Pregnancy scanning: an ultra-sound investment

Contents

The business case for pregnancy scanning

Pregnancy scanning and differential management has been shown to have a return on investment of $5.55 per ewe scanned for the sheepmeat and wool industries.

What is pregnancy scanning?

Pregnancy scanning is the use of an ultrasound machine to determine a ewe's pregnancy status and the number of lambs she is carrying. This information allows producers to manage each group of ewes more strategically. Importantly, managing ewes based on their litter size (whether they are carrying single or multiples) through changes in feeding or paddock allocation at lambing can lead to increased lamb survival. Identification of empty ewes can present an opportunity to differentially manage those that have failed to conceive.

The benefits of pregnancy scanning

Pregnancy scanning is a tool that provides you with information to increase the confidence of the decisions you make for the management of your breeding flock.

The greatest return on investment is achieved by removing passenger ewes from the breeding flock, allowing you to prioritise precious feed resources for pregnant ewes.

Pregnancy scanning also allows you to be more proactive in enhancing animal welfare through the management of ewes according to the number of lambs they carry. This can improve survival of lambs and ewes (particularly multiple-bearing ewes), and reduce dystocia (difficult births) and metabolic disease risk (such as pregnancy toxaemia and hypocalcaemia).

Pregnancy scanning for multiples (sometimes referred to as litter size) is vital to understand where the biggest opportunity is to reduce reproductive wastage in your flock: ewes scanned in lamb; scanning percentage; or marking percentage. For example, scanning percentage and lamb marking rates may be very different, indicating that lamb survival should be prioritised to increase marking rate.

Visit **Making More From Sheep Tool 1.10 Indicative industry benchmarks** for a comprehensive guide to calculating whole farm, enterprise, and productivity benchmarks.

The business case for pregnancy scanning

When joining in peak breeding season (January to April), at least 90% of Merino ewes and up to 98% of crossbred ewes should conceive in the first two cycles. Pregnancy rates can be 10% lower if joined outside the peak breeding season.

Condition score is another key determinant of conception rate. The industry recommended condition score (CS) target for ewes at joining is CS 3.0.

If more than 15% of ewes are not pregnant in the target joining time, an investigation to determine the reason for ewes failing to conceive (e.g., condition score, weather, disease) is necessary.

Image courtesy of AWI

Minimum lamb survival targets

Merino ewes
- single-bearing – 90% survival
- twin-bearing – 70% survival

Crossbred ewes
- single-bearing – 90% survival
- twin-bearing – 80% survival

Pregnancy scanning data can also be beneficial when assessing lambs for their genetic merit as future breeding stock. Understanding the birth type of lambs (i.e. single, twin or triplet) can contribute to assessments of growth rate, liveweight and wool quality, as these are all impacted by birth type.
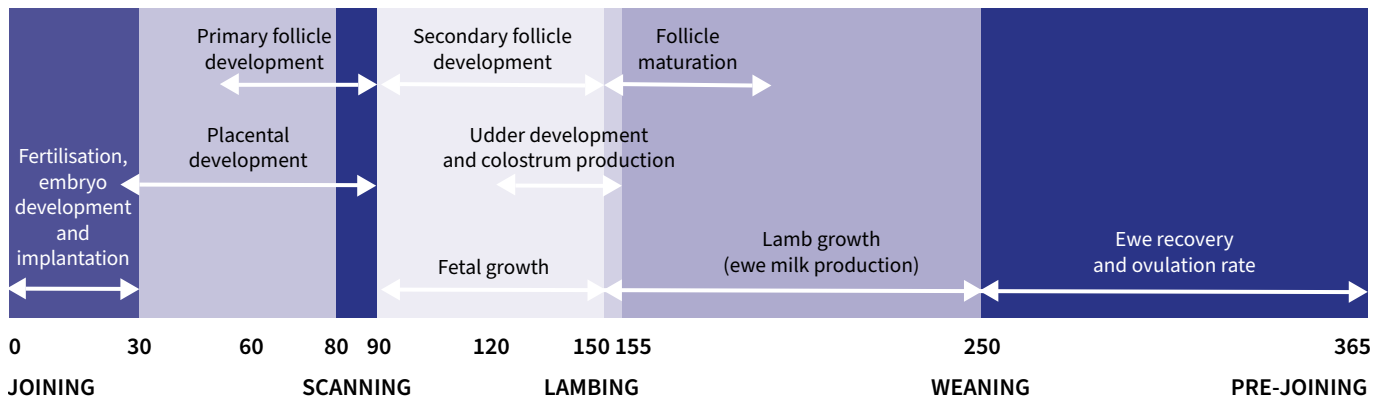
The value of pregnancy scanning

A benefit-cost analysis (BCA) showed that scanning for multiples and implementing optimal management to ewes based on their reproductive status is profitable in all regions and flock types studied, with an average benefit of $5.55 per ewe scanned. Scanning for only pregnancy status (pregnant or empty) returned an average profit of $2.65 per ewe scanned.

The greatest improvement in profit from investing in pregnancy scanning comes from scanning for multiples, removing the passenger ewes and managing the needs of single- and multiple-bearing ewes based on the number of lambs they are carrying. Producers who scan for only pregnancy status often scan for multiples in future years as they become comfortable with the process and can implement improved management of multiples to further improve whole farm profitability.

For a more detailed breakdown on the benefit-cost analysis of pregnancy scanning, read the fact sheet **The value of pregnancy scanning** on page 8.

Pregnancy scanning in practice

Stages of the annual ewe reproductive cycle

	Primary follicle development	Secondary follicle development	Follicle maturation
Fertilisation, embryo development and implantation	Placental development	Udder development and colostrum production	
		Fetal growth	Lamb growth (ewe milk production)	Ewe recovery and ovulation rate

0	30	60	80	90	120	150	155	250	365
JOINING				SCANNING		LAMBING		WEANING	PRE-JOINING

Please note: days of each reproductive stage are approximate and vary by situation.

Source: LifetimeWool, adapted by AWI

When should I scan my ewes?

Pregnancy scanning should be conducted 80–90 days after the rams go in with the ewes, based on current industry recommendations of a five-week joining period. It is strongly recommended that you call and book your scanner the day the rams go in with ewes and ensure adequate labour is available for scanning. Speak with your scanner about your yards and how many people will be required, as well as the best timing for your type of scanning based on your operation.

