

# Southern beef case study

## MLA Cost of Production



The following case study outlines how a southern beef producer would calculate their beef cost of production using the MLA Cost of Production calculator. The southern beef herd used in this case study is described in Table 1 below.

**Table 1: Profile of the southern beef herd used in this case study**

Heifer and adult cow numbers	260
Breed	Self-replacing Angus
Production system	Controlled mating, July calving
Target market	420 kg feeder in late spring

This case study business also has a prime lamb flock, comprising 45% of the business total dry sheep equivalents (DSEs), and an opportunistic goat harvesting operation (refer to the goat and prime lamb case studies for trading details and expenses). This provides users the chance to see how the cost of production tool and resulting reports will look for a multi-enterprise business.

Businesses with one enterprise or wishing to participate with only one enterprise are able to tick which one before starting, and the tool's functionality will be adjusted for the enterprise nominated.

However, note that if a business does have multiple enterprises and choose to calculate the cost of production of only one, they must be careful not to over-allocate expenses, such as overhead and labour expenses, to that enterprise. This will generate an inflated cost of production estimate.

### Trading details

When in the 'Trading details' tab you will need to navigate your way to the 'Beef' section if you are calculating the cost of production of multiple livestock enterprises at once. The 'Beef' section captures any production and income associated with your business's beef herd.

It is important to pay close attention to livestock age brackets. To do this, ensure that inventory numbers contain only the livestock age groups that they represent. This ensures the value of stock held within the herd is captured as they grow. Table 2 shows the age brackets associated with each stock class.

**Table 2: Livestock categories and corresponding age brackets for inclusion in calculator**

Stock class	Age bracket
Cows	> 2 years
Calves	0–6 months
Weaners	7–12 months
Heifers	1–2 years
Steers 1 yr	1–2 years
Steers 2 yr	> 2 years
Bulls	> 2 years

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Categories used will depend on whether opening and closing livestock numbers relate to a calendar or financial year.

If calving occurs close to the end of the year and numbers are not yet known, it is recommended to leave them out of the 'Calves' closing numbers. Once the calves are marked or weaned and numbers are known, they can be included in the 'Calves' or 'Weaners' inventory values. In the example provided below, as the numbers relate to a financial year input and as calving starts in July, there are no calves. Natural increases will appear as weaners.

Using the same opening and closing inventory values based on five-year average prices at the beginning and the end of the year is recommended.

Table 3 shows the livestock flow for a southern beef business. This table contains the opening and closing livestock inventories, as in the beef cost of production tool, plus four additional sections that producers may use to help reconcile their own livestock flow. The four additional sections are:

1. Purchased and transfers (internal transfers between enterprises)
2. Natural increase (calves marked)
3. Sales and transfers (internal transfers between enterprises)
4. Deaths.

Transfers refer to the transfer of cattle between different herds or properties within the same business if their cost of production is to be analysed separately. Otherwise, producers are able to amalgamate herds to generate a whole-business beef cost of production. As in the cost of production calculator, it is not necessary to transfer cattle between age categories. However, it is necessary to move carry-over livestock up age categories each year to capture their value.

In this case study, the herd structure is stable, with no changes between the opening and closing inventory. There are 220 cows (> 2 years) in the opening livestock inventory.

Throughout the year, 35 cows are sold, five die and 40 heifers (1–2 years) move up an age bracket, leaving 220 cows in the closing inventory.

The 230 calves in natural increase move up an age bracket to weaners (7–12 months) at the end of the year, represented in the weaner closing numbers.

Of the 230 weaners from the previous year in opening numbers, all of them move up an age bracket to steers 1 yr (1–2 years) and heifers. From those weaners, 115 steers 1 yr and 75 heifers are sold. The remaining 40 heifers are kept as replacements and joined for the following year, and are represented in the heifer closing inventory.

There are no steers kept beyond two years of age, hence none are represented in the inventory. There are four bulls in the opening inventory; two new bulls are purchased, one is sold and one dies, leaving four bulls in the closing inventory.

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**Table 3: Illustration of livestock reconciliation for financial year reconciliation**

	Opening	Purchases and transfers	Natural increase (calves marked)	Sales and transfers	Deaths	Closing					
<b>Cows</b>	220	0	0	35	5	220					
<b>Calves</b>	0	0	230	0	0	0					
<b>Weaners</b>	230	0	0	0	0	230					
<b>Heifers</b>	40	0	0	75	0	40					
<b>Steers 1 yr</b>	0	0	0	115	0	0					
<b>Steers 2 yr</b>	0	0	0	0	0	0					
<b>Bulls</b>	4	2	0	1	1	4					
<b>Total</b>	494	+	2	+	230	-	226	-	6	=	494

Table 4 outlines the sales and purchases for the southern beef herd case study. The cow, heifer, steer and bull sales accrue to 89,800 kg lwt and \$200,000. Only two bulls were purchased, for \$5,000. There were six deaths. Livestock sales receipts, including sale values and weights, will help complete this section. Figure 1 illustrates how this section should be completed for the southern beef herd case study.

