Final report

PDS: Lotsa Lambs – Improving Reproduction Success

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Abstract

The profitability of sheep enterprises in Australia is declining *(Ashton et al, 2024*). Improving productivity from the existing ewe base through maximising reproductive efficiency and minimising mortality will improve production outcomes and long-term profitability.

Four sites in the Upper North Agricultural District of South Australia demonstrated the use of pregnancy scanning ewes in containment for foetus number, condition scoring and targeted feeding based on foetus number to increase lamb survival rates over one lambing cycle. An 8% increase in lamb marking was achieved compared with historic lambing results before twin and single bearing ewes were managed selectively in containment.

In addition, two sites demonstrated lambing multiples in smaller mobs over three lambing cycles. Twin-bearing ewes in mobs of 100 or fewer during lambing reduces the risks of mismothering, ewe-lamb separations, and lamb mortality. The average increase in lambing marking over the 3-year PDS project from the adoption of reduced mob size at lambing for multiple bearing ewes was 8% compared with historical lambing results.

This Upper North Farming Systems project, through workshops and extension material, also increased producer understanding of the impact of genetic selection on reproduction, including the use of selection tools such as Australian Sheep Breeding Values (ASBVs), the RamSelect app and Merino Flock Profiling.

Executive summary

Background

To ensure the long-term profitability and productivity of the Australian sheep industry, it is crucial to maximize flock production efficiency by improving reproductive efficiency and minimizing mortality. Seasonal conditions in the Mid-Upper North Agricultural Districts of South Australia have led many producers to aim for autumn lambing to maximize feed availability for lambs. However, this period poses a high risk due to low feed availability and quality, necessitating careful management of pregnant ewes through paddock or confinement feeding.

Research indicates that managing ewes pregnant with twins can result in progeny performance like single-born lambs when managed under similar targets. Reducing mob size without altering stocking rates has been shown to improve twin-born lamb survival. Despite awareness of these strategies, many producers struggle to implement them, especially in mixed farming systems with larger paddock sizes. Demonstrations and on-ground solutions are needed to help producers adopt these practices effectively.

Additionally, the project aimed to enhance producers' knowledge and use of genetic and maternal health management tools to improve lamb survival. With increasing attention on reproductive wastage due to animal welfare and economic concerns, breeders seek viable options, including genetic improvements, despite slow progress predictions. The demonstration results will provide local knowledge and best practice strategies for improving reproductive performance in sheep flocks in the Upper North Agricultural District of South Australia.

Objectives

This project aimed to demonstrate that the adoption of best practice management strategies including pregnancy scanning for multiples and early and late bearing ewes, selective management of pregnant ewes in containment, smaller mob size at lambing for twin bearers and genetic selection, can improve reproductive performance of sheep flocks in the Upper North of South Australia.

The project objectives were achieved successfully with participants increasing their overall knowledge, skills and overall confidence and final surveys showing an increase in participant’s adoption of practices aimed at improving reproductive performance. There was an overall increase in lambing marking compared with historical lambing across all sites.

Methodology

Two sites were provided by Upper North producers to demonstrate the implementation of pregnancy scanning and lambing multiples in smaller mobs over three lambing cycles.

Four sites demonstrated the use of pregnancy scanning ewes in containment for foetus number, as well as the use of condition scoring, and targeted feeding based on foetus number to increase lamb survival rates over one lambing cycle.

All producers worked alongside a livestock consultant to guide implementation of PDS demonstration practices

The extension and communication activities were held to enable producers to learn from the PDS project. Sessions were designed to suit producer needs providing opportunities to engage with livestock technical experts and researchers, practice skills such as condition scoring and feed budgeting, as well as engaging in peer-to-peer learning.

Results/key findings

- Lamb survival percentage increased by an average of 8% compared to historical averages. This was associated with better overall management of ewes over the three years.
- Knowledge, skills and practice change increased over the project in both core and observer producers in recommended management practices.
- Local producer groups and peer-to-peer discussions with access to researchers and technical experts lead to improved learning and adoption.
- Measuring and monitoring condition scoring is important for achieving improved lamb survival as well as general animal health.
- Pregnancy scanning is essential for splitting ewes into better management groups and for future management decisions.
- The economic analysis showed an average $3.95 net benefit per ewe joined for selective management of multiple bearing ewes in containment and average $1.80 net benefit per ewe joined for running multiple bearing ewes in smaller mobs.
- Four core producers and 18 observer producers were involved in the project
- A total of nine extension activities were delivered with a total attendance of 310
- 26 communication outputs were delivered to UNFS members and the wider farming community.

Benefits to industry

Over the three-year project, there has been an increase in knowledge and adoption of best practice management strategies including pregnancy scanning for multiples and early/lates, selective management of pregnant ewes in containment, smaller mob sizes at lambing for twin bearing ewes and the use of genetic selection tools.

The reproductive performance and profitability of sheep flocks in the Upper North of South Australia can be improved with more effective overall management of ewes during pregnancy and at lambing.

Future research and recommendations

Supported peer to peer learning on farm leads to increased confidence and skills and adoption of management practices.

Control flocks would give a direct comparison rather than relying on historical data for analysing the results of the demonstration sites.

Alternative grazing strategies, fodder crops and feed sources could be investigated to bridge the feed gap during summer/autumn for pregnant ewes in the Upper North.

Investigate the concept of high condition score ewes at lambing having better lamb survival, and those lambs having a higher lifetime fleece value.

PDS key data summary table

Project Aim:
This project will aim to demonstrate that the adoption of best practice management strategies including pregnancy scanning for multiples and early/late, selective management of pregnant ewes in containment, smaller mob size at lambing for twin bearers and genetic selection, can improve reproductive performance of sheep flocks in the Upper North of South Australia.

	Comments	Change/Score	Unit
Production efficiency benefit (impact) Reproductive efficiency – marking %	*Containment sites* *Smaller mob's sites*	8 15	%
Reduction in expenditure Reduction in labour i.e. DSE/FTE, LSU/FTE, AE/FTE; Reduction in other expenditure	i.e. reduction in labour	0	
Increase in income			
Additional costs (to achieve benefits)			
Net $ benefit (impact)	Containment sites Smaller mob's sites	**$3.95** **$10.79**	**$/ewe joined**
Number of core participants engaged in project		4	People
Number of observer participants engaged in project		18	People
Core group no. ha		5,030	ha
Observer group no. ha		58,776	ha
Core group no. sheep		7,950	hd sheep
Observer group no. sheep		45,620	hd sheep
Core group no. cattle			hd cattle
Observer group no. cattle			hd cattle
% participants increase in skills	*Condition scoring*	32	%
% participants increase in skills	*Understanding of Merino Flock Profiling*	79	%
% participants increase in skills	*Understanding of feed budgeting of pregnant ewes in containment*	21	%
% participants increase in skills	Understanding of ASBV's	68	%
% practice change adoption – core	*pregnancy scanning ewes in containment for foetus number, condition scoring, & targeted feeding*	100	%

Key impact data	
Net $ benefit /ewe joined from containment feeding	**$3.62/ewe**
Net $ benefit /ewe joined from split mobs at lambing	**$10.79/ewe**

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1 Background

1.1 Upper North Farming Systems

Formed in 2001, the Upper North Farming Systems (UNFS) group conducts research, and development trials and provides extension and networking opportunities for farmers, agronomists, researchers and primary industry. UNFS covers a diverse geographical area in the Upper North region of South Australia, bordered to the north and east by the pastoral zones and extending south to the higher rainfall zones, and encompasses the towns of Booleroo Centre, Crystal Brook, Hallett, Jamestown, Laura, Peterborough, Nelshaby, Orroroo, Quorn and Wilmington. It's 250 members have a range of enterprises, dominated by cereal-sheep-legume rotations. Members are committed to improving enterprise sustainability, profitability, and viability in a low-medium rainfall environment. UNFS is managed by three part time staff, a Strategic Board of ten and an operations committee of 22. UNFS have a Strategic Plan, Policies and Procedures for project, financial and communication management. The group partners with commercial and private agronomists, livestock consultants and natural resource managers to identify and deliver appropriate and effective projects across the region in all aspects of agriculture. Projects and reports are available on the website www.unfs.com.au.

1.2 Improving reproduction / lamb survival in Upper North sheep flocks

Seasonal conditions and mixed farming systems have led to many producers aiming for an autumn lambing to maximise feed available to lambs due to shorter springs and extended low feed on offer due to extended summer conditions. This is resulting in ewe pregnancy occurring during the period with lowest feed on offer for the district, and high reliance on crop residues.

Many producers have adopted the strategy of feeding ewes in containment over summer and early autumn, often through much of their pregnancy. Once stubbles are depleted feed on offer is limited and early supplementation of hay or grain is necessary to maintain condition score in the ewes. Common practice for a Nov-Dec joining is a 7-8 week joining period, and a lack of pregnancy scanning locally results in significant variation in nutritional requirements of the ewes at any one time. The adoption of early pregnancy scanning, scanning for multiples and condition scoring should allow segregation of mobs, removal of culls early and targeted feeding of mobs while held in containment, and reduce problems such as dystocia due to over feeding of later lambing single bearing ewes.

Producers in the region were aware of the research that indicates higher lamb survival from twin bearing ewe flocks run as smaller groups at lambing. Most are unsure how significant this benefit would be locally or how to best implement this strategy, particularly in a mixed farming system. On the ground solutions and evidence was required for producers to be able to see how this strategy could work in their sheep flock.

Through their involvement with a PIRSA/MLA funded Red Meat and Wool Program Technology Group in 2021, local producers had an introduction to technology aimed at improving reproductive success of their enterprise. As a 1-year project this highlighted the options available, however demonstration of these tools and technology in the field and extension of the cost benefit analysis was required to significantly increase the adoption rates. As such this project extension activities also looked at improved genetic selection in commercial flocks, incorporating data collection and analysis on reproduction success, understanding ram genetics and Merino Flock Profiling (MFP).

Several producers submitted samples for MFP analysis and started the process of EID and ram selection and ewe retention on data-based decision making. These producers needed support to interpret their results, to refine their breeding objectives and plan for future breeding decisions with fertility in mind, including an understanding of the traits/indexes to focus on to breed robust animals for their production systems.

2 Objectives

By December 2024, in the Upper North region of SA:

1. At two sites demonstrate the use of pregnancy scanning ewes in containment for foetus number, as well as the use of condition scoring, and targeted feeding based on foetus number to increase lamb survival rates by 10% by;

i. More uniformly managing ewe condition score at lambing incl. setting targets, measurement, and adjusted management due to foetus number

ii. Improve accuracy of feed budgeting

Objective 1 was achieved; however four sites were used as demonstrations for one year each instead of two demonstration sites being measured for two years each. These four farmers pregnancy scanned their ewes, used condition scoring and targeted feeding based on foetus number under the guidance of Deb Scammell, providing rations and advice throughout ewe pregnancy to improve accuracy of nutrition and overall management. As a result, lamb survival rates were increased by 8%.

2. At two sites management options for managing smaller mob sizes at lambing in a mixed cropping business and demonstrate a 5% increase in lamb survival when twin bearing ewes are lambed in smaller groups.

Objective 2 was achieved; two sites were established however lambing in mobs smaller than 100 as advised by Deb Scammell was not possible at each site every year due to paddock availability and feed on offer. Four out of the six lambing cycles achieved mobs smaller than 100. An 8% increase in lambing was achieved on average.

3. 75% of core producers will have a clear breeding objective and incorporate one or more of the following:

1. Record and analyse data on ewe pregnancy history

2. Merino Flock Profile for their flock

3. Will track their ram team on RamSelect

4. Consider ASBVs and indexes when purchasing rams

Objective 3 was achieved. Setting a clear breeding objective was integrated into one-on-one sessions with Deb Scammell with core producers and is described in producer case studies. Objective 3 was also addressed at length with observer producers as extension activities during the project.

4. Implement skills and training development activities to increase the knowledge, skills and confidence of 27 producers so that 75% of core producers are implementing 1 or more of these practices in their enterprise.