For joining periods longer than five weeks, scanning can be undertaken across a window of 70–100 days from rams in. However, scanning accuracy will be highest between 80–90 days after the rams go in.

To further increase the accuracy, make sure ewes are held off feed and water for a minimum of six hours before scanning. Producers are encouraged to use the **Ewe scanning and management**

checklist on page 10 for a detailed breakdown of the key timing and activities to get the most accurate scanning result possible.

What infrastructure do I need?

Sheep yards and fencing should be kept in good condition to ensure that any ewes drafted on pregnancy status can remain separated and managed accordingly.

It is important to ensure sufficient labour is available to keep ewes up to the scanning contractor. Depending on the individual setup, up to 3,000 ewes may be scanned in a day.

To improve the reproductive performance of your ewes, differential nutrition should be offered based on scanning results. This can be achieved by preferential paddock allocation and supplementary feeding where required, which will often require consideration for infrastructure planning, e.g. hot wire fencing to split larger paddocks.

Pregnancy scanning in practice

How do I differentially manage my ewes once scanned?

Once scanned, ewes need to be drafted based on scanning results to manage them accordingly.

Ewes scanned empty

Management factors have an impact on ewe conception rate, and it is important to consider these factors when deciding if ewes scanned empty for the first time will be sold or retained. Factors that can be considered include the reproductive rate of the flock, the importance of reproductive performance in your breeding objective, how intensive management has been in the lead up to joining and scanning, the condition score and nutrition of your ewes and rams, ram team fitness for joining, etc. – though this is an individual business decision.

More information for getting the most out of joining

- Making More From Sheep Chapter 10.1 Ensure most ewes get in lamb

- Making More From Sheep Tool 10.6 Ram pre-joining checklist

- Fit to Join ewe assessment tools

Any of the retained, scanned empty ewes can be managed as a separate group until they are put back with the main flock prior to next joining. These ewes have far lower nutritional demands than their pregnant counterparts and can be returned to a maintenance ration.

Ewes scanned empty more than once should be removed from the breeding flock.

Ewes scanned pregnant

Pregnant ewes have different nutritional requirements depending on the number of lambs they are carrying (litter size) and should be fed accordingly to maximise lamb and ewe survival. The value of making this decision is higher when scanning for multiples than for only pregnancy status, as it gives you extra knowledge to make management decisions which further improve ewe and lamb survival.

Scanning for only pregnancy status still provides valuable information to improve management of your ewe flock by identifying the scanned empty ewes and allocating higher quality feed resources and the best lambing paddocks to pregnant ewes.

Multiple-bearing ewes are the highest priority for nutrition during pregnancy and lactation. These ewes have a higher recommended condition score (CS) target at lambing as they have a higher nutritional requirement during lactation.

The biggest risk for single-bearing ewes is dystocia due to overgrown fetuses. It is important to optimise ewe condition in late pregnancy to mitigate this risk by having lambs born in the optimal birthweight range (4.5–5.5 kg).

Pregnancy scanning in practice

## Target condition scores at lambing based on reproductive status

	SINGLE	MULTIPLES
MERINO	CS 3.0	CS 3.3
MATERNAL COMPOSITES		
April lambing	CS 3.1	CS 3.7
June lambing	CS 3.1	CS 3.5
August lambing	CS 3.0	CS 3.4

In late pregnancy (last six weeks), single-bearing ewes need almost 40% more energy and twin-bearing ewes need 76% more energy than empty ewes.

During peak lactation (around 20–30 days after birth), a twin-bearing ewe needs over five megajoules of metabolisable energy per day (MJ ME/day) more than a single-bearing ewe to meet her daily energy intake requirements.

This is why scanning and knowing the reproductive status of your ewes is so important.

Energy required by a 50 kg ewe to maintain CS 3
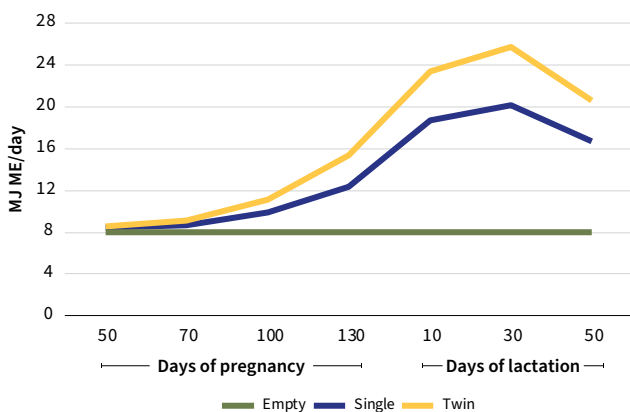
Source: LifetimeWool, adapted by AWI

Paddock allocation

Allocation of better lambing paddocks (including those with more shelter) to multiple-bearing ewes has the potential to increase lamb survival, as lambs born as multiples are more susceptible to exposure extremes than singles. Additionally, reducing mob size at lambing has a greater impact on improving lamb survival in multiple-bearing ewes than single-bearing ewes. The survival of twin-born lambs decreases by between 1.9% and 2.5% per additional 100 ewes in the mob at lambing. As such, identifying litter size at pregnancy scanning can allow mob size to be reduced for multiple-bearing ewes.

Ewes scanned for fetal age

Dividing pregnant ewes into groups based on their expected lambing time can further assist farm management through:

- monitoring of lambing progress to focus on groups when they are in their peak lambing time

- more accurate feeding to match nutritional requirements depending on stage of pregnancy

- optimising lamb marking and weaning times

- improved paddock allocation.

The value of pregnancy scanning

Image: MLA

Pregnancy scanning is an essential tool for improved ewe and lamb survival. The information collected during pregnancy scanning can be used to differentially manage pregnant ewes, providing optimal nutrition and conditions for survival.

Scanning has a high return on investment when the information from scanning is used to make selection decisions and optimise nutrition. A benefit-cost analysis (BCA) has demonstrated that **scanning for multiples returns an average profit of $5.55/ewe**.

Scanning for only pregnancy status was about half as profitable, at $2.65/ewe on average.