**Table 4: Description of sales and purchases**

Sales					
Livestock category	Number sold	Liveweight (kg/hd)*	Sale value (\$/kg Lwt)**	Total liveweight sold (kg)	Total sales
Cows	35	450	\$1.50	15,750	\$23,625
Heifers	75	364	\$2.30	27,335	\$62,817
Steers 1 yr	115	400	\$2.45	46,000	\$112,700
Bulls	1	715	\$1.20	715	\$858
			<i>Total</i>	89,800	\$200,000

  

Purchases					
Livestock category	Number purchased	Liveweight (kg/hd)*	Purchase value (\$/kg Lwt)**	Total liveweight purchased (kg)	Total purchases
Bulls	2	800	\$3.13	1,600	\$5,000
			<i>Total</i>	1,600	\$5,000

\*Rounded to the nearest kg. \*\* Rounded to the nearest cent.

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Figure 1: Example of how to complete the 'Trading' section

		Opening	Closing	Change
<b>Cattle</b>				
Cows	# stock	220	220	0
	kg/head lwt	500	500	0kg
	\$/head	800	800	\$0
Calves	# stock	0	0	0
	kg/head lwt	0	0	0kg
	\$/head	0	0	\$0
Weaners	# stock	230	230	0
	kg/head lwt	300	300	0kg
	\$/head	600	600	\$0
Heifers	# stock	40	40	0
	kg/head lwt	450	450	0kg
	\$/head	700	700	\$0
Steers 1 yr	# stock	0	0	0
	kg/head lwt	0	0	0kg
	\$/head	0	0	\$0
Steers 2 yr	# stock	0	0	0
	kg/head lwt	0	0	0kg
	\$/head	0	0	\$0
Bulls	# stock	4	4	0
	kg/head lwt	800	800	0kg
	\$/head	1,200	1,200	\$0
<b>Total stock</b>		<b>494</b>	<b>494</b>	<b>0</b>
<b>Total kg/lwt</b>		<b>200,200kg</b>	<b>200,200kg</b>	<b>0kg</b>
<b>Total value</b>		<b>\$346,800</b>	<b>\$346,800</b>	<b>\$0</b>
		<b>Total weight (kgs)</b>	<b>Total value (\$)</b>	
<b>SALES</b>				
Cattle (total)		88,800	200,000	
<b>PURCHASES</b>				
Cattle (total)		1,800	5,000	
<b>TOTAL (sales - purchases)</b>		<b>88,200</b>	<b>\$195,000</b>	
<b>KG of Liveweight Produced 88,200kg</b>		<b>Trading income \$195,000</b>		
<small>(Change in inventory kg + Sales kg - Purchases kg)</small>		<small>(Change in inventory \$ + Sales \$ - Purchases \$)</small>		

## Expenses

### Direct Cattle expenses

When in the 'Expenses' tab, users with multiple livestock enterprises will need to navigate their way to the 'Cattle' section. Once here, users can enter the expenses that are directly attributable to the beef herd. All expenses should be GST free.

If the Cost of Production tool does not have a particular expense category you need, you can click '+ Add expense' and enter it yourself.

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In this case study, the total direct expenses attributable to the beef herd totalled \$20,800 (Figure 2).

Purchase receipts and the tax chart from the business's accounts can be used to help complete this section of the tool. When the tax books do not allow for expenses to be apportioned easily, then use common sense to arrive at the appropriate numbers, but aim to create more categories for the subsequent years to allow more accurate allocation. Bookkeepers and accountants should be able to do this easily.

Note that where there are multiple enterprises, and records do not allow expenses to be allocated easily between enterprises, using the tool for all enterprises helps the user to be confident that allocations are sensible. If one enterprise is allocated a disproportionate amount of the expenses, it will look wrong in the cost of production outcome, and the user can go back and reallocate expenses until the outcomes make sense.

**Figure 2: Example of how to enter direct expenses**

DIRECT CATTLE EXPENSES	Total \$ (excl. GST)
Total herd health costs ?	8,000
Contractors ?	0
Transport and cartage ?	800
Selling costs ?	12,000
<b>+ Add expense</b>	<b>\$20,800</b>

### Supplement expenses

When in the 'Expenses' tab, users need to click 'Expand' on the 'Supplement expenses' section to enter the cost of any supplements fed to the southern beef herd. All expenses should be GST free.