Objective 4 was achieved successfully with 100% of core producers upskilled in feed budgeting, pregnancy nutrition, condition scoring, and the use of ASBVs in breeding decisions through their involvement with a livestock consultant. Observer confidence also increased as a result of training

activities. Everyone surveyed reported that they implemented 1 or more of the practices except one producer who had implemented all practices prior to the PDS project but commented that they valued the PDS for further information and upskilling.

5. Promotion to the wider group community through holding field days (1 per year), case studies (4) and technical reports (1 annually) and the established UNFS communication strategies including quarterly members' newsletter, UNFS Facebook and Twitter accounts, annual compendium and annual members' forums showcasing the project results and encourage adoption of key practices by livestock producers across the region and broader afield.

Objective 5 was successfully completed with all extension activities and supporting publications. 310 producers were upskilled in best practices management strategies through attending project extension activities. Many more were exposed to communications circulated more widely through social media networks. Nine extension activities and 26 communications were delivered.

3 Demonstration Site Design

3.1 Methodology

Producers involved in this project were selected at a meeting by UNFS Operations Committee (PDS Steering Committee). When the project commenced, four sites were selected. The two containment feeding site producers opted not to use containment in the second year so two additional sites were selected for a one-year period resulting in six sites involved in the project in total.

Four sites were established with containment feeding of pregnant ewes (as per best practice guidelines), to demonstrate the value of:

i. reduced joining period to 5-6 weeks
ii. correct ewe-to-ram ratios
iii. managing and feeding mobs separately based on condition score and foetus number.
iv. matching nutrition needs to rations formulated

Measurements - 4 sites over 1 lambing cycle each:

- Ewe condition score – pregnancy scanning & lamb marking
- Lamb marking percentage
- Ewe mortality
- Feed consumption
- Labour costs
- Record of other observations of variations in animal health and condition.

Two demonstration sites were established to demonstrate improved pregnant ewe management incorporating:

i. Development of a clear breeding objective including improved genetic data and decision making
ii. Pregnancy scanning
iii. Splitting twin bearing ewes into smaller groups for lambing.
iv. Ewe condition scoring and segregation within single bearing ewes based on condition.

Measurements – 2 sites over 3 lambing cycles:

- Ewe condition score – pregnancy scanning
- Lamb marking percentage
- Ewe mortality
- Labour & fencing costs (for smaller paddock set-up)
- Record of other observations of variations in animal health and condition.

The site locations and details are shown in Table 1.

Table 1: PDS site locations, rainfall and average number of ewes in the demonstration.

Site Number	Location	Demonstration	Average Annual Rainfall	Number of ewes in demonstration
1	Gladstone	Smaller mobs	435mm	410
2	Caltowie Nth	Smaller mobs	425mm	179
3	Bundaleer	Containment	450mm	1242
4	Wirrabara	Containment	460mm	1001
5	Caltowie Sth	Containment	435mm	769
6	Spalding	Containment	450mm	2359
TOTAL				5960

All producers worked alongside a livestock consultant to guide implementation of PDS demonstration practices. With the consultant, each producer participant selected paddocks for use in the trial for lambing twin bearing ewes in smaller mobs.

Ewes were pregnancy scanned, and twin bearing ewes split into mobs of less than 100 or as close to that as possible. For containment feeding sites, the consultant developed rations with each farmer in February and grain and hay was feed tested. Ewes were then fed formulated rations and mineral supplementation and condition scored at pregnancy scanning and lamb marking. Timing of pregnant ewes going into and out of containment was at the discretion of the farmers based on seasonal feed on offer and farm management.

Observations on paddocks including feed quality, feed on offer, shelter, topography and aspect were noted for paddocks demonstrating lambing in smaller mobs at the beginning of each year.

3.2 Economic analysis

A partial budget was completed on the demonstration site results in comparison with previous practice and long term average lambing percentage (lambs marked per ewe joined). It is worth noting that the demonstration site results are from individual seasons and are being compared to the long term average results. Therefore, some of the partial budget outputs are significantly impacted by seasonal conditions and could be influenced by other variables affecting lambing percentage.

3.2.1 Containment feeding

This analysis reviewed whether pregnancy scanning and differentially feeding ewes in containment creates more gross margin than the previous system of not scanning with paddock feeding.

The following information was provided for the economic analysis:

- Long term average lambing percentage prior to practice change.

- Cost of feed at varying stages of pregnancy during containment for both twin and single bearing ewes. This was provided on their ration recommendations.
- Resulting lambing percentages provided in lambs marked per ewe scanned pregnant.
- Total time spent on feed.
- Labour for feeding/managing sheep in containment.

The following assumptions were made to complete the partial budget:

- Where the number of dry ewes at scanning wasn't provided it was assumed the flock had 5% dries. This was done so the results (lambs marked per ewe scanned pregnant) could be comparable with historical results (lambs marked per ewe joined).
- In all scenarios, supplementary feeding had taken place in prior years before the practice change to scanning and containment feeding. It is assumed that the previous level of feeding (across dries, twin and single bearing ewes) was equivalent to what was provided to single bearing ewes at this demonstration site.
- The number of days on feed accounts for the period of time ewes were in containment and differentially managed based on pregnancy. Whilst feeding occurred outside of this time, it was assumed that this was the same as previous practice (due to being fed in paddock with the same rate across all ewes) and hasn't been included in this analysis.
- Scanning costs of $1.25 per ewe to account for scanning and the associated labour for that operation.
- An additional 0.5 hours per day for management time has been applied. This is over and above what has previously been spent feeding sheep. Previous practice would have likely been less frequent (i.e. feeding every few days) but also less efficient due to feeding across multiple paddocks. This was valued at $35/hour.
- Additional lambs have been applied with a net value of $100/lamb. This is less than the resulting sale price to account for additional variable costs such as health products, shearing/crutching, freight, sale fees etc.

3.2.2 Smaller mob sizes at lambing

This analysis looked at the impact on lambing percentage due to splitting up mobs of lambing ewes by using temporary fencing.

The following information was provided for the economic analysis:

- Long term average lambing percentage prior to practice change.
- Resulting lambing percentages provided in lambs marked per ewe scanned pregnant.
- Time spent managing sheep in smaller mobs per day.
- Time spent constructing temporary fencing.
- The cost of fencing materials was provided for one of the sites.
- The following assumptions were made to complete the partial budget:
- Where the number of dry ewes at scanning wasn't provided it was assumed the flock had 5% dries. This was done so the results (lambs marked per ewe scanned pregnant) could be comparable with historical results (lambs marked per ewe joined).

- Additional lambs have been applied with a net value of $100/lamb. This is less than the resulting sale price to account for additional variable costs such as health products, shearing/crutching, freight, sale fees etc.
- 60 days of additional labour valued at $35/hour.
- Where the cost for fence materials was not provided it was assumed to be the same as the other demonstration site.
- Fencing materials were assumed to have a useful life of 5 years. Given this, the purchase costs have been spread over a 5 year period. An opportunity cost on capital was also applied at 6%.

3.3 Extension and communication

The extension and communication activities were designed to enable producers to learn from the PDS project (See appendix 7.1 Communication Plan). Sessions were designed to suit producer needs providing opportunities to engage with livestock technical experts and researchers, practice skills such as condition scoring and feed budgeting, as well as engaging in peer-to-peer learning.

Activities undertaken included:

1. Two information sessions on managing the genetics of your commercial mob to improve reproduction outcomes. These included development of clear breeding objectives, particularly in relation to improved reproduction outcomes, the effective use of ASBVs to meet breeding objectives, and the use of the RamSelect app to track ram teams and training producers in interpretation of MFP results.
2. One information session per year on ewe nutrition management including condition scoring, feed budgeting, impact of mob size, effective containment feeding utilising the AWI Life Time Ewe Management Course content.
3. At least one open day each year at a demonstration site.
4. Case studies on producers and their enterprises developed for four sites.
5. Three annual reports published in the UNFS Annual Compendium including annual results, collation and analysis of demonstration site outcomes and activities.
6. Articles published in the UNFS quarterly newsletter.
7. A project summary is posted on UNFS website and a link to the final project results and resources will be made available on the website on completion of the project.
8. Social Media publicity of project activities 3-4 times per year.
9. A producer guide/fact sheet developed and distributed.

The above training workshops and field days were organised by Rachel Trengove, PDS facilitator, and delivered alongside recognised industry experts in condition scoring, feed budgeting, using ASBVs and the RamSelect app, breeding objective development and interpreting Merino Flock Profile results. All workshops and field days were open to everyone where venue capacity allowed. Some of the sessions were held in conjunction with other organisations such as the SA Drought Hub and Northern & Yorke Landscape Board. This collaboration provided additional funding for guest speakers and helped to ensure good producer attendance by avoiding duplication of livestock extension activities in the Upper North region.

3.4 Monitoring and evaluation

A comprehensive Monitoring Evaluation and Reporting plan aligned to the MLA MER framework was developed as a part of milestone 1, implemented and reviewed throughout the project. (see Appendix 7.2).

Producers were surveyed at the commencement and completion of the project.

Pre-projects surveys (entrance surveys) were developed and conducted with core and observer producers to:

- benchmark current knowledge and skills
- collect data on producer numbers and animals, and area potentially impacted by the project
- establish reproduction measures and current adoption of the practices demonstrated in the PDS

Post-project surveys (exit surveys) were conducted by core and observer producers to enable assessment of changes in:

- reactions (perceptions, enthusiasm etc.) as a result of the project
- knowledge, Attitudes, Skills and Aspirations
- adoption of practices

Metrics measured:

- Successful demonstration of easily adopted management practices for running smaller mob sizes at lambing
- Positive cost:benefit of adopting management changes necessary to implement smaller mob size at lambing
- Successful demonstration of the value proposition to managing ewes in containment based on their condition score, foetal number
- Increase in number of producers adopting:
    - Pregnancy scanning for multiples
    - Selective management of twin bearing ewes
    - CS of ewes
    - Lambing in smaller mobs
- An increase in producer understanding of genetic implications in reproduction including the use of tools such as ASBVs, the RamSelect app and MFP
- Producers have developed skills in condition scoring, feed budgeting, and using genetics for improved productivity
- Profitability was measured by net benefit per DSE ($/DSE)
- Productivity was measured by reproductive efficiency (lambing %) and mortality rate (%).

4 Results

4.1 Demonstration site results

4.1.1 'Lambing in smaller mobs' demonstration sites

Two demonstration sites were provided by Upper North producers located near Caltowie and Gladstone to track the implementation of pregnancy scanning and lambing multiples in smaller mobs. The demonstration sites aimed to run twin-bearing ewes in mobs of 100 or fewer during lambing to reduce the risks of mismothering, ewe-lamb separations, and lamb mortality. Over the three years of this PDS project, the average increase in lambing marking was 8% compared with historical lambing results prior to adopting the practice of lambing multiple bearing ewes in smaller mobs.

Table 2. Results for Site 1 and Site 2 for three lambing cycles.

Site Name	Number of lambs	Number of ewes	Lamb marking (%)	*Condition score at pregnancy scanning*	*Ewe mortality (%)*	Historic lambing results (%)
Site 1						100%
Singles 2022	68	62	110%	*3.36*	2.4%	
Multiples 2022	150	128	117%			
Overall %	218	190	115%			
Site 1						
Singles 2023	71	65	109%	3.25	4.9%	
Multiples 2023	104	76	137%			
Overall %	175	141	124%			
Site 1						
Singles 2024	91	88	103%	3.3	2.8%	
Multiples 2024	149	116	128%			
Overall %	240	204	118%			
Site 2						110%
Singles 2023	327	232	141%	3.5	2.0%	
Multiples 2023	453	292	155%			
Overall %	780	524	149%			
Site 2						
Singles 2024	158	166	95%	3.5	2.4%	
Multiples 2024	245	175	140%			
Overall %	403	341	118%			

2022 Season

2022 presented challenging lambing conditions at both sites due to a late break in the season, lack of feed on offer for pregnant ewes and harsh cold conditions during lambing. Adequate shelter was a limiting factor for lambing paddocks at both sites and was reflected in poorer results in 2022 compared with 2023, as shown in Table 2. Condition scores were ideal at both sites at the time of pregnancy scanning.