Breed type	The value of scanning for multiples ($/ewe)			The value of scanning for pregnancy status ($/ewe)		
	Time of lambing			Time of lambing		
	Autumn	Winter	Spring	Autumn	Winter	Spring
Winter rainfall regions						
Hamilton, VIC region						
Merino	$7.20	$10.60	$3.80	$6.30	$5.70	$1.30
Merino-Terminal	$6.40	$8.80	$6.00	$5.20	$4.10	$0.00
Maternal	$7.50	$8.80	$5.40	$7.10	$7.70	$2.90
Darkan, WA region						
Merino	$7.80	$2.80	$5.50	$4.10	-$1.50	$1.50
Merino-Terminal	$9.80	$5.20	$3.70	$4.60	$0.90	-$1.50
Maternal	$5.80	$4.00	$4.20	$4.80	$3.00	$0.90
Cunderdin, WA region						
Merino	$4.60	$4.60	$1.20	$2.50	$1.20	-$0.30
Merino-Terminal	$5.20	$4.70	$1.90	$2.00	$1.00	-$0.90
Maternal	$8.40	$3.50	$6.50	$7.50	$3.30	$3.00
Summer rainfall region						
	Time of lambing			Time of lambing		
Armidale, NSW region	1-Aug	1-Sep	20-Sep	1-Aug	1-Sep	20-Sep
Merino			$3.85			$1.16
Merino-Terminal		$7.52	$7.06		$1.86	$1.78
Maternal	$2.01	$1.74		$1.64	$1.57	
	Total average value of scanning for multiples		$5.55	**Total average value of scanning for pregnancy status**		$2.65

Scanning for multiples is most valuable

Scanning for multiples and implementing best practice management was profitable across all regions, breeds and times of lambing in the analysis. The average profit was $5.55/head.

In winter rainfall regions, the value of scanning was higher for flocks that were lambing in autumn and slightly less for flocks lambing in spring. This is because the early lambing flocks are scanning and identifying the empty ewes prior to the main feed shortage, which increases the value of adjusting their nutritional management or from selling at scanning.

Scanning was similarly profitable in the summer rainfall region.

The lower value of scanning associated with later lambing does not equate to lower profit overall. Often the later lambing flocks are the most profitable due to the more appropriate allocation of feed to match nutritional requirements.

The value of scanning for pregnancy status

Scanning for pregnancy status was about half as profitable as scanning for multiples. The average return on scanning for pregnancy status was $2.65/head.

Scanning for pregnancy status was not profitable in some regions and flocks where it occurred after the main feed deficit. In these cases, the reproduction and feed benefits achieved were less than the cost outlay for scanning and the reduction in the wool production potential of the flock.

These results suggest that scanning for pregnancy status is a good starting point for farmers who are gaining experience with scanning, but that it should be used as a stepping-stone to scanning for multiples.

Management changes

To capture the benefits of pregnancy scanning, management changes that utilise the information obtained from scanning need to be implemented. Management options include:

- Removing the "passengers" that are scanned empty from your replacement breeding flock to improve future reproductive outcomes
- Optimising the sale time of empty ewes differs between enterprises but options include selling at scanning or after the following shearing
- Reducing nutrition to empty ewes and diverting that feed to pregnant ewes
- Increasing nutrition to multiple-bearing ewes
- Allocating multiple-bearing ewes to better lambing paddocks
- Including birth type when selecting your replacement breeding ewes.

The value of each management option to your enterprise

Management options	Scanning for multiples	Scanning for pregnancy status	$/ewe
Sell the passengers	✓	✓	$1.85
Feed allocation:			
✓ to pregnant ewes	✓	✓	$0.80
✓ to multiples	✓	X	$1.00
Paddock allocation	✓	X	$0.95
Replacement selection	✓	X	$0.95
Total value per ewe	**$5.55**	**$2.65**	

The biggest contributor to the profitability of scanning (for pregnancy status and multiples) is the removal of passenger ewes to increase the subsequent reproductive performance of the flock. In this BCA, it was optimal to sell once-empty ewes for the flocks that are scanning just prior to the main feed deficit, provided that the weaning percentage is sufficient for the flock to be self-replacing. Selling twice-empty ewes was best for flocks that are not self-replacing or are scanning after the feed deficit.

How this BCA was calculated

The cost of scanning includes both the cost of the contractor and the labour cost associated with mustering and pushing the ewes through the scanning crate.

A variety of regions were analysed to be illustrative of different Australian sheep production zones, lambing times, breed types, average annual rainfall and growing season lengths. These are: Hamilton, VIC region (600–650mm winter rainfall zone) with a nine-month growing season; Darkan, WA region (500–600mm winter rainfall zone) with a six-month growing season; Cunderdin, WA region (350–380mm winter rainfall zone) with a four-and-a-half-month growing season; and Armidale, NSW region (750–800mm summer rainfall zone) and a six-month growing season.

Breed type	Description
Merino	Self-replacing Merino flock with emphasis on wool production. Wethers sold as store lambs (six months) or shippers (18 months).
Merino-Terminal	Self-replacing Merino flock, surplus ewes (cast for age or surplus ewe hoggets) for first-cross lamb production sold as suckers (four-and-a-half months). Merino wethers sold as Merino prime lamb or shippers.
Maternal	Composite ewes joined to composite rams to produce composite lambs. Wethers sold as prime lambs (four to five months).

Scan the QR code for more information and resources

Ewe scanning and management checklist

Mob name _____

Rams in date
Date rams go into the paddock with ewes

Rams out date
Recommended joining length is 35 days

Scanning date
80–90 days after rams in

Lambing date
150 days after rams in

Marking date
2–8 weeks after lambing

Weaning date
14 weeks after lambing

Days from rams in	Activity	Action	Comment	
Day -30 (30 days pre-joining)	Check ewes are Fit to Join	Review body condition score (CS) and use Fit to Join ewe assessment	Assess ewe CS against your breed targets and review feed budgets for next 30 days. Determine if ewes are Fit to Join to improve ewe and lamb survival.	☐
Day 0–35 (Joining)	Confirm scanning date	Call to book in your scanner on the day you put your rams in with the ewes and discuss your sheep type, likelihood of singles, twins and triplets (based on prior experience) and best date for scanning	Based on industry recommended five-week joining, scanning should be conducted approximately 80–90 days after the rams go in with the ewes for the best accuracy. The scanning date may be earlier if you're scanning for triplets.	☐
		Ensure adequate labour is available	You will need labour to muster and bring ewes to the yards and keep ewes up to the scanning box on the day of scanning.	☐
Day 50–90	Pre-scanning preparation – in the month before	Ensure the scanner can get good skin contact	Check that ewes are clean of burrs and mud prior to scanning. Poor contact will impact accuracy and slow down the scanner.	☐
		Ensure sheep yards are in good condition	Ensure facilities are in working order so scanning equipment can be integrated into yards and ewes can be drafted based on their pregnancy status.	☐