Supplementary feeding for maintenance can be divided among all livestock enterprises, even if it was only fed to one enterprise on the basis that feeding that enterprise meant the other did not have to be fed. This removes bias that occurs if one enterprise is preferentially fed over another. For example, in this case study, the cows are fed 14 tonnes of purchased feed for maintenance. Because feeding the beef herd leaves more pasture resources available to the prime lamb flock, which represents 45% of the farms DSEs, only 55% of the feed cost is attributed to the beef herd.

Where production feeding is occurring (e.g. to put weight on weaners) then the cost is allocated directly to the beef herd.

Supplementary feed costs should reflect market values of the supplement at the time it was fed out, whether it is purchased off farm or grown on farm. Supplementary feed purchase receipts should be used to help complete this section (Figure 3).

**Figure 3: Example of how to enter beef supplement expenses**

The screenshot shows the 'Expenses' tab in the 'Cost of Production' tool, specifically for 'Cattle'. The 'Supplement Expenses' section is expanded, showing a table with the following data:

SUPPLEMENT EXPENSES	Quantity (t)	Value (\$/t)	
Home grown feed fed out	0	0	= \$0
Purchased feed fed out	7.7	210	= \$1,617
<b>Total supplement</b>			<b>\$1,617</b>

## Labour and overheads

### Labour

In the 'Labour' section of the 'Labour and overheads' tab, users can allocate labour expenses to the various livestock enterprises. All expenses should be GST free.

Capital labour should not be included in the cost of production calculation. Significant capital labour is usually associated with infrastructure improvements.

Of the non-capital labour, some will be attributable directly to enterprise related activities, such as calf marking and weaning. The amount used is easy to establish by estimating the number of labour days associated with each of these activities and adding them together.

The remaining labour will be spent in general administration, pasture maintenance, general monitoring and repairs and maintenance. As it is harder to clearly distinguish what enterprise this labour is servicing, then it can be simply pro-rated across the enterprises, based on their relative DSE contribution.

The labour of owner/operators and additional family members needs to be assigned a value in the Cost of Production tool, net of non-cash benefits. Although there is a range of suitable salaries for both roles, values of \$70,000 and \$50,000 are recommended for owner/operators and family members, respectively.

A full labour unit constitutes five labour days per week for 48 weeks, totalling 240 labour days per year. Any less than this is considered part-time labour, and would be

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expressed as a proportion of a full-time unit. For example, if the owner/operator works for three days per week, this constitutes 0.6 labour units.

To calculate the cost of this labour unit to the enterprise, the value of the labour unit is multiplied by the number of labour units it represents. For example, if the labour of the owner/operator in this scenario is valued at \$70,000, the cost to the enterprise would be \$70,000 multiplied by 0.6 labour units, which equals \$42,000.

The Cost of Production tool allows users to add permanent and casual labour units by clicking the '+' button. It also allows users to alter the distribution of each labour unit among the enterprises.

In this business case study, 45% of the labour is attributed to beef and 55% to prime lamb (Figure 4). This reflects the greater labour efficiency of the beef enterprise. No labour is attributed to the opportunistic harvesting of goats, as this is performed by a contractor and is accounted for in direct costs.

There is only one full-time owner/operator in this case study, whose labour is valued at \$70,000. There are no family members or permanent employees working in the business.

There is a casual employee who assists with calf marking (one week) and lamb marking (one week), at a cost of \$2,940. As the casual employee spends an equal amount of time on each enterprise, his labour is split 50% each way to beef and sheep. This brings total labour costs to \$72,940.

**Figure 4: Example of how to allocate labour expenses**

The screenshot displays the 'Labour & Overheads' section of the 'Cost of Production' tool. It is divided into three main sections: 'Allocate Labour Costs to Enterprise', 'Permanent Employees', and 'Casual Employees'. Each section has a 'Change Enterprise Allocation' pop-up window showing the distribution of costs between Cattle, Sheep, and Goat enterprises.

Section	Item	Value	Cattle %	Sheep %	Goat %
Allocate Labour Costs to Enterprise	Cattle %	45	45	55	0
	Sheep %	55	45	55	0
	Goat %	0	45	55	0
Permanent Employees	Owner / operator allowance	70,000	45	55	0
	Cost of family labour	0	45	55	0
	Salaried employee	0	45	55	0
Casual Employees	Casual labour (Wage: \$35/hourly, Hours: 42/week, Weeks: 2/year)	2,940	50	50	0
	<b>Total Labour Costs</b>	<b>\$72,940</b>			



### Overheads

When in the 'Labour and overheads' tab, users need to click 'Expand' on the 'Overheads' section to enter the business overhead expenses. All expenses should be GST free.