Site 2 experienced low lamb survival with lamb marking rates of 89% singles and 88% multiples. The producer was limited by paddock availability (due to the late break sown feed hadn't germinated in the smaller lambing paddocks) and therefore mob sizes were much larger than the target of 100 in 2022. A large mob of multiples lambed in a laneway with inadequate shelter with many lambs lost during the 48 hours post-lambing due to a weather event.

A high ewe mortality of 4% was recorded at site 2. This was likely due to the mixing of twins and single bearing ewes which occurred (due to inadequate paddocks) resulting in a lot of dystocia issues with later lambing single bearing ewes. Regionally in 2022, significant ewe deaths were observed due to calcium deficiency especially in older ewes. A high-quality pre-lambing lick was made available in the following years ad-lib (and available all the time) 4 – 6 weeks out from lambing. Due to the high quantity of supplementary feed in years like 2022 with no paddock feed, it's very common to have ewe deaths or difficult births due to Calcium and Magnesium deficiency. The target provided by Deb Scammell for commercial producers was to aim for ewe mortality of 2% or less. This was achieved at site 2 in the following two lambing cycles and was likely attributed to changes including adequate mineral supplementation, more diligent monitoring of condition score and running younger ewes.

The laneway paddocks allocated to the large mob of multiple bearing ewes had little feed value at all and required a large quantity of supplementary feed. Unfortunately, this increases the risk of mismothering as all the ewes are walking back to the same area. As we can't create feed on offer in the paddock without rain the best method of ensuring high marking percentages in twin mobs in years like this is to reduce mob size and provide supplementary feed at a few different feed stations – i.e 2 self-feeders and 2 different hay feeding sites for mobs in future years.

Average condition scores were ideal in 2022. However, at site 2, the range recorded was from 2.6 – 4 CS which is significant, especially for multiples. As singles and twins were mixed in some mobs this would have likely contributed as nutrition couldn't be precise. It was recommended to keep mobs within around 0.5 of a condition score (especially during late pregnancy) and if there is a large range, drafting ewes up in mid pregnancy based on condition score and feeding the tail slightly more or put them on a better paddock. Often the mortality and decrease in lamb marking percentage is due to the ewes that are below the average of the mob so drafting these off can make a large difference to overall results. It was recommended as a future practice to not only monitor average condition score of the mob but also graph scores to show the range as this will provide something to correlate lambing results back to.

2023 Season

Both sites recorded an increase in lamb marking percentage in 2023. Environmental factors are expected to have contributed to the positive results, with an earlier break in the season providing improved green pasture feed on offer for pregnant ewes and lambs as well as milder weather conditions at the time of lambing. Less reliance on supplementary feeding compared with 2022 would have assisted with a reduction in mismothering.

Site 1 showed an increase in lamb survival in 2023 from already strong results in 2022. Mob size was down to 76. High ewe mortality was recorded at site 1 and could have been feed related at lambing,

even though there was some green feed available it was still too short to satisfy all of the ewe energy requirements, and no supplementary feed was provided. It was expected pregnancy toxaemia and possibly some mineral deficiencies contributed to the mortality %.

Site 2 showed the most significant improvement in lamb survival from 2022 to 2023. Smaller paddocks were available at site 2 in 2023 as sown feed had grown with an earlier break, this enabled mob size to be reduced for twin bearing ewes. Additionally, ewe mortality decreased at site 2 in 2023. Scanning results were inaccurate as shown in the results with 141% for singles, it is assumed there were twin bearing ewes in the singles bearing ewe mobs and vice versa so results per mob were inconclusive.

Ewe mortality was also very good at 2% over lambing. Average ewe condition score was ideal at pregnancy scanning at 3.25, less variability in condition scores across ewes was observed than the 2022 season. Overall lambing results were exceptional across all the mobs. Milder lambing conditions also assisted with lamb survival; however, nutrition was precise, and lambing mobs were recommended size which contributed to the result.

2024 Season

2024 was one of the driest seasons on record for the region, and very challenging for both cropping and grazing. There was a very late season break in June and then dry conditions throughout winter/spring. The high supplementary feeding requirements into lambing is expected to have increased the risk of mismothering.

At site 1, mob size of under 100 multiple bearing ewes was unachievable and splitting mobs into the smaller paddocks was not an option in 2024 due to a severe lack of feed. Multiple bearing ewes were in larger paddocks sown to barley/vetch but with a limited germination. Due to seasonal conditions, there were three mobs, two with 120 ewes and one with 170 ewes. Results remained positive at these mob numbers achieving 103% in singles and 128% in multiple bearing ewes. Ewes were supplementary fed well to make up for the lack of paddock feed available and were given plenty of access to self-feeders and hay to minimise mismothering where possible. Even in the slightly larger mob of multiples multiple feeding stations still allowed a reasonable lamb survival % in a very tough season.

At site 2, mob sizes of multiple bearing ewes were 129 and 50 ewes. Lambing percentages were positive with 95% for singles and 140% for multiples. Ewe mortality was relatively low at 2.3%. Ewes were in quite good condition score however there was a lack of paddock pasture available and multiple bearing ewes were only fed hay, when the correct nutrition should have included some grain supplement up to lambing. It is possible some of the lamb size was likely to be slightly under optimum in the multiple mobs due to a slight energy / protein deficiency in the last trimester which would have reduced overall lamb survival.

General Observations

Pasture quantity and quality were visually assessed and noted over the seasons and supplementary feed requirements determined for ewes for all three lambing cycles to maintain consistency. However, even when providing supplementary feed, it’s hard to replicate the lamb survival when adequate pasture feed on offer is available.

A challenge with mixed farming enterprises is paddock availability and achieving optimal paddock sizes for both sheep and cropping. For this PDS, larger paddocks were split with electric fencing for lambing, but seasonal conditions meant this was not always possible with delayed germination in the 2 of the 3 seasons.

Observations during the PDS project indicated that paddock characteristics contribute significantly to lambing percentage, i.e., paddocks with shelter, in comparison to paddocks with exposure to harsh south winds and weather fronts or those close to a train line or busy road. Anecdotally, the producer at site 1 thinks it contributes to up to 10% increase in lamb survival by having a 'good lambing paddock'.

Segregation of ewes within mobs based on condition score was recommended but not always practical or possible to achieve on farm due to paddock availability at the demonstration sites. If there is too much of a range in condition scores while supplementary feeding, it can affect ewe mortality, lamb birthweights and survivability. Segregating ewes within mobs based on condition scores could have improved lambing results further and is a management practice worth considering by these producers into the future.

By splitting paddocks into smaller sizes in order to run smaller mobs of multiple bearing ewes, there can be a positive outcome on stocking rate and pasture utilisation leading to increased productivity. Effect of paddock size was not measured in this PDS project but is worth considering by producers to manage excess quantities of spring feed. When feed is growing, grazing areas can be split into smaller areas often resulting in increased stocking rates and sometime producers end up with extra paddock area available to cut for hay or to reap to store for summer/autumn feeding.

4.1.2 'Selective management of multiple bearing ewes in containment' demonstration sites

Over the three years of the PDS project, the average increase in lamb marking was 8% compared with historic lambing results before twin and single bearing ewes were managed selectively in containment.

Table 3. Results for site 3, site 4, site 5 and site 6 for selectively managed containment fed pregnant ewes for one lambing cycle.

Site Number	Number of ewes	Number of lambs	Lamb marking (%)	Condition score at pregnancy scanning	Condition score at lamb marking	Historic lambing results (%)
Site 3						
Singles 2023	547	527	96%	3	2.8	100%
Multiples 2023	454	744	164%	3.5	3.3	
Overall %	1001	1271	127%			
Site 4						
Singles 2022	334	328	98%	3.3	3	100%
Multiples 2022	435	607	140%	3.3	3	
Overall %	769	935	120%			
Site 5						
Singles 2024	1239	1149	93%	3.5	3	80%
Multiples 2024	1120	1483	132%	3.5	3.4	
Overall %	2359	2632	112%			
Site 6						
Singles 2024	625	513	82%	2.8	2.4	100%

Multiples 2024	617	765	124%	2.9	2.6	
Overall %	1242	1278	103%			

Site 3

Ideal condition scores were achieved at pregnancy scanning and ewes held condition through to lamb marking. Site 3 recorded the largest increase in overall lambing of 27% from 100% historically to 127%. Positive results of 96% survival in single bearing ewes and high 164% in multiple bearing ewes in 2023. Data for this site is in 2023 which had a more favourable season with feed on offer available in paddocks at lambing which likely contributed somewhat to the highest results. However, nutrition throughout the whole of pregnancy was precise which was reflected in ewes lambing in optimum condition score. Ewes were also lambed in small lambing mobs.

At site 3, there was a big difference in hay quality of two hay sources demonstrated via the feed tests. Rations were formulated to use the lower quality, higher fibre Canola/ Vetch / Ryegrass hay ad-lib earlier in pregnancy along with barley and lupins. The high-quality sorghum / brassica / medic hay was introduced for twins at day 140 and singles at lambing which reduced the reliance on grain over lambing time which can be beneficial for animal health reasons.

Site 4

Ideal condition scores were achieved at pregnancy scanning and ewes maintained good condition through to lamb marking. Positive results of 98% survival in single bearing ewes and 140% in multiple bearing ewes resulting in an overall increase of 20% lambing from a historical lambing figure of 100% to 120% in 2022. Ewes were fed from March until end of June for 16 weeks feeding which is longer than normal due to dry start and lack of FOO.

Site 5

Ideal condition scores were achieved at pregnancy scanning and ewes held condition through to lamb marking. Positive results of 93% survival in single bearing ewes and 132% in multiple bearing ewes seeing an increase in 32% lambing from an historical lambing of 80% to 112% in 2024, noting that the historical figure is a relatively low baseline. Results were also likely affected by very poor seasonal conditions and low rainfall in 2024.

Single bearing ewes were in hill country and not fed in containment. Multiple bearing ewes were fed lucerne hay and vetch barley hay in containment for 8 weeks prior to lambing.

Site 6

Results at site 6 were the lowest of the four containment feeding sites. Condition scores were also lowest with quite a bit of variation, so this is likely correlated with lower lambing percentages. Ewes came out of containment only slightly below condition score targets but unfortunately due to lack of paddock pasture and low hay supplies on farm ewes were fed below targets into lambing and condition scores likely dropped off before the point of lambing. 82% survival was achieved for singles and 124% for multiple bearing ewes with an average of 103% survival. Results were also likely affected by very poor seasonal conditions and low rainfall, providing next to no feed on offer in paddocks offering very little nutritional quality. Sourcing hay in a tight market in 2024 with the incredibly dry season in 2024 across SA was a common challenge for producers. Supplementary feeding went longer than first planned.

Suffolk ewe lambing rations were just ad-lib frosted wheat hay and the twins required a small quantity of grain to meet energy requirements. For Merinos, barley hay and barley grain was fed through containment with limited supplementation over lambing.

General Observations

Hay quality varied considerably across the project. The importance of feed testing and using this information to correctly formulate rations was emphasised. Hay ranged from very high fibre, low energy hay baled in 2022 to very high-quality hay baled in 2024. The differences between feed quality can be seen in Table 4.

On all sites the importance of feeding calcium when containment feeding was discussed. Multiple bearing, older ewes were prone to hypocalcaemia related deaths over lambing due to the high quantity of low calcium feed's fed in a cereal area when no pasture is available.

Feed tests on hay, grain and pastures were conducted on farm to determine rations for maintaining condition score of ewes into lambing. Pasture quantity and quality was also assessed over the season and taken into consideration when determining supplementary feed requirements.

Results at all sites saw varying degrees of improved lambing percentage compared with historic averages, indicating that implementing practices such as pregnancy scanning and matching nutrition with pregnancy status results in improved reproductive success. At sites 3, 4 & 5, both single and multiple bearing ewes had good average condition scores and were in ideal condition for ewes pre-lambing as a result of correctly formulated pregnancy rations in containment. Good seasonal conditions also resulted in good feed on offer in lambing paddocks in 2023. This is also a result of the containment period though as it allows pasture to get in front of the ewes before they are let out onto lambing paddocks.