Days from rams in	Activity	Action	Comment	
Day 80–90	Pre-scanning preparation – the day before	Ensure ewes are held off feed and water for a minimum of six hours prior to scanning	Reducing gut fill will improve accuracy of scanning. Ensure ewes have access to shade and shelter during this time off feed.	☐
		Confirm labour availability	Depending on the individual set up, up to 3,000 ewes may be scanned in a day.	☐
	Post-scanning ewe management	Determine CS of ewes whilst in the yards post-scanning	This is an ideal opportunity to review ewe condition as their nutritional requirements start to increase. Target ewe CS and review nutritional management in the lead up to lambing. It is important to manage according to CS and pregnancy scanning status.	☐
	Mob preparation and differential management	Identify and allocate lambing paddocks based on pregnancy scanning results	Consider the availability and quality of feed and shelter. As well as past paddock performance data (if you have it), then you can give the paddock that perform best for lamb survival to multiple-bearing ewes. Make a plan for when you will move ewes into their lambing paddocks.	☐
Day 90–150	Manage ewes based on reproductive status	Make decision about scanned empty ewes	All empty ewes should be placed on a maintenance ration. Permanently identify scanned empty ewes. Management decisions need to be made for empty ewes. Management factors may have impacted on conception for ewes scanned empty the first time, which can be taken into consideration when deciding if these animals will be sold or retained. Ewes scanned empty more than once should be removed from the breeding flock.	☐
		Differentially manage nutrition based on pregnancy status	From scanning, separate mobs based on scanning results. Complete feed budgeting to ensure ewes will meet target CS at lambing and allocate paddocks accordingly.	☐
		Supplementary feed to help meet requirements	Feed needs for different management groups – use MMFS Tool 11.1 Energy and protein requirements of sheep.	☐

The industry recommendation of scanning 80–90 days from rams in is based on the industry recommendation of a 35 day (five week) joining period and consolidated feedback from advisors, veterinarians and pregnancy scanners across Australia. You should speak with your pregnancy scanner to work out the timing that best suits your operation to get the optimal result for your property.

Management of sheep in the first 100 days of life is vital, and there are many industry resources to assist you in optimising this period of your sheep's life.

Scan the QR code for more information and resources

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Resource guide
for sheep reproduction

Image courtesy of AWI

About this guide

This handy collection of AWI and MLA resources, tools and workshops provides producers and advisors with key information for all stages of the sheep reproduction cycle.

The resources are split into four topics to make them easier to find:

1. Reproduction

2. Sheep health

3. Feedbase & nutrition

4. Breeding & selection

Many of the resources are available to download directly by clicking on their title or scanning the QR code, but most can also be ordered by contacting AWI or MLA via the details below:

Australian Wool Innovation
02 8295 3100
info@wool.com
Level 3, 24 York St SYDNEY NSW 2000

Meat & Livestock Australia
1800 023 100
info@mla.com.au
Level 1, 40 Mount St NORTH SYDNEY NSW 2060

Contents

Resource type

Podcast

Video or webinar

Book or PDF

Website

Tool

App

eLearning

Face-to-face workshop

Reproduction

RESOURCE		ACCESSED THROUGH	RESOURCE TYPE

Productivity and Profitability series
This series of podcasts presents new and topical information to help producers increase the success of their businesses.
Accessed through: mla — MEAT & LIVESTOCK AUSTRALIA. Resource type: podcast

The Yarn
A series of podcasts covering many seasonal topics across sheep production and the wool supply chain.
Accessed through: AWI Australian Wool Innovation Limited. Resource type: podcast

AWI Change Makers
A seven-part video series centred around sheep reproduction. Tune in to hear a range of practical ways growers can influence sheep reproduction with the latest research and tools informed by the AWI-funded research and development outcomes.
*Accessed through: AWI Australian Wool Innovation Limited. Resource type: video*

Productivity and Profitability series
This series of webinars presents new and topical information to help producers increase the success of their businesses.
*Accessed through: mla — MEAT & LIVESTOCK AUSTRALIA. Resource type: video*

Joining ewe lambs decision support tool
A fact sheet explaining how to use the Joining Ewe Lambs decision support tool. The tool helps to inform the adoption of the practice within their business and optimise management strategies when ewe lambs are being joined.
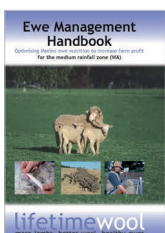*Accessed through: mla — MEAT & LIVESTOCK AUSTRALIA. Resource type: document*
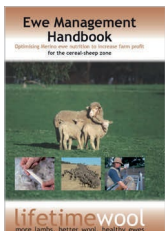
LifetimeWool Ewe management handbook – cereal-sheep zone
The interactions between pasture growth patterns, stocking rate, time of lambing and production are complex. The guidelines outlined in these handbooks give wool producers an optimum strategy for managing ewes 'year in, year out' to maximise production, ensure healthy ewes and deliver efficient feed allocation.
Accessed through: AWI Australian Wool Innovation Limited. Resource type: document
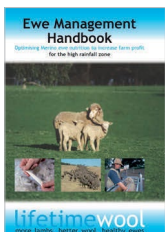
LifetimeWool Ewe management handbook – high rainfall zone
The interactions between pasture growth patterns, stocking rate, time of lambing and production are complex. The guidelines outlined in these handbooks give wool producers an optimum strategy for managing ewes 'year in, year out' to maximise production, ensure healthy ewes and deliver efficient feed allocation.
Accessed through: AWI Australian Wool Innovation Limited. Resource type: document

LifetimeWool Ewe management handbook – medium rainfall WA
The interactions between pasture growth patterns, stocking rate, time of lambing and production are complex. The guidelines outlined in these handbooks give wool producers an optimum strategy for managing ewes 'year in, year out' to maximise production, ensure healthy ewes and deliver efficient feed allocation.
Accessed through: AWI Australian Wool Innovation Limited. Resource type: document