Capital expenditure should not be included in overhead expenses. Capital items are those that have a useful life beyond the current year, and are purchased in the interest of future productivity or efficiency. Because there is room for interpretation of capital and non-capital expenditure, some capital items are treated as non-capital items for taxation reasons. It is recommended that true capital expenditure is extracted from financial records to provide a better indication of the cost of production. Capital expenditure may include that used for new fencing, road building, installing new water systems or raising soil fertility levels.

Overhead expenses are those that are difficult to attribute to any one enterprise. The overhead expense categories provide an indication of what these expenses will be, and users can add their own overhead expense categories by clicking on the 'Add overhead' box. Users are able to allocate overhead expenses to the enterprises either as a whole, or individually by ticking the 'Edit individual overhead allocations' tick box.

To allocate expenses as a whole, they may be pro-rated to enterprises based on their contribution to annual average DSEs. Alternatively, overhead expenses may be entered individually by ticking the 'Edit individual overhead allocations' tick box. To allocate overhead expenses individually, other measures such as the enterprise contribution to total income or relative use of labour resources provide a good guide to allocation. Table 5 provides a suggestion of how to best allocate overheads individually.

**Table 5: Overhead cost categories and suggested allocations**

Overhead cost categories	Allocation basis
Repairs and maintenance (sheds, yards, fences, land)	Dry sheep equivalents
Repairs and maintenance (plant and equipment)	Labour
Depreciation	Labour
Admin expenses	Income
Electricity and gas	Labour
Insurance	Income
Pasture costs	Dry sheep equivalents
Rates and rents	Dry sheep equivalents
Fuel and oil	Labour

In the case study, overheads have been distributed to the enterprises as a whole. As beef represents 55% of the total DSEs, it assumes 55% of the overhead expenses. Total overhead expenses for the business are \$128,000 (Figure 5).



Figure 5: Example of how to allocate beef overhead expenses

Trading Details
Expenses
Labour & Overheads
Cost of Production

Labour
+ Expand

Overheads
- Minimise

**Allocate Overheads to Enterprise** ?

**Cattle %**

**Sheep %**

**Goat %**

or

Edit individual overhead allocations

Enterprise Overheads	Value (\$)
Repairs and maintenance (sheds, yards, fences, land) <span style="font-size: 0.8em;">?</span>	<input style="width: 80px; border: 1px solid #ccc;" type="text" value="12,000"/>
Repairs and maintenance (plant and equipment) <span style="font-size: 0.8em;">?</span>	<input style="width: 80px; border: 1px solid #ccc;" type="text" value="8,000"/>
Depreciation <span style="font-size: 0.8em;">?</span>	<input style="width: 80px; border: 1px solid #ccc;" type="text" value="10,000"/>
Admin expenses <span style="font-size: 0.8em;">?</span>	<input style="width: 80px; border: 1px solid #ccc;" type="text" value="9,000"/>
Electricity and gas <span style="font-size: 0.8em;">?</span>	<input style="width: 80px; border: 1px solid #ccc;" type="text" value="8,000"/>
Insurance <span style="font-size: 0.8em;">?</span>	<input style="width: 80px; border: 1px solid #ccc;" type="text" value="12,000"/>
Pasture costs <span style="font-size: 0.8em;">?</span>	<input style="width: 80px; border: 1px solid #ccc;" type="text" value="40,000"/>
Rates and rents <span style="font-size: 0.8em;">?</span>	<input style="width: 80px; border: 1px solid #ccc;" type="text" value="16,000"/>
Fuel and Oil <span style="font-size: 0.8em;">?</span>	<input style="width: 80px; border: 1px solid #ccc;" type="text" value="13,000"/>
<span style="background-color: #2e8b57; color: white; padding: 2px 5px;">+ Add overhead</span>	<b>\$128,000</b>

## Cost of Production

The 'Cost of Production' tab provides users with a breakdown of production, income and expenses for all enterprises, based on the information provided.

The first pane in this tab ('Enterprise') shows the relative income, expenses and cost of production for the three enterprises (cattle, sheep and goats) (Figure 6).

Figure 6: The 'Enterprise' pane shows relative income, expenses, cost of production for the three enterprises



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The 'Cattle' pane, showing more detail, helps users better understand the cost of production of their beef enterprise (Figure 7).

Beef cost of production is calculated as total cost of production for beef divided by the kilograms of beef liveweight produced, and expressed as \$/kg lwt. The tool also provides the margin between beef price received and beef cost of production.

If either the beef cost of production or beef margin seems illogical, use the income, expense and production data from higher in the pane to help diagnose where the error may be.

Return to the section that seems to be the source of the error and check the inputs to ensure they reflect your beef production system.

**Figure 7: Cost of production is \$1.43/kg lwt, leaving a margin of \$0.78/kg of lwt sold**