Condition score was monitored on each of the sites and was used to determine if the nutrition during pregnancy was correct and helped determine if ewes were being fed adequately in containment. In most cases, condition score could be correlated with the eventual lambing results as expected. The very dry 2024 season demonstrated the advantage of containment feeding breeding stock in these areas. Producers could retain breeding numbers if they decided to, knowing they could effectively manage pregnancy nutrition and preserve paddock cover with the use of containment.

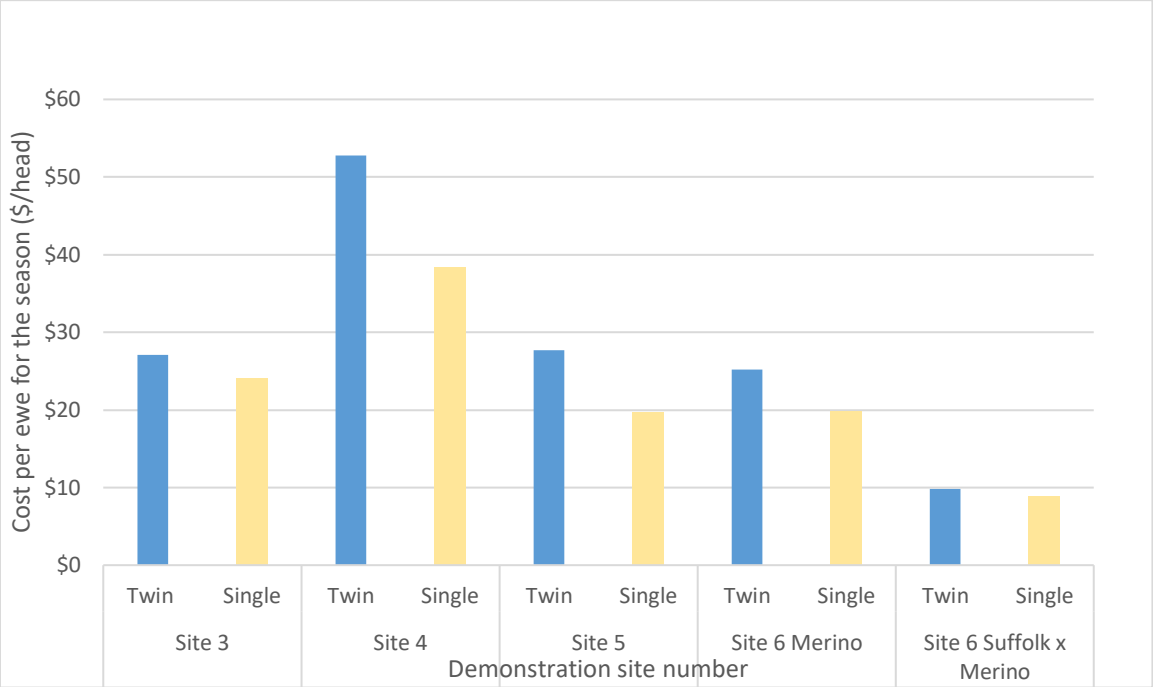
Producers who containment fed ewes and worked alongside a livestock consultant during the course of the PDS project were likely to condition score ewes regularly and keep an eye on condition being in pens often close to the yards compared with if ewes were out in the paddock. These producers often followed through and selectively managed ewes at lambing with priority paddocks and smaller mobs for multiples, therefore managing additional factors that lead to improved lambing percentage.

Table 4. Feed test results for hay grain & pastures.

Feed Type	Dry Matter (DM) %	Protein (% of DM)	Energy (MJ/kg DM)	NDF (% of DM)
Barley	91.7	12.8	13.3	19%
Lupins	93.9	31.9	14.8	25%
Barley/Vetch Hay	92.8	7.3	8.7	56%
Vetch/Barley Hay	92.3	15.7	10.8	41%
Vetch Hay	92.7	22.5	10.9	35%
Canola/Vetch/Ryegrass Hay	92.4	7.6	6.4	71%

Sorghum Brassica Medic Hay	92.2	9.9	10.9	46%
Paddock Feed	90	4	5	70%

Figure 1: Feeding costs for twin and single bearing ewes in containment across sites



Feeding costs varied significantly across the containment demonstration sites as seen in Figure 1, depending on the ingredients that made up the rations fed and number of days fed. The range for multiple bearing ewes was from $10 per ewe to $53 per ewe during pregnancy. Costs were calculated on average grain and hay prices for the season of lambing, however each enterprise has a unique source, most supplying their own grain and hay on farm which would reduce feed costs.

4.2 Economic analysis

Table 5. Cost: benefit for site 3, site 4, site 5 and site 6 for selectively managed containment fed pregnant ewes.

Year	Site Number	Breed of ewes	Number of days	Number of ewes	Increase in lambing percentage	Net benefit $(/ewe)	Cost per additional lamb
2023	Site 3	Crossbreds and Merinos combined	60	1054	21%	$ 18.26	$ 11.30
2022	Site 4	Crossbreds and Merinos combined	80	779	20%	$ 11.30	$ 43.59
2024	Site 5	Crossbreds and Merinos combined	60	2655	19%	$ 16.33	$ 14.64
2024	Site 6	Merino	80	788	-21%	-$ 25.45	NA
2024	Site 6	Merino x Suffolk	20	651	1%	-$ 0.71	$ 166.00

The results show large variations between sites and seasons (Table 5). It is important to note that some of the net benefit results are in a poor season and are compared to the long-term average not a control flock. Therefore, are misleading as they appear as a significant loss. On average, the sites achieved an increase in lambing percentage of 8% (lambs marked per ewe joined).

Results varied from -$25.45 to $18.26 with an average of $3.95 net benefit per ewe joined. This average is impacted by one of the demonstration sites where a lambing percentage high than the long-term average was not achieved due to seasonal conditions. The average would increase to $11.30 net benefit per ewe joined without this data point.

The net benefit per ewe joined results are the margin over the cost of scanning, additional feed and labour. This hasn't taken into account the cost of the containment pens themselves which needs to be further considered before adoption. An analysis provided by livestock consultant Deb Scammell, Talking Livestock "Fencing pen set up costs" estimated a total cost of $30,556 (excluding labour) to construct containment pens large enough to hold 2,000 ewes. Assuming a 20-year useful life and a 6% opportunity cost on capital, this can be represented as an annualised cost of $2,444 or $1.22/ewe. This accounts for the ongoing depreciation of the pens and the opportunity cost on the funds used to build them.

An alternative way to view the results is to look at the cost per additional lamb. This is calculated by taking the total operating costs of containment pens and associated differential feeding and dividing it by the number of additional lambs produced. The sites averaged $58.88 per lamb where an increase in lambing percentage was observed. Again, this was variable and aligns with the net benefit per ewe results.

The economic analysis has not attempted to quantify any additional benefits that may result from containment, such as improved ground cover, soil preservation, improved pasture species and improved feed on offer over lambing.

Table 6. Cost: benefit for site 1 & 2 for lambing multiple bearing ewes in smaller mobs.

Year	Property	Number of ewes	increase in lambing percentage	Net benefit $/ewe	Cost of additional lamb	Avg. net benefit $/ewe	Avg. cost per additional lamb
2022	Site 1	190	9%	$ 7.67	$ 17.07	$10.91	$13.36
2023		141	18%	$ 15.67	$ 11.95		
2024		204	12%	$ 10.63	$ 12.15		
2023	Site 2	524	32%	$ 23.90	$ 24.26	-$10.67	$46.50
2024		341	2%	-$ 9.66	$ 559.98		

The results show large variations between sites and seasons (Table 6). It is important to note that some of the net benefit results are in a poor season and are compared to the long-term average not a control flock. On average, the sites achieved an increase in lambing percentage of 15% (lambs marked per ewe joined).

The average net benefit per ewe joined was $10.79 ranging from -$9.66 to $23.90. It's important to note that other variables also influenced the uplift in lambing percentage as it is compared to the long-term average. Given increased focus on lambing percentage it is likely that condition score

management in ewes has improved over recent years and may be influencing the difference with long term average lambing percentage.

Alternatively, results could be viewed by looking at the cost per additional lamb, which averaged $125.08, ranging from $11.95 to $559.98. Whilst there is a large range, 4 out of the 5 results achieved <$25/lamb.

4.3 Extension and communication

UNFS conducted annual workshops and other activities to showcase demonstration site results, increase the confidence of core and observer producers and encourage adoption of key practices by attending producers.

The PDS group consisted of four core producers and 18 observer producers and many more attendees at extension activities outside of this PDS group. UNFS has delivered eight extension activities and 26 communications over the three-year project (Table 7 & 8, Appendix 7.4).

Table 7. UNFS PDS Extension Activities

2022				
Activity	Date	Technical Presenters	Topics	Attendance
Session 1: Improving Reproductive Success Location: Caltowie	June	Michelle Cousins - Merino Services Andrew Michael - Leachim Stud Host producer case study: Alison Henderson - LOTSA Lambs PDS host	• Defining a breeding objective • Merino Flock Profiling—understanding test results & how to use the information • Understanding Australian Sheep Breeding Values (ASBVs) and Indexes • Why use ASBVs when buying rams • Using the RamSelect app • Pregnancy scanning ewes, splitting twins & singles, and managing smaller mob sizes • Farmers encouraged to bring DNA testing results along on the day	26
Session 2 Flock profiling & setting a breeding objective (in conjunction with Red Meat & Wool project)	July	Andrew Michael - Leachim Stud Anne Collins - AC Ag Consulting	• All producers conducted flock profiling prior to the workshop • Merino Flock Profiling—understanding test results & how to use the • Understanding Australian Sheep Breeding Values (ASBVs) and Indexes • Why use ASBVs when buying rams • Defining a breeding objective information • RamSelect app	13
Session 3 Presentation at UNFS Expo – LOTSA Lambs	August	Deb Scammell - Talking Livestock	LOTSA Lambs PDS: • Introduction to project • Containment feeding technical presentation Introduction to project	90

PDS - Confinement feeding - Deb Scammel, Talking Livestock.				
2023				
Session 4 Implementing EID's on farm & Improving Reproductive Success Location: Melrose	February	Nathan Scott - Achieve AG Solutions Deb Scammell - Talking Livestock Host case study: Caleb Girdham - LOTSA Lambs PDS host	The what, how, and why (or why not) of applying eID practically on your farm. • How the technology works • Equipment options • What data to collect • Understanding the implications of applying selection pressure • How to collect data & tips on managing data Improving Reproductive Success • Pregnancy requirements & this season's feed • The fit of containment this year • Containment costs $$ - benefits and feed on offer – the data On farm demonstration: auto drafter, yards & containment feeding set-up	42
Session 5 (2 workshops) Improved Weaner Management LOTSA LAMBS Location: Wirrabara Location: Wilmington	June	Deb Scammell – Talking Livestock Will Van Weterre – Adelaide University Colin Trengove – ProAg Consulting Host case studies – Lachie Smart & Michael Battersby LOTSA Lambs PDS host) Sticky beak at hosts containment yards	• The weaning process • Weaner growth targets • Weaner nutrition & maximising spring feed • Successful breeders from weaners • Managing heat stress in sheep • The benefits of using vitamins & melatonin (Regulin) to improve the productivity of sheep during periods of heat • Results from the Upper North • Strategies to optimize weaner health • Preventing worms and other common challenges • Free feed test offered to all participants by N&Y Landscape Board	28
2024				
Session 6	August	Nathan Scott - Achieve AG Solutions	LOTSA Lambs presentation: • PDS results and findings	80