Reproduction

RESOURCE	ACCESSED THROUGH	RESOURCE TYPE

LifetimeWool Ewe management handbook – southern slopes NSW and north central Victoria
The interactions between pasture growth patterns, stocking rate, time of lambing and production are complex. The guidelines outlined in these handbooks give wool producers an optimum strategy for managing ewes 'year in, year out' to maximise production, ensure healthy ewes and deliver efficient feed allocation.
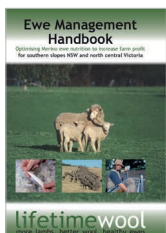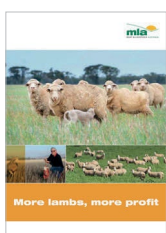
Australian Wool Innovation Limited

Managing breeding ewes in containment areas
This guide for producers details how to successfully maintain breeding ewes in containment to cost-effectively achieve high sheep welfare and optimal lamb marking rates.

mla MEAT & LIVESTOCK AUSTRALIA

More lambs, more profit
Reproductive efficiency is important to the profitability of all sheep flocks and this booklet brings together a complete set of 'best-practice' management strategies to improve sheep reproduction.

mla MEAT & LIVESTOCK AUSTRALIA
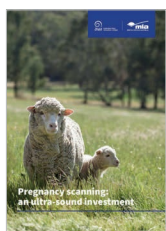
Pregnancy scanning – an ultra-sound investment
Do you want to get the most out of your scanning results? Not yet scanning and want to know what all the fuss is about? This resource contains the most up-to-date benefit-cost analysis (BCA) for pregnancy scanning and a checklist to keep on track with key dates and opportunities in the reproduction calendar.
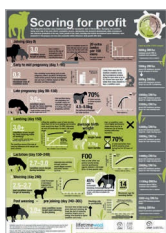
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Scoring for profit
A poster detailing the condition score (CS) and feed on offer (FOO) targets for single- and twin-bearing ewes throughout the reproductive cycle.

Australian Wool Innovation Limited
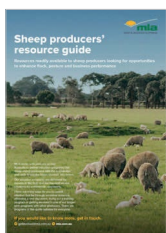
Sheep producers' resource guide
MLA resources readily available to sheep producers looking for opportunities to enhance flock, pasture and business performance.

mla MEAT & LIVESTOCK AUSTRALIA

Reproduction

RESOURCE	ACCESSED THROUGH	RESOURCE TYPE

The value of pregnancy scanning
The results are in! Pregnancy scanning is an essential tool for improved ewe and lamb survival. Scanning has a high return on investment when the information from scanning is used to make selection decisions and optimise nutrition. A benefit-cost analysis (BCA) has demonstrated that scanning for multiples returns an average profit of $5.55/ewe and scanning for only pregnancy status returns $2.65/ewe.

AWI Australian Wool Innovation Limited
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Tips & Tools: 45 x 7 Joining ewe lambs for more profit
Crossbred ewe lambs can be successfully joined at 7–9 months of age if they achieve a minimum live weight of 45 kg. This can significantly reduce the cost of growing out replacement ewes. Ewe genetics, nutrition and management are essential factors to focus on if you wish to maximise breeding success.

mla MEAT & LIVESTOCK AUSTRALIA

LifetimeWool Regional guidelines
A series of guidelines and recommendations for managing ewe flocks throughout the year.

AWI Australian Wool Innovation Limited

MMFS Module 8 Turn Pasture into Product
Understanding and increasing the amount of pasture that is available to drive an animal production enterprise and your tactics and strategies for matching feed supply to animal demand, managing any consequences and exploring opportunities when feed supply does not match enterprise demand.

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MMFS Module 10 Wean More Lambs
A framework and guidelines to set the important management steps to improve flock reproduction rates and lamb survival to weaning, enabling enterprise profits to be increased by 10-15% per ewe in flocks that are managed to appropriate condition score targets, on top of returns that can be made from optimising stocking rate.

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AWI Management calendar
A template to map out your annual operations and assist in planning and managing your enterprise.

AWI Australian Wool Innovation Limited

Ewe scanning and management checklist
An easy-to-use checklist for ewe scanning and management from joining to lambing, including tips and tricks for getting the most out of your scanner.

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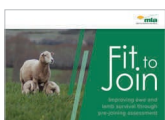
Fit to join
This guide outlines the benefits of assessing ewes before joining and guides you through the process of assessing ewes effectively and efficiently.

mla MEAT & LIVESTOCK AUSTRALIA

Reproduction

RESOURCE		ACCESSED THROUGH	RESOURCE TYPE

Joining ewe lambs decision support tool
This tool allows sheep producers to assess the economic outcome of joining ewe lambs to inform the adoption of the practice within their business and optimise management strategies when ewe lambs are being joined.

Lambing Planner
This tool provides a systematic basis for planning the management calendar for the breeding flock. The Lambing Planner is available as a hard copy or can be downloaded as an app.

Lifetime Ewe Management LTEM app
Assists sheep producers to proactively manage the nutrition of their ewe flock through the reproduction cycle utilising condition scoring and feed on offer (FOO) assessments.
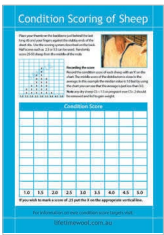
LifetimeWool Condition scoring sheep
Use this handy guide to calibrate your understanding of condition scoring (CS) with descriptions of the feel of CS 1-5 and record the results for your mob.

RAMping Up Repro Checklist for pre-joining
Perform pre-joining checks 8-12 weeks prior to joining to ensure your ram team is fit and healthy before heading to the joining paddock.

RAMping Up Repro scrotal tape
A tape to measure the scrotal circumference of your rams to identify if they are within the normal range based on their age.

Weaner management checklist
Contains a checklist of the key management practices and targets for a thriving weaner mob. The checklist allows you to enter key weights and dates for your operation to customise the information for your flock.

Reproduction

RESOURCE	ACCESSED THROUGH	RESOURCE TYPE

MMFS Module 8 Turn Pasture into Product
This module is about getting the best alignment between animal demand and pasture supply so as much pasture as possible ends up as animal product, without jeopardising the feedbase or natural resources. Increases in pasture utilisation must be made in ways that not only increase animal production but also reduce costs and account for natural resource management risks.

