic and methodical way of capturing the benefits of further improvements.

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