Presentation at UNFS Expo – LOTSA Lambs PDS results			• Improving twin lamb survival by reducing mob size • Optimal allocation of lambing paddocks to twin bearing ewes • Lambing management	
Session 7 Flock profiling & setting a breeding objective (in conjunction with PIRSA's Wild dog and livestock productivity project)	August	Andrew Michael - Leachim Stud Anne Collins - AC Ag Consulting	• All producers conducted flock profiling prior to the workshop • Merino Flock Profiling— understanding test results & how to use the • Understanding Australian Sheep • Breeding Values (ASBVs) and Indexes • Why use ASBVs when buying rams • Defining a breeding objective information • RamSelect app	12
Session 8 Livestock strategies for the next 100 days (in conjunction with SA Drought Hub's Sheep Containment Feeding – Pilot Program)	August	Deb Scammell - Talking Livestock Felicity Turner - Turner Agribusiness Ken Solly Host case study & sticky beak at containment yards - David Moore - LOTSA Lambs PDS site	• Meeting young animal targets in a tough season • Ewe recovery • Looking after yourself and your feedbase • The importance of decision making tools to forecast and make decisions • Coping better in challenging times	20
TOTAL				**311**

Table 8. UNFS PDS Communications

Date	Communication type	Communication channel
2022		
January	Email sent to UNFS members introducing the PDS project	Email (250 members)
February	Expressions of interest emails sent out to UNFS distribution list	Email (250 members)
February	Project summary – UNFS website PDS 2 Lotsa Lambs – Upper North Farming Systems	UNFS website
February	Project summary – MLA website Lotsa Lambs - Improving Reproduction Success | Meat & Livestock Australia	MLA Website
May	Article introducing the PDS hosts and locations and Lotsa Lambs objectives and key practices being demonstrated.	Newsletter
May	Invitation for core and observer producers to become a member of our learning groups and attend workshops and demonstration site visits.	Newsletter
August	Event summary – Session 2: Flock Profiling	Newsletter

September	Event summary – Session 1: Improving Reproductive Success	Newsletter
2023		
February	Event summary – Session 4: Implementing eID's on farm and Improving reproductive success	Newsletter
May	LOTSA Lambs annual report – UNFS Compendium publication distributed to 250 members and posted on UNFS website Publications – Upper North Farming Systems	UNFS Compendium
May	Implementing eID's on-farm and improving reproductive success Implementing eID's on-farm and improving reproductive success | Meat & Livestock Australia	MLA website
June	General LOTSA LAMBS Project Update – sites and seasonal conditions	Newsletter
June	Article: Event summary - Session 5: PDS LOTSA Lambs Workshop- Improved Weaner Management – Wirrabara and Wilmington	Newsletter
December	Article: PDS update – Producer Andrew Kitto, summary of results & photos	Newsletter
2024		
April	Photo pictorial: LOTSA Lambs PDS Project update –'The season for pregnancy scanning and condition scoring'	Newsletter
May	LOTSA Lambs annual report – UNFS Compendium publication distributed to 250 members and posted on UNFS website Publications – Upper North Farming Systems	UNFS Compendium
July	Radio interview – ABC radio country hour (North & West) – LOTSA Lambs update during lambing season – objectives of the project and results & outcomes (Link to interview expired)	Radio
August	Event summary & photos Session 8: Livestock strategies for the next 100 days	Newsletter
August	Report on Merino Flock Profiling Workshop (Session 9) – publication in conjunction with PIRSA's Wild Dog & Livestock Productivity Project	Newsletter, website, email distribution, PIRSA distribution
2025		
March	LOTSA Lambs project final report to be posted on UNFS website – Under Resources tab (after final report is accepted) Publications – Upper North Farming Systems	UNFS website
March	Producer Case Study – Lachie Smart	MLA comms, UNFS newsletter, UNFS website
March	Producer Case Study – Alison Henderson	MLA comms, UNFS newsletter, UNFS website
March	Producer Case Study – Andrew Kitto	MLA comms, UNFS newsletter, UNFS website
March	Producer Case Study – David Moore	MLA comms, UNFS newsletter, UNFS website
March	Factsheet - Guide to managing ewes in confinement feeding over summer to maximise reproduction success with a planned autumn lambing.	MLA comms, UNFS newsletter, UNFS website
May	LOTSA Lambs final report – UNFS Compendium publication distributed to 250 members and posted on UNFS website Publications – Upper North Farming Systems	UNFS Compendium

- UNFS member number 250

- External resources including relevant articles and information were distributed to producers when appropriate to link producers with research and findings outside of but related to the PDS project.
- Quarterly newsletter is emailed to 250 members and posted on UNFS website
- UNFS social media posts include promotion of upcoming events and brief post event reports including photos – 10,0000 UNFS Twitter and Facebook followers
- Newsletters and Compendium reports can be found on UNFS website; Upper North Farming Systems – Facilitating capacity building and empowerment of the Agricultural Community across the Upper North region
- Hard copy MLA publications were supplied to producers at workshops on topics related to the LOTSA Lambs PDS with good numbers of publications taken home from events
- Enthusiastic facilitated discussion at workshops indicated engagement and peer to peer learning
- Hosting extension activities on farm and enabling "Sticky beaks" at producer's containment yard set-ups and lambing paddocks has been positively received, anecdotally farmers have communicated that they have taken home several ideas from this experience
- Guest speakers shared data from research outside of our UNFS demonstration sites and UNFS region

4.4 Monitoring and evaluation

24 producers were surveyed at the beginning of the project and out those producers, 21 completed a final survey at the completion of the project with results including:

- 85% of participants surveyed rated their satisfaction with this PDS 8/10 or above. Average satisfaction rating of all surveyed was 8/10
- 74% of participants scored the value the PDS in assisting them to manage their livestock enterprise as 8/10 or above. The average value rating of all surveyed was 8/10.
- 32% participants increase in skills in condition scoring.
- 68% participant increase in knowledge and understanding of ASBV's.
- 79% participant increase in knowledge and understanding of Merino Flock Profiling.
- 21% participant increase in knowledge and understanding of feed budgeting of pregnant ewes in containment.

Table 8. Analysis of % change in adoption of practices relevant to improved reproductive performance from pre-survey to post survey results as result of participating in this PDS.

Practice	Practice adopted	% of producers
Pregnancy scanning of ewes for foetus number	Adopted prior to PDS Practice implemented Intend to adopt	35% 40% 25%
Targeted feeding based on foetus number	Adopted prior to PDS Practice implemented Intend to adopt	20% 30% 40%

Lambing in smaller mob sizes when twin bearing	Adopted prior to PDS Practice implemented Intend to adopt	20% 45% 20%
Use condition scoring of ewes	Adopted prior to PDS Practice implemented Intend to adopt	40% 40% 5%
Merino Flock Profiling	Adopted prior to PDS Practice implemented Intend to adopt	10% 50% 15%
Use of RamSelect to track your ram team	Adopted prior to PDS Practice implemented Intend to adopt	10% 35% 35%
Consider ASBV's when purchasing rams	Adopted prior to PDS Practice implemented Intend to adopt	20% 55% 10%

Note –table excludes N/A responses

Comments in response to the post-survey question '*How valuable was this PDS in assisting you to manage your livestock enterprise?'*:

- *It's good to have a demonstration site proving the theory, rather than just relying on reports and presentations to get the message across.*
- *Program was very informative on use of ASBVs for ram selection and flock profiling*
- *Without programs like this it's hard for businesses of similar size to see how a change in their breeding program could increase profitability*
- *The content was excellent however I am unsure whether it was the PDS program or the organiser that made the events what they were*
- *The program helped understanding of ewe nutrition and management practices.*
- *Very helpful information on how to improve lambing percentages. How to maximise lambs on the ground from percentages of lambs scanned. Support and follow-up were excellent.*
- *Good way to run trials on your own land without the pressure of having to manage it all*
- *The sessions I attended the presented information in an understandable way, in a group setting where questions from the group helped expand knowledge beyond your own situation.*
- *Having expert knowledge. Meeting other growers and seeing their setups*
- *Helpful information for growers looking to improve their systems*
- *All producers need to continue to improve genetics, lamb numbers and ewe quality.*
- *PDS's are always a good opportunity to see other producers' setups and infrastructure. It is a chance to learn both in theory and in practice which gives a realistic idea of how to implement in your own business.*
- *The Workshops I attended were very well organised, with really good Speakers.*

- *Containment feeding session has been implemented on our farm to better manage ewes in the lead up to lambing.*
- *Information presented was applicable to our farming enterprise and was easy to understand. The presenters offered insight into the producer benefits of improving lamb survival on farm and the importance of sheep traceability to our industry.*
- *Any workshop is worth going to even if you only learn 1 new thing*

Comments in response if the participant selected 'other' as a reason for not yet implementing any of the practices, explanations provided:

- *It is difficult to get the scanner to come when you want, it is difficult to get the timing window right among shearing and seeding, it is difficult to have enough paddocks for all the little mobs.*
- *We are not a self-replacing merino flock that is mated to white Suffolk*
- *Targeted feeding can only occur once scanning has taken place.*
- *Lambing twins in smaller mob sizes doesn't really suit my rotational grazing system as I see it*
- *We have flock profiled before and will do it again probably 5 years apart*
- *The stud we use don't do ASBV. They do a different dna testing/ profiling system*
- *We are not setup for managing twin bearing ewes on the lease country we now use to lamb our ewes down on. We maybe in the future. Also there seems to be a skill shortage in accurately identifying multiple bearing ewes and we've found if not done accurately there can be disastrous outcomes if not managed appropriately.*
- *We intend to lamb in smaller mobs, once we have implemented Scanning*
- *We intend to use Merino flock profiling if we continue to run Merinos*
- *We intend to utilise RamSelect.*
- *Large paddock sizes on extensive grazing property so not financially practical to fence into smaller paddocks to reduce mob sizes at lambing.*
- *Hard to muster sheep in for preg scanning due to property size. Also travel is expensive to get a preg scanner to come to remote properties.*
- *Supplementary feed is purchased when financially possible. Lamb price has fluctuated drastically the past 2-3 seasons so it is hard to financially justify the price of high cost inputs like fodder.*

Comments in response to the question "Have you made/do you intend to make any other changes to your business as result of participating in this PDS?"

- *Continue to develop skills in interpreting ASBV'S.*
- *With a greater understanding of ASBV's it's making sure the range we are purchasing are good value for money and we see the results*
- *Continue using the flock profiling to help make informed decisions about flock direction*
- *Continue to use the feed budgeting tools to help utilise feed to use it efficiently and help get more lambs on the ground*
- *Pre mating and pre lambing nutritional drench*
- *Feed budgeting for pregnant ewes*
- *Keep focusing on improving genetics and increasing lamb numbers, survival and weight gains.*

- *Weve definitely refined our breeding objectives since participating in this PDS. We knew monitoring ewe condition score at key times was very important, but it has once again highlighted the importance of this moving forward*
- *We intend to utilise our Feedlot sooner, when paddock feed quantity/ quality, drops too low*
- *We will endeavour to have feed grain on hand to supplement feed our pregnant ewes, prior to lambing, and to ""grain imprint"" the young lambs*
- *We plan to divide paddocks into smaller sizes if seasons turn around and it becomes financially possible to do so. However, costs of inputs are rising exponentially and farm income has stagnated with livestock prices not reflecting the cost of production.*

Comments in response to the question “What impact did implementing the above practices have on your marking percentages (% lambs, at lamb marking)”

- *There are too many seasonal conditions at play that have had a larger impact than any new knowledge learned.*
- *Positive 5-10% increase*
- *We achieved 125% in maiden ewes and 130 in other ewes in 2024*
- *Ongoing improvement. Hard to truly quantify due to the wild swings in seasonal conditions. However, due to the management changes implemented our lamb marking % in 2024 in a Decile 0 growing and year was 107% in a self replacing Merino flock.*
- *Increase by 15-20 %, by scanning for twin bearing and feeding accordingly*
- *We had just on 100 percent down from normal average however i think this year we may make greater gains with more implementation*
- *Increases of up to 15 percent at lamb marking*
- *Slight improvement in lambing %*
- *Very tough lambing year (lowest winter rainfall ever) resulted in similar to usual lamb marking percentages 105%, despite many lambs not making it. Expect to see an increase in a more average year. Am positive both practices were helpful.*
- *Increased until last year season was terrible young ewes percentage way down on scanning*
- *Increased Lambing % that season*
- *By selecting rams with the traits we value (including fat, muscle and condition score) we hope to improve our lambing percentage by 10-15% in the coming years. This along with monitoring ewe condition score will help us to achieve this gain.*
- *Because of the drought situation in year 2024, it's difficult to ascertain any improvement*
- *Biggest impact on lambing percentages for our region has been the complete lack of rainfall in 2024. With several below average years preceding this period.*

Comments in response to the question “What impact did implementing the above practices have on your ewe mortality rate (%)”

- *Lowest mortality rates this year. We adopted high protein vetch hay through mid to late pregnancy, and post birth.*
- *Minimal. Ewe mortality has stayed constant at 1-2%*
- *Not noticeable*
- *This year with feed nutrition delivery we had very low ewe mortality but it was one of the hardest more intense years we have had*
- *Dropped it by 2 to 3 percent*

- *Ewe mortality really low*
- *Feeding helped lower the rate.*
- *Decreased mortality by quite a bit*
- *slightly decreased ewe and lamb deaths*
- *Not sure yet*
- *it will lower our ewe mortality % in time*
- *Our Ewe mortality was very low, which was mainly due to supplementary feeding.*
- *Again, ewe mortality rate has been dictated by the complete lack of paddock feed available in 2024 rather than any changes to management practice. Unfortunately, no one in our local region can afford to focus on best management practices at the moment.*

5 Conclusion

Results over the three year PDS project indicate a positive response in reproduction success by implementing the best practice management strategies demonstrated across six sites in the Upper North of South Australia.