Accessed through: Australian Wool Innovation Limited, Meat & Livestock Australia

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MMFS Module 10 Wean More Lambs
This module outlines the important management steps to improve flock reproduction rates and lamb survival to weaning.

Accessed through: Australian Wool Innovation Limited, Meat & Livestock Australia

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Lifting Lamb Survival
This PGS package is delivered as a mix of workshops and on-farm coaching to assist you in building your own plan to improve lamb survival within your business. The first step is knowing where you have come from, then knowing your potential, and identifying your opportunities for improvement.

Accessed through: Meat & Livestock Australia

RAMping Up Repro™
Hands-on workshop focused on improving ram performance and working longevity in commercial sheep enterprises. The workshop is designed increase the skill of producers across the key components of ram performance and impacts on overall breeding enterprise performance, including anatomy, physiology, spermatogenesis, metabolic demands, health, disease & biosecurity and the financial impact of the ram team.

Accessed through: Australian Wool Innovation Limited

Winning With Weaners™
Designed for woolgrowers and is aimed at improving weaner management of their Merino flock, targeting 95% weaner survival to one year of age. WWW identifies key practical actions and tools for commercial enterprises to implement on farm to achieve this performance aim.

Accessed through: Australian Wool Innovation Limited

Lifetime Ewe Management (LTEM)
The course is delivered in small groups of 5-7 sheep producers that meet six times per year with a professional trainer. During these hands-on sessions, the group visits each participating farm and learns skills in condition scoring, pasture assessment and best practice ewe and lamb management to increase reproduction efficiency and wool production, mainly through reducing ewe and lamb mortality.
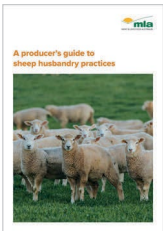
Accessed through: Australian Wool Innovation Limited

Sheep health

RESOURCE		ACCESSED THROUGH	RESOURCE TYPE

Productivity and Profitability series
This series of webinars and podcasts presents new and topical information to help producers increase the success of their businesses.

mla MEAT & LIVESTOCK AUSTRALIA

A producer's guide to sheep husbandry practices
The aim of this booklet is to describe best-practice techniques for a number of husbandry skills required when managing sheep.

mla MEAT & LIVESTOCK AUSTRALIA

Anaesthetics and analgesics at lamb marking
This fact sheet provides an overview of the available pain relief products for use in sheep and which animal husbandry operations they are suitable for.

awi Australian Wool Innovation Limited

Improving internal parasite control in sheep with nutrition
This fact sheet provides a summary on using nutritional management to control internal parasites in sheep.

mla MEAT & LIVESTOCK AUSTRALIA

Is the animal fit to load?
A national guide to the pre-transport selection and management of livestock.

mla MEAT & LIVESTOCK AUSTRALIA

Low-worm risk pastures for sheep
An important part of an integrated approach to parasite management in sheep and are especially important for lambing ewes, weaners and prime lambs being finish for sale. This fact sheet outlines several different ways of preparing low-risk worm paddocks for sheep.

mla MEAT & LIVESTOCK AUSTRALIA

Pain mitigation in sheep
This fact sheet outlines best practice recommendations for specific husbandry practices for sheep, and considerations for alternatives of some of these practices.

mla MEAT & LIVESTOCK AUSTRALIA

Sheep health

RESOURCE	ACCESSED THROUGH	RESOURCE TYPE

Plan, prepare and conduct best welfare practice lamb marking procedures
Details the preparation and planning, marking and mulesing equipment, chemical and animal health product use and mulesing procedures that meet the welfare standards in the Code of Practice for the Welfare of Animals.

Accessed through: AWI Australian Wool Innovation Limited — *Resource type:* reading

Targeted drenching of adult ewes
This fact sheet provides a summary of internal parasite control for sheep in southern Australia, where targeted drenching of adult ewes can reduce drench use by between 48–58%.

Accessed through: mla MEAT & LIVESTOCK AUSTRALIA — *Resource type:* reading

Vaccination in sheep flocks
This fact sheet provides information and background on vaccines, vaccine handling and a provides a guide to decision making for livestock vaccination programs.

Accessed through: mla MEAT & LIVESTOCK AUSTRALIA — *Resource type:* reading

Worm control in southern prime lamb production systems
This fact sheet provides a summary of worm control practices for prime lamb production systems in southern Australia.

Accessed through: mla MEAT & LIVESTOCK AUSTRALIA — *Resource type:* reading

MMFS Module 11 Healthy and Contented Sheep
An effective approach to managing the health and welfare of your flock in a cost-effective manner to maximise enterprise profitability by implementing effective health management programs, taking a proactive approach to sheep health and welfare, having healthy sheep that are exposed to fewer chemicals and adopting strategies that minimise chemical use and delay development of chemical resistance by sheep parasites.

Accessed through: AWI Australian Wool Innovation Limited; mla MEAT & LIVESTOCK AUSTRALIA — *Resource type:* online

ParaBoss
A national information hub for advice on managing internal and external parasites across Australia. Relevant information for sheep is contained under its WormBoss, FlyBoss and LiceBoss programs.

Accessed through: AWI Australian Wool Innovation Limited; mla MEAT & LIVESTOCK AUSTRALIA — *Resource type:* online

Sheep health

| RESOURCE		ACCESSED THROUGH	RESOURCE TYPE
ParaBoss A myriad of tools to assist in managing internal and external parasites in different environments across Australia. Relevant information for sheep is contained under its WormBoss, FlyBoss and LiceBoss programs.		Australian Wool Innovation Limited / mla MEAT & LIVESTOCK AUSTRALIA	
Sheep health tool Assess the physical and financial impacts of common endemic diseases of sheep to your flock and business.		mla MEAT & LIVESTOCK AUSTRALIA	
MMFS Module 11 Healthy and Contented Sheep This module outlines the importance of managing the health and welfare of your flock. This module also outlines how to manage sheep parasites and diseases in a cost-effective manner to maximise enterprise profitability.		Australian Wool Innovation Limited / mla MEAT & LIVESTOCK AUSTRALIA	
Pain relief use in sheep The provision of pain relief with routine husbandry practices is now an expectation, and producers need to consider the use of pain relief products in their animals, but also alternate husbandry procedures and management practices. This module outlines available products, their costs and when they are suitable to use, as well as best practice recommendations for specific husbandry practices, and considerations for alternatives to some current husbandry practices.		mla MEAT & LIVESTOCK AUSTRALIA	
Vaccination in sheep flocks This module outlines the different types of vaccines, how to store and handle vaccines, why you should consider vaccinating, common sheep diseases and the vaccines currently available for sheep in Australia.		mla MEAT & LIVESTOCK AUSTRALIA	