There was an improvement in lamb marking percentage across all sites compared to historic lambing results, but the extent of improvement was varied.

There were multiple best practice management strategies demonstrated at each site under the guidance of a livestock consultant for overall management of mobs. Therefore, increases in lambing percentages are difficult to attribute to one practice in isolation. Over the course of the project the seasonal variation was extreme which has contributed to some of the differences in results.

One of the aims of this project was to demonstrate the role that genetics can play in improving ewe reproduction and lamb survival and develop the knowledge, awareness, skills and attitudes of producers involved to enable them to more confidently select rams that will improve the reproductive performance and lamb survival of their flock. Whilst this was not measured directly, feedback from producer surveys and ongoing interest for more information from producers indicates success of this objective.

The undertaking of a cost benefit analysis aimed to provide producers with the confidence to consider implementing these principles to their enterprise. Economic gains were positive, however, there are many other benefits and outcomes discussed throughout the project with producers such as better overall management of ewes, health and welfare of sheep flocks and having a mechanism to build numbers when necessary.

The significant cost per ewe and lamb of implementing these management practices brings attention to the importance of comprehensive and adaptive management of the flock to make the most of the increased number of lambs on the ground to ensure profitability from positive results, for example, general health, drenching, correct nutrition and optimal weaning.

Whilst LOTSA Lambs PDS project sat under MLA's Producer Demonstration Site model, it has been delivered with a collaborative approach combining several UNFS projects with similar topics and messaging. The project often utilised resources from partner programs outside the PDS which aligned with the project and have helped leverage learning activities to achieve the objectives of this PDS, for example, the small group flock profiling extension work.

Engaging a livestock consultant at each session was key to the project's success. Their role was essential in providing technical, research and animal health information. Consultants involved in the

project included Deb Scammell (Talking Livestock), Andrew Michael (Leahcim Stud), Michelle Cousins (Cousins Merino Services) and Nathan Scott (Achieve Ag Solutions). Deb Scammell was a key facilitator at most extension activities providing consistency over the duration of the project. This approach influenced the overall outcomes of the project with a number of participants engaging livestock consultants privately for individual nutritional advice on farm to assist in implementing strategies covered at extension activities.

The PDS project has enabled demonstration site landholders to have individual sessions and ongoing support with Deb Scammell. These sessions planned for selective management of twin-bearing ewes, including ewe nutrition, condition scoring, feed budgeting, the impact of mob size, and effective confinement feeding based on the principles of Lifetime Ewe Management. Breeding objectives and genetic selections were taken into consideration at all demonstration sites as part of the management decisions. These one-on-one sessions on farm were crucial to the success in uptake of best practices on the demonstration properties.

Peer-to-peer learning was highly valued throughout this project. Extension activities were hosted on farm and designed alongside producers to create an open environment for participants to share their knowledge and experiences.

It proved difficult to compare and analyse trial results between farms due to the differences in the commercial nature of each enterprise such as time of lambing, timing of other animal husbandry, paddock sizes, genetics, feed on offer and shelter. A control flock at each demonstration site would have aided a better comparison and more robust cost: benefit analysis.

Improving lamb survival in the Upper North is often limited by paddock size and allocation of optimal paddocks to multiple bearing ewes can be difficult, especially in mixed cropping and sheep enterprises. There are compromises made by producers when it comes to feed on offer, shelter, topography, aspect and the lambing history of the paddock.

Practices demonstrated all had an increase in costs and cost:benefit was not always positive in the first year at individual sites but selective management of multiple bearing ewes in containment feeding and setting up optimal lambing paddocks for smaller mobs is an investment in the future to manage optimal stocking rates and establish resilience to drought conditions in the Upper North.

The project has had a positive impact on the reproductive rates of sheep in the region, showing producers that a 5-10% gain can be achieved and be profitable in the first year in many cases. Unfortunately, the region has been in significant drought in 2024 and most farmers in the region have destocked, however producers will be equipped with the skills and knowledge to build numbers when opportunities arise in more optimal seasons with more efficiency enabling a faster recovery from the drought. It has enabled Upper North farmers to increase their skills and knowledge to improve reproductive outcomes through better ewe management.

5.1 Key Findings

- Lamb survival percentage increased by an average of 8% compared to historical averages. This was associated with better overall management of ewes over the three years
- Knowledge, skill and practice change increased over the project in both core and observer producers in recommended management practices
- There is significant interest in the region in reproduction and lamb survival reflected in commitment by producers to the project and extension activities

- Sheep projects need sufficient time to see changes due to many factors influencing yearly results and the long-term implications of breeding changes
- Local producer groups and peer-to-peer discussions with access to researchers and technical experts leads to learning and adoption
- A collaborative approach across organisations helps to leverage learning activities and gain greater exposure to local producers
- Measuring and monitoring condition scoring is important for achieving improved lamb survival as well as general animal health
- Pregnancy scanning is essential for dividing ewes accordingly and for future management decisions
- The economic analysis showed an average $3.95 net benefit per ewe joined for selective management of multiple bearing ewes in containment and average $1.80 net benefit per ewe joined for running multiple bearing ewes in smaller mobs
- Four core producers and 18 observer producers were involved in the project
- A total of eight extension activities were delivered with a total attendance of 310
- 26 communication outputs were delivered to UNFS members and the wider farming community.

5.2 Benefits to industry

- Land Managers skilled in more effective and profitable overall management of sheep flocks
- Achieving higher stocking rates through a more targeted approach to managing ewes
- Increased awareness of the role of genetics in breeding resilient sheep for the Upper North
- Increased potential lamb marking or maintained marking percentages during very dry times
- Better utilisation of FOO in paddocks while sheep are in containment or smaller mobs
- Improved ground cover and soil preservation
- Improvement in ewe mortality due to improved ewe health improved during pregnancy and lambing
- Building the regions capacity to increase stock numbers after a poor season

6 References

Ashton, Dale Welsford-Brink, Quin and Ryder, Jay: Financial performance of livestock farms 2021–22 to 2023–24, ABARES2024

Hocking Edwards JE, Copping KJ and Thompson AN (2011) Managing the nutrition of twin bearing ewes during pregnancy using lifetime wool recommendations increases production of twin born lambs. Animal Production Science 51, 813-820

Lockwood A, Hancock S, Trompf J, Kubeil L, Ferguson M, Kearney G, Thompson A (2019) Data from commercial sheep producers shows that lambing ewes in larger mobs and at higher stocking rates reduces the survival of their lambs. New Zealand Journal of Agricultural Research 63, 1-14.

Brien FD, Hebart ML, Jaensch KS, Smith DH, Grimson RJ (2009) Genetics of lamb survival: a study of Merino resource flocks in South Australia. Proceedings of the Association for the Advancement of Animal Breeding and Genetics 18, 492–495.

7 Appendix

7.1 Communications Plan

Communications plan –

Project title: PDS: Lotsa Lambs – Improving Reproduction Success

Project No: L.PDS.2202

Prepared by: Rachel Trengove, rachel@unfs.com.au, 0438 452 003

Background

Upper North Farming Systems (UNFS) covers a diverse geographical area in the Upper North region of South Australia, bordered to the north and east by the pastoral zones and extending south to the higher rainfall zones. Members have a range of enterprises, dominated by cereal-sheep-legume rotations. Members are committed to improving enterprise sustainability, profitability, and viability in a low-medium rainfall environment.

Approximately 30 local producers have had an introduction to technology aimed at improving reproductive success of their sheep enterprise through their involvement with a PIRSA/MLA funded Red Meat and Wool Program Technology Group. As a 1-year project this has highlighted the options available, however further demonstration of these tools and technology in the field and extension of the cost benefit analysis will significantly increase the adoption rates.

Challenge/opportunity

As a result of the impact of drought, ewe numbers are low both locally and nationally. To facilitate the rebuild of the flock, it is necessary to produce more from the existing ewe base through maximising reproductive efficiency and minimising mortality. Seasonal conditions have led to many producers aiming for an autumn lambing to maximise feed available to lambs due to shorter springs and extended low feed on offer due to extended summer conditions. Producers are aware of the research that indicates higher lamb survival from twin bearing ewe flocks run as smaller groups at lambing. Most are unsure how to best implement this strategy, particularly in a mixed farming system with a focus on cropping.

On the ground solutions and demonstrations are required for producers to be able to see how this strategy could possibly work in their sheep flock. Many producers have adopted the strategy of feeding ewes in containment over summer and early autumn, often through much of their pregnancy. Common practice for a Nov-Dec joining is a 7-8 week joining period, and a lack of pregnancy scanning resulting in significant variation in nutritional requirements of the ewes at any one time. The adoption of early pregnancy scanning, scanning for multiples and condition scoring should allow targeted feeding of mobs while held in containment, and reduce problems such as dystocia due to over feeding of later lambing single bearers.

Project objectives

By December 2024, in the Upper North region of SA PDS: Lotsa Lambs will aim to achieve the following:

1. At two sites demonstrate the use of pregnancy scanning ewes in containment for foetus number and foetus age, as well as the use of condition scoring, and targeted feeding based on foetus number and stage of pregnancy to increase lamb and ewe survival rates by 10% by;

    i. More uniformly managing ewe condition score at lambing incl. setting targets, measurement, and adjusted management due to foetus number/age

    ii. Improve accuracy of feed budgeting

2. At two sites demonstrate management options for managing smaller mob sizes at lambing in a mixed cropping business and demonstrate a 5% increase in lamb survival when twin bearing ewes are lambed in smaller groups.

3. 75% of core producers will have a clear breeding objective and incorporate one or more of the following:

    1. Record and analyse data on ewe pregnancy history

    2. Merino Flock Profile for their flock

    3. Will track their ram team on RamSelect

    4. Consider ASBVs and indexes when purchasing rams

4. Implement skills and training development activities to increase the knowledge, skills and confidence of 27 producers in feed budgeting, condition scoring, and the use of ASBVs in breeding decisions so that 75% of core producers are implementing 1 or more of these practices in their enterprise.

5. Promotion to the wider group community through holding field days (1 per year), case studies (4) and technical reports (1 annually) and the established UNFS communication strategies including quarterly members' newsletter, UNFS Facebook and Twitter accounts, annual compendium and annual members' forums showcasing the project results and encourage adoption of key practices by livestock producers across the region and broader afield.

Target audience

Target audience for communication of PDS: Lotsa Lambs is sheep producers in the Upper North Region of South Australia. UNFS covers a diverse geographical area in the Upper North region of South Australia, bordered to the north and east by the pastoral zones and extending south to the higher rainfall zones, and encompasses the towns of Booleroo Centre, Crystal Brook, Hallet, Jamestown, Laura, Peterborough, Nelshaby, Orroroo, Quorn and Wilmington. The group has 140 members. As our membership base and other local farmers vary in age, Upper North Farming Systems will deliver these communication strategies in a number of ways to cater for a vast range of audience preferences with online updates, in person updates and in the form of articles and newsletters.

Key messages

- The Lotsa Lambs PDS project will demonstrate that the adoption of best practice management strategies including pregnancy scanning for multiples and early/late, selective management of pregnant ewes in containment, smaller mob size at lambing for twin bearers and genetic selection, can improve reproductive performance of sheep flocks in the Upper North of South Australia.
- The project involves a partnership between Upper North Farming Systems and local producers to demonstrate research findings on commercial properties.

- The 3-year project was initiated by Upper North Farming Systems.
- Producer Demonstration Sites are funded by MLA to support producers through peer-to-peer groups to pursue new skills, knowledge, and management practices applicable to their own commercial livestock production systems.
- The text "This Producer Demonstration Site is funded by Meat & Livestock Australia" will be included on all communication materials. MLA logo alongside UNFS logo will be used on all promotional material.

Channel/timing matrix

Timing	**Communications tactics (e.g. written producer case study, video)**	**Communications channel (e.g. Feedback magazine, media release)**	**Messages**
February 2022	PDS summary word document for expressions of interest to host site or be core producer	Email UNFS membership base, UNFS FB, Twitter to advertise opportunity to be involved	Information on aims and expectations of PDS and call for expressions of interest
Quarterly	Newsletter Article	Quarterly newsletter, sent out to membership base	Summary article of UNFS PDS progress
Feb/Mar 2022	Zoom Meeting	Zoom meeting to engage core producers and PDS hosts	Summary of aims and expectations of being involved in UNFS PDS
Annually	2 workshops and 1field day	Promoted through UNFS website, membership base through email and social media – both Facebook and Twitter. MLA project site sign hung on farm gate or fence of demonstration site Promoted through MLA events page	Flyer and invitation to be distributed Promotion of MLA funding
Annually	1 Technical report – document, collating and analysing demonstration site outcomes and activities.	Distributed through membership base and social media platforms, published in UNFS compendium. Available for publishing in MLA publications	Updates on PDS progress and results
December 2024	1 Producer guide/factsheet - document	Distributed through membership base and social media platforms, published in UNFS compendium. Available for publishing in MLA publications	Guide to managing ewes in confinement feeding over summer to maximise reproduction success with a planned autumn lambing. (using PDS findings)
2022 Dec x 1 2023 Dec x1	4 Case studies – document or video case study	Distributed through membership base and social media platforms,	Key messages and findings from PDS project

2024 Dec x2		published in UNFS compendium	

Outcome/measurements

Success of the communication plan will result in:

- Attendance of 10 or more core and observer producers at each workshop/field day
- Use and downloads of technical reports, producer guides and case studies
- Membership reach of newsletter articles
- Membership reach of workshops/field days
- Social media reach on all UNFS PDS related posts

Implementing the plan

Rachel Trengove, Upper North Farming Systems Project Officer will be responsible for implementing the communications plan. Assistance will be provided by subcontractors Michelle Cousins of Cousins Merino Services, Anne Collins of Anne Collins Consulting and Deborah Scammell of Talking Livestock Consulting. Support for this communications plan will be provided by the staff and Operations Committee members of Upper North Farming Systems.

Once you've developed your draft communications plan, please send it to the MLA Project Manager – Producer Demonstration Sites, Alana McEwan (amcewan@mla.com.au) and your relevant MLA PDS Coordinator. MLA PDS Project Manager will submit the plan to MLA Communications team for review and to provide feedback within three business days.

7.2 Monitoring Evaluation & Reporting plan

MER Plan: Producer Demonstration Sites

Project Number & Name: Lotsa Lambs – Improving Reproduction Success L.PDS.2202

Date: 14/02/22

Evaluation level	Project Performance Measures	Evaluation Methods
Inputs – What did we do? *Describe the planned and expected inputs involved in your project*, including *funds, resources, development & projects structures*	● Establish 2 demonstration sites for lambing in confinement ● Establish 2 demonstration sites for managing smaller mob size at lambing ● 150 producers will be observing the demonstration sites through the UNFS membership base ● 200 head mobs used for demonstration sites	○ Notification that sites will be needed for the 2022 season will be emailed out to UNFS operations steering committee and UNFS members. ○ Zoom meeting to inform interested parties of expectations and commitments of hosting a PDS

	● Project steering committee established ● 27 core producers engaged ● 30 observer producers engaged ● Pre and post surveys for core and observer producers ● Project steering committee established	○ Sites will be evaluated by mob size, yard set up, current adopted technology and suitable paddock arrangements. ○ Record of inputs and tracking of investment (including in-kind) with thorough budgeting ○ Project steering committee notes and decisions recorded and reported in progress reports ○ Pre-Project Surveys for core and observer producers collected, collated and analysed ○ Attendance and engagement monitored for each activity
Outputs - What did we do? *Describe the outputs planned/expected from your project, including engagement activities & products from demonstration sites*	● Outputs will include: ○ 2 paddock lambing demonstration site visits per year (1 at each site) ○ Successful demonstration of easily adopted management practices for running smaller mob sizes at lambing ○ 2 confinement lambing demonstration site visits per year (1 at each site) ○ Successful demonstration of the value proposition of managing ewes in containment based on their condition score, foetal number and age ○ Trial data collected for each demonstration site including:	○ Site visits will be conducted by the project manager with support of UNFS staff and promoted through social media and membership emails. ○ Media monitoring – monitoring of UNFS membership reach ○ Five workshops organised and attendance recorded, notes taken to capture anecdotal information from producers ○ Narratives from producers and anecdotal information and data recorded and utilised in progress reports and 4 case studies

	condition scores, pregnancy scanning data, ewe to ram ratios, feed budgets, feed ratio nutrition data, foetus number and age data, feed consumption, lamb survival ○ Observations in animal health and condition ○ Newsletter summaries including photos and PDS updates ○ Social media post ○ UNFS Membership emails ○ 1 Case studies at the end of each year to be published in the UNFS annual compendium and available for MLA publications ○ 2 workshops on Genetic factors of reproduction in year 2022 and 2023 ○ 3 workshops on ewe nutrition management in 3 years (one each year) ○ Profitability data – cost of production ($/kg meat) and gross margin data	○ PDS data collation and analysis ○ Cost of production ($/kg lamb produced) analysis ○ Gross Margin analysis ○ Attendance of field days, demonstration site visits and workshops
Changes in knowledge, attitudes, and skills - How well did we do it? *Describe the changes in KASA that you are planning to achieve*.	● An Increase in producer understanding of genetic implications in reproduction including the use of tools such as ASBV's the RamSelect App and Merino Flock Profiling ● Developed skills in producers in condition scoring, feed budgeting	○ Pre and post surveys of core and observer producers will capture changes in knowledge, attitudes, skills and confidence ○ Narratives and anecdotal information from core and observer producers collected at field days and workshops will give an

	and using genetics for improved productivity ● Positive attitude to and use of pregnancy scanning for multiples and foetal age, selective management of twin bearing ewes, condition scoring of ewes, use of and understanding of objective genetic selection and use of confinement feeding.	indication of changes achieved ○ Information collected for case studies and technical reports will also assist in evaluation of changes achieved
Practice changes – Has it changed what people do? *Describe the practice changes that you are expecting to achieve by the end of your project*	● Producers more uniformly managing ewe condition score at lambing including setting targets, measurement, and adjusted management due to foetus number/age ● Producers improving the accuracy of feed budgeting ● Producer adoption (or intention of adoption) of technologies and new practices as a result of the project such as MFP, RamSelect App, use of ASBV's and recording and analysing data on ewe pregnancy history.	○ Through the planned workshops, producers will be provided with the tools and knowledge to implement these changes on farm. ○ Pre and post surveys of core and observer producers will capture practice changes ○ Narratives and anecdotal information from core and observed producers collected at field days and workshops will give an indication of changes achieved ○ Information collected for case studies and technical reports will also assist in evaluation of changes achieved
Benefits – Is anyone better off? *Describe the benefits that you are expecting to achieve as a result of the project*	● Increase lamb and ewe survival rates by 10% when lambing in confinement ● Increase lamb survival by 5% when twin bearing ewes are lambed in smaller groups ● Overall increased productivity and profitability of sheep enterprises in the UNFS region as a result of the project	○ Cost:benefit analysis of the practices trialled in the project ○ Trial data on ewes and lamb numbers such as ewe condition score analysis, lamb survival rates, measurement of feed consumption

	● Improved animal health and condition	○ Simple Gross Margin and cost of production analysis
General observations / outcomes – Is the industry better off?	● Changes in producer's confidence to adopt practices demonstrated in the project for core and observer producers but also the wider farming community ● Rebuilding sheep numbers locally and nationally by producing more lambs from the existing ewe base ● Interest generated from published case studies and technical reports from the project to be circulated to the wider community after the project completion. ● Peer to peer learning at field days and workshops will broaden to general sharing of ideas and knowledge outside the topics of this project. ● Social networking for farmers in UNFS region ● Establishment of a like-minded group of producers who may continue to learn together into the future	○ Key lessons/learnings from UNFS demonstration sites can be used as an example in other areas with similar rainfall and farming systems ○ Media monitoring for UNFS as well as MLA platforms ○ Record steering committee communication and decision making ○ Capture anecdotal information from core and observer producers throughout the life of the project

7.3 Surveys

7.3.1 Pre-survey

MLA Producer Demonstration Sites - Pre-project Survey - Core Participants

PDS Name : PDS: Lotsa Lambs Improving Reproduction Success

PDS Project Code: L.PDS.2202

The following questions are used to determine your level of understanding of best practice management strategies for improving reproduction performance of sheep flocks . The knowledge and skills audit is used at the start and completion of the program to allow individuals to track their skill development and adoption of new practices. It will also be used:

1. To improve the content of future project meetings; and
2. As part of the evaluation process for the project

The information will be completely confidential, and individuals will not be identified in the analysis of data.

Participant Name: _____

Date: / /

MLA may contact me to further assess the impact of their programs? ○ Yes ○ No

MLA may send me newsletters and inform me of future events? ○ Yes ○ No

I have read, understood and accept the terms of MLA's "PDS Participant Consent & Release" (see appendix 1) ○ Yes ○ No

Participant Signature: _____

Section A – Demographic Information

A1. Your contact details

Company/Business Name: _____

Property Address:

(Incl. Property Name) _____

Name: _____

Phone Number: _____ **Mobile:** _____

Email Address: _____

Postal Address: _____

Are you a:

 Sheepmeat producer (>50% farm income)

 Beef producer (>50% farm income)

 Beef and/or sheep + cropping producer

 Other (please specify) _____

A2. Please tell us about your enterprise

Area Managed: ***(in hectares)***	***Number of beef breeders:***	***Number of cattle turned off per year:***	***Total Number of cattle:***

Number of Ewes:	***Number of lambs turned off each year***	***Total Number of Sheep***	***Number of goats turned off per year:***

Section B – Knowledge and Skills *(If you do not know, please select the 'Unsure' option)*

B1. How do you manage your current sheep flock? *(Tick one of the options below)*

a. One big mob ○
b. Several small mobs ○
c. Mobs based on age of ewes ○
d. Mobs based on paddock sizes available ○
e. Unsure ○

B2. What would you like to learn more about to achieve your breeding objective? *(Tick the answer that applies to you)*

a. Use of data on ewe pregnancy history ○
b. Merino Flock Profiling ○
c. Tracking ram team on RamSelect ○
d. Use of ASBV's and indexes when purchasing rams ○
e. Other – please describe ○
f. Unsure ○

B3. What do you consider the most important aspect in ewe and lamb survival? *(Tick the answer that applies to you)*

a. Ewe condition score ○
b. Mob sizes ○
c. Understanding ram genetics ○
d. Feed on offer for lambs ○
e. Separated management of single and twin bearing ewes ○
f. Other – please describe ○
g. Unsure ○

B4. What do you think is the optimum condition score for a ewe from joining to lambing? *(Tick the answer that applies to you)*

a. 1-2 ○
b. 3-3.5 ○
c. 4-5 ○
d. Unsure ○

B5. What factor most determines time of joining? *(Tick the answer that applies to you)*

a. Feed on offer for ewes ○
b. Feed on offer for weaned lambs ○
c. Feed on offer at time of lambing ○
d. Ewe condition ○
e. Unsure ○

B6. How would you rate your skills in condition scoring sheep? (where 1 is very poor and 5 is very good)

1. ○ 2. ○ 3. ○ 4. ○ 5. ○

B7. How would you rate your knowledge and understanding of ASBV's? (where 1 is very poor and 5 is very good)

1. ○ 2. ○ 3. ○ 4. ○ 5. ○

B8. How would you rate your knowledge and understanding of Merino Flock Profiling? (where 1 is very poor and 5 is very good)

1. ○ 2. ○ 3. ○ 4. ○ 5. ○

B9. How would you rate your knowledge and understanding of feed budgeting of pregnant ewes in containment? (where 1 is very poor and 5 is very good)

1. ○ 2. ○ 3. ○ 4. ○ 5. ○

Section C – Confidence and Practice.