Feedbase & nutrition

Productivity and Profitability series
This series of webinars and podcasts presents new and topical information to help producers increase the success of their businesses.
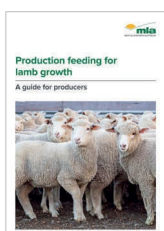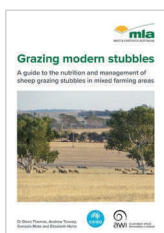
Production feeding for lamb growth
This guide provides information on the most important aspects of intensive lamb finishing, specifically related to growth.
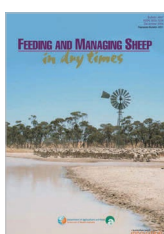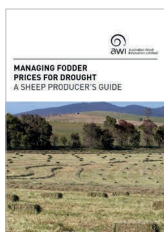
Feeding and managing sheep in dry times
A practical guide for farmers finishing lambs, feeding due to drought, designing a feedlot and much more.

Grazing modern stubbles
A guide to the nutrition and management of sheep grazing stubbles in mixed farming areas

Managing fodder price for drought
Preparation for, and successful management during, a drought not only requires a sound knowledge of the amount and type of feed you'll need, but also forward planning and decision-making on how much fodder will be stored in advance on-farm and fodder buying strategies during a drought.
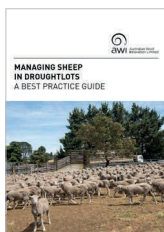
Managing sheep in droughtlots
This publication aims to highlight the purpose, benefits and experiences of sheep producers managing sheep in containment areas during drought.

Releasing sheep from containment feeding
AWI's resource on managing the transition from containment areas to pasture to minimise the risk of animal health issues, as well as ensuring that wool quality is not affected.
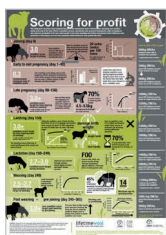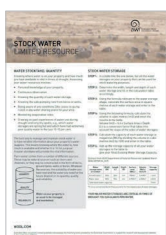
Feedbase & nutrition

RESOURCE	ACCESSED THROUGH	RESOURCE TYPE

Scoring for profit
A poster detailing the condition score (CS) and feed on offer (FOO) targets for single- and twin-bearing ewes throughout the reproductive cycle.

Australian Wool Innovation Limited

Stock water – a limited resource
Details for performing a water audit on your property by assessing water quantity, quality and reliability.

Australian Wool Innovation Limited

Tips & Tools: Improving pasture use with the MLA Pasture Ruler
This fact sheet explains how to use the MLA Pasture Ruler. The Pasture Ruler provides the basis for a quick and easy way to estimate pasture mass (quantity) and quality. These estimates become a guide to the performance you can expect from your grazing animals.

Meat & Livestock Australia

MMFS Module 7 Grow More Pasture
The productivity and profitability of many grazing enterprises in the high rainfall and sheep-wheat zones of Australia can be greatly improved by increasing the amount of pasture grown. The quantity and quality of pasture, and when it can be grown, underpins strategic decisions such as time of lambing, flock structure, stocking rates and target markets.

Australian Wool Innovation Limited
Meat & Livestock Australia

Feedbase planning and budgeting tool
Plan rotational grazing systems, determine appropriate stocking rates, determine how long your paddocks will last and calculate the most economical ration for your stock.

Meat & Livestock Australia

Feed budget tables for Merino weaners
Feed budget tables for Merino weaners, including how to calculate target weaning weight (TWW) for your flock, weaner liveweight targets at various ages and feeding requirements.

Australian Wool Innovation Limited

Feed on Offer (FOO) Library
The FOO Library allows users to estimate FOO and nutritive value of their pastures based on a series of pasture samples that have been photographed, cut, collected, tested and analysed. While it's not possible to have records for every pasture in every location, you should be able to find pastures that are similar to those on your farm.
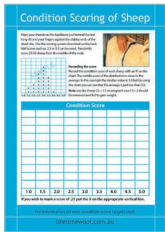
Australian Wool Innovation Limited
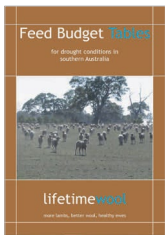
Feedbase & nutrition

| RESOURCE		ACCESSED THROUGH	RESOURCE TYPE

LifetimeWool Condition scoring sheep
Use this handy guide to calibrate your understanding of condition scoring (CS) with descriptions of the feel of CS 1-5 and record the results for your mob.

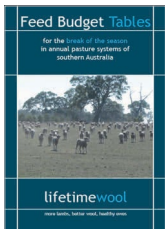AWI Australian Wool Innovation Limited

LifetimeWool Feed budget tables for drought conditions in southern Australia
View feed budget tables based on feed on offer (FOO) for annual clover-based pastures and mixed perennial and annual pastures.

AWI Australian Wool Innovation Limited
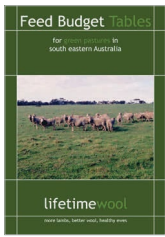
LifetimeWool Feed budget tables for green pastures in south eastern Australia
View feed budget tables based on feed on offer (FOO) for annual clover-based pastures and mixed perennial and annual pastures.

AWI Australian Wool Innovation Limited

LifetimeWool Feed budget tables for the break of the season in annual pasture systems of southern Australia
View feed budget tables based on feed on offer (FOO) for annual clover-based pastures and mixed perennial and annual pastures.

AWI Australian Wool Innovation Limited

MLA Pasture Ruler
A basis for a quick and easy way to estimate pasture mass in kilograms dry matter per hectare (kg DM/ha). Also available is the pasture ruler Tips & Tools which shows you how to use the ruler.

mla MEAT & LIVESTOCK AUSTRALIA
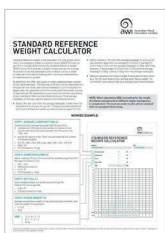
Standard reference weight calculator
Determining the standard reference weight (SRW) of your flock provides a useful comparison across a range of animals of varying liveweights and condition scores in order to make decisions about meeting their nutritional requirements for maintenance or growth.

AWI Australian Wool Innovation Limited

Stocking rate calculator
Determine the number of cattle or sheep you should put into a paddock based on its carrying capacity.

mla MEAT & LIVESTOCK AUSTRALIA

Feedbase & nutrition

RESOURCE	ACCESSED THROUGH	RESOURCE TYPE

Lifetime Ewe Management LTEM app
Assists sheep producers to proactively manage the nutrition of their ewe flock through the reproduction cycle utilising condition scoring and feed on offer (FOO) assessments.

Accessed through: AWI Australian Wool Innovation Limited

MMFS Module 7 Grow More Pasture
This module contains three topics designed to help sheep producers grow more and better-quality pastures. Getting these procedures right will allow them to make best use of their farm's physical resources such as rainfall, sunlight and soil type.

Accessed through: AWI Australian Wool Innovation Limited; mla Meat & Livestock Australia

Lifetime Ewe Management (LTEM)
The course is delivered in small groups of 5-7 sheep producers that meet six times per year with a professional trainer. During these hands-on sessions, the group visits each participating farm and learns skills in condition scoring, pasture assessment and best practice ewe and lamb management to increase reproduction efficiency and wool production, mainly through reducing ewe and lamb mortality.

Accessed through: AWI Australian Wool Innovation Limited

BredWell FedWell
A practical, one-day workshop highlighting the key production benefits of superior genetics, plus feed management for improved reproductive performance and livestock productivity.

Accessed through: mla Meat & Livestock Australia

Grass to Dollars
This PGS package assists producers in assessing pastures grown across southern Australia, condition scoring livestock, managing pasture grazing and optimising pasture utilisation.

Accessed through: mla Meat & Livestock Australia

Breeding & selection

RESOURCE		ACCESSED THROUGH	RESOURCE TYPE

Productivity and Profitability series
This series of webinars and podcasts presents new and topical information to help producers increase the success of their businesses.

Accessed through: mla – MEAT & LIVESTOCK AUSTRALIA

How to shop for a high-performing sire
This booklet is designed to help you prepare carefully, choose wisely and care for this profit-maker once you get him home, providing a guide of what to do before, at and after the sale.

Accessed through: mla – MEAT & LIVESTOCK AUSTRALIA

Making the most of mutton
Understand the processor specifications for a range of mutton products and be able to calculate how to optimise income from the mutton products produced on farm through developing skills in live animal assessment.

Accessed through: mla – MEAT & LIVESTOCK AUSTRALIA
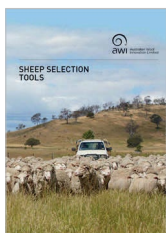
Sheep selection tools
To breed sheep that produce a lot of wool and lambs takes a combination of stockmanship and access to the latest available science and information, and there are a wide range of tools are available for breeders to achieve their breeding goals.

Accessed through: AWI – Australian Wool Innovation Limited
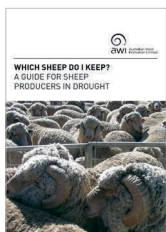
Which sheep do I keep?
When confronted with a pasture shortage, you must determine whether to sell or supplementary feed all, some, or none of their flock. As each drought or feeding period brings its own unique circumstances, a disciplined approach to working out the best strategy at the time is essential.

Accessed through: AWI – Australian Wool Innovation Limited

MMFS Module 9 Boost Business with Breeding
Sheep breeding, in combination with good management and nutrition, provides an important opportunity for producers to optimise returns from their livestock production enterprises.

Accessed through: AWI – Australian Wool Innovation Limited; mla – MEAT & LIVESTOCK AUSTRALIA

Sheep Genetics
Sheep Genetics is the genetic evaluation service of the Australian sheep industry. Sheep Genetics help you breed or buy animals using Australian Sheep Breeding Values (ASBVs) through LAMBPLAN and MERINOSELECT and produce tools and information to help you breed better animals.

Accessed through: mla – MEAT & LIVESTOCK AUSTRALIA

Visual Sheep Scores Guide
Designed to provide a common language for visually assessed traits and a standard method of scoring and recording those traits.

Accessed through: AWI – Australian Wool Innovation Limited; mla – MEAT & LIVESTOCK AUSTRALIA

Breeding & selection

RESOURCE	ACCESSED THROUGH	RESOURCE TYPE

Introduction to Sheep Genetics
This module provides a brief overview of the requirements and processes involved in getting started with Sheep Genetics. Gain an understanding of key requirements of the genetic evaluation and use the learning to collect trait data of interest relevant to your breeding objective.

How to shop for a high-performing ram
This eLearning module will assist you in selecting your next high-performing ram– factoring in what you can and can't see. It provides you with a guide of what to do before, at and after the sale.

Introduction to MateSel
MateSel does the selection and allocation in your flock. It is designed to aid in balancing genetic gain and genetic diversity by optimising mate selections for given male and female candidates. The Sheep Genetics MateSel utilises pedigree and ASBV information. This learning package will take you through the key things to know before starting to use MateSel.

MMFS Module 9 Boost Business with Breeding
This module provides producers access a range of breeding tools to help them breed animals that are fit for purpose, while introducing them to the concept of breeding objectives and animal selection.

BredWell FedWell
A practical, one-day workshop highlighting the key production benefits of superior genetics, plus feed management for improved reproductive performance and livestock productivity.

Lifting Lamb Survival
This PGS package is delivered as a mix of workshops and on-farm coaching to assist you in building your own plan to improve lamb survival within your business. The first step is knowing where you have come from, then knowing your potential, and identifying your opportunities for improvement.

Picking Performer Ewes™
Assists the commercial self-replacing Merino production sector in recognising and placing importance on the total lifetime productivity potential and value of their Merino ewes (fleece, meat and surplus stock) and identifying 'passengers vs. performers'.

If you would like to order any of these resources
in hard copy, please contact:

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Meat & Livestock Australia
1800 023 100
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makingmorefromsheep.com.au/resources