C1. In relation to best practice management strategies to improve reproduction performance in your sheep flock, please rate your attitude, and confidence, where 1 being very poor and 10 being very good, by marking your choice below:

	1 Very Poor	2	3	4	5	6	7	8	9	10 Very Good
Attitude (Interest/Disinterest)										
Confidence										

C2. Do you currently use the following practices?

	Normal practice	Sometimes	Rarely	Never	Not Applicable
Pregnancy scanning of ewes for foetus number					
Pregnancy scanning of ewes for foetus age					
Targeted feeding based on foetus number					
Targeted feeding based on pregnancy stage					
Lambing in smaller mob sizes when twin bearing					
Use condition scoring of ewes					
Merino Flock Profiling					
Use of RamSelect to track your ram team					
Consider ASBV's when purchasing rams					

C2.1 What are the reasons you have not implemented the above practices on your property?

(Tick any of the options that apply to you)

 Not a significant issue on my property Lack of confidence Lack of skills

 Limited funds Limited time Other (please specify)

_____

C3. Are you already considering making any specific changes within your business relevant to the project?

	Already using the practice (Tick)	Likelihood of making this change:					
		Very unlikely	Unlikely	Possible need more information	Likely, with support/additional information	Likely	Very likely
Pregnancy scanning of ewes for foetus number							
Pregnancy scanning of ewes for foetus age							
Targeted feeding based on foetus number							
Targeted feeding based on pregnancy stage							
Lambing in smaller mob sizes when twin bearing							
Use condition scoring of ewes							
Merino Flock Profiling							
Use of RamSelect to track your ram team							
Consider ASBV's when purchasing rams							

C4. For the key metrics you are seeking to demonstrate in this PDS, please advise what is your current performance

Metric	**Current performance** (insert your metric)
Marking Percentage (% lambing at lamb marking)	
Labour efficiency (DSE/labour unit)	

Mortality rate (%)	
Feed conversion in confinement (kg feed/lamb marked)	
Cost of production ($/kg red meat)	
Gross margin / DSE or AE	

7.3.2 Post-survey

Post-Project Survey – Core/Observer Participants

PDS Project Code:	L.PDS.2202	**PDS Project Name :**	PDS: Lotsa Lambs – Improving Reproduction Success

The following questions are used to determine your level of understanding of improved reproductive performance following your participation in the above producer demonstration site project. The knowledge and skills survey is used at the start and completion of the program to allow individuals to track their skill development and adoption of new practices. The information will be used as part of the evaluation process for the project and MLA's PDS program. The information will be completely confidential, and individuals will not be identified in the analysis of data.

Participant Name: _____

Company/Business Name: _____

Section A - Your thoughts on the PDS

Please rate each of the questions below out of 10 (where 1 is negative and 10 is positive)

A1. Overall, how **satisfied** are you with this PDS? _____/10

A2. How **valuable** was this PDS in assisting you manage your livestock enterprise? _____/10

Please tick your response and provide short answer responses for the below questions

A3. Would you **recommend** MLA's PDS program to others? ☐ Yes ☐ No ☐ Not Sure

_____

_____

_____

_____

A4. Please provide any feedback to help us improve the PDS program:

Section B Knowledge and Skills

B1. Overall, how well has this PDS project increased your skills in condition scoring sheep?

Please rate out of 10 by marking your choice below, 1 = No Increase, 5 = very large increase

1	2	3	4	5
☐	☐	☐	☐	☐

B2. Overall, how well has this PDS project increased your knowledge and understanding of ASBV's?

Please rate out of 10 by marking your choice below, 1 = No Increase, 5 = very large increase

1	2	3	4	5
☐	☐	☐	☐	☐

B3. Overall, how well has this PDS increased your knowledge and understanding of Merino Flock Profiling?

Please rate out of 10 by marking your choice below, 1 = No Increase, 5 = very large increase

1	2	3	4	5
☐	☐	☐	☐	☐

B4. Overall, how well has this PDS increased your knowledge and understanding of feed budgeting of pregnant ewes in containment?

Please rate out of 10 by marking your choice below, 1 = No Increase, 5 = very large increase

1	2	3	4	5
☐	☐	☐	☐	☐

B8. What do you think is the optimum condition score for a ewe from joining to lambing? *(Tick the answer that applies to you)*

a. 1-2 ☐

b. 3-3.5 ☐

c. 4-5 ☐

d. Unsure ☐

Section C – Confidence and Practices

C1 How confident are you in relation to best practice management strategies to improve reproduction performance in your sheep flock?

Please rate out of 10 by marking your choice below, 1 = Not at all confident, 5 = somewhat confidence, 10 = very confident

1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

C2 As result of participating in this PDS have you adopted any of the following practices relevant to improved reproductive performance:

<table>
<tr><th>Practices</th><th>Practice Implemented?</th><th>Indicate on what % of your enterprise this practice has been adopted
(if not adopted leave blank)</th><th>Frequency of use?
(if not adopted leave blank)</th></tr>
<tr><td rowspan="2">Pregnancy scanning of ewes for foetus number</td><td>☐ Yes, practice implemented
☐ I intend to implement
☐ No, I have no intentions to
☐ Adopted prior to PDS
☐ Not applicable</td><td>☐ Less than 25%
☐ Between 25% - 50%
☐ 50%
☐ Between 50% - 75%
☐ Greater than 75%
☐ 100%</td><td>☐ Normal Practice
☐ Sometime
☐ Rarely</td></tr>
<tr><td colspan="3">What are the reasons you have not implemented this practice on your property?
☐ Not a significant issue on my property ☐ Lack of confidence ☐ Lack of skills
☐ Limited funds ☐ Limited time ☐ Other (please specify)</td></tr>
<tr><td rowspan="2">Targeted feeding based on foetus number</td><td>☐ Yes, practice implemented
☐ I intend to implement
☐ No, I have no intentions to
☐ Adopted prior to PDS
☐ Not applicable</td><td>☐ Less than 25%
☐ Between 25% - 50%
☐ 50%
☐ Between 50% - 75%
☐ Greater than 75%
☐ 100%</td><td>☐ Normal Practice
☐ Sometime
☐ Rarely</td></tr>
<tr><td colspan="3">What are the reasons you have not implemented this practice on your property?
☐ Not a significant issue on my property ☐ Lack of confidence ☐ Lack of skills
☐ Limited funds ☐ Limited time ☐ Other (please specify)</td></tr>
</table>

Lambing in smaller mob sizes when twin bearing	☐ Yes, practice implemented ☐ I intend to implement ☐ No, I have no intentions to ☐ Adopted prior to PDS ☐ Not applicable	☐ Less than 25% ☐ Between 25% - 50% ☐ 50% ☐ Between 50% - 75% ☐ Greater than 75% ☐ 100%	☐ Normal Practice ☐ Sometime ☐ Rarely
	What are the reasons you have not implemented this practice on your property? ☐ Not a significant issue on my property ☐ Lack of confidence ☐ Lack of skills ☐ Limited funds ☐ Limited time ☐ Other (please specify)		
Use condition scoring of ewes	☐ Yes, practice implemented ☐ I intend to implement ☐ No, I have no intentions to ☐ Adopted prior to PDS ☐ Not applicable	☐ Less than 25% ☐ Between 25% - 50% ☐ 50% ☐ Between 50% - 75% ☐ Greater than 75% ☐ 100%	☐ Normal Practice ☐ Sometime ☐ Rarely
	What are the reasons you have not implemented this practice on your property? ☐ Not a significant issue on my property ☐ Lack of confidence ☐ Lack of skills ☐ Limited funds ☐ Limited time ☐ Other (please specif		
Merino Flock Profiling	☐ Yes, practice implemented ☐ I intend to implement ☐ No, I have no intentions to ☐ Adopted prior to PDS ☐ Not applicable	☐ Less than 25% ☐ Between 25% - 50% ☐ 50% ☐ Between 50% - 75% ☐ Greater than 75% ☐ 100%	☐ Normal Practice ☐ Sometime ☐ Rarely
	What are the reasons you have not implemented this practice on your property? ☐ Not a significant issue on my property ☐ Lack of confidence ☐ Lack of skills ☐ Limited funds ☐ Limited time ☐ Other (please specify)		

<table>
<tr><td rowspan="2">Use of RamSelect to track your ram team</td><td>☐ Yes, practice implemented
☐ I intend to implement
☐ No, I have no intentions to
☐ Adopted prior to PDS
☐ Not applicable</td><td>☐ Less than 25%
☐ Between 25% - 50%
☐ 50%
☐ Between 50% - 75%
☐ Greater than 75%
☐ 100%</td><td>☐ Normal Practice
☐ Sometime
☐ Rarely</td></tr>
<tr><td colspan="3">What are the reasons you have not implemented this practice on your property?
☐ Not a significant issue on my property ☐ Lack of confidence ☐ Lack of skills
☐ Limited funds ☐ Limited time ☐ Other (please specify)</td></tr>
<tr><td rowspan="3">Consider ASBV's when purchasing rams</td><td>☐ Yes, practice implemented
☐ I intend to implement
☐ No, I have no intentions to
☐ Adopted prior to PDS
☐ Not applicable</td><td>☐ Less than 25%
☐ Between 25% - 50%
☐ 50%
☐ Between 50% - 75%
☐ Greater than 75%
☐ 100%</td><td>☐ Normal Practice
☐ Sometime
☐ Rarely</td></tr>
<tr><td colspan="3">What are the reasons you have not implemented this practice on your property?
☐ Not a significant issue on my property ☐ Lack of confidence ☐ Lack of skills
☐ Limited funds ☐ Limited time ☐ Other (please specify)</td></tr>
<tr><td colspan="3"></td></tr>
</table>

C3. Have you made/do you intend to make any other changes to your business as result of participating in this PDS? *If yes, please advise what changes*

_____

_____

_____

C4. What impact did implementing the above practices have on *(Please do not answer if you are unsure)***:**

Marking Percentage (% lambing at lamb marking) _____

Ewe Mortality rate (%) _____

Consent to contact

MLA may contact me to further assess the impact of their programs? ☐ Yes ☐ No

MLA may send me newsletters and inform me of future events? ☐ Yes ☐ No

I have read, understood and accept the terms of MLA's "PDS Participant Consent & Release" (Click Here) ☐ Yes ☐ No

Participant Signature: _____

Property Address:
(Incl. Property Name) _____

Phone Number: **Mobile:** _____

Email Address: _____

7.4 Communication Outputs

7.4.1 Expressions of interest emails sent out to UNFS distribution list

We have been lucky to acquire funding from Meat and Livestock Australia (MLA) for two producer demonstration sites in our Upper North region over the next three years! This is an exciting opportunity for our sheep producers to come together and share knowledge as well as learn from industry experts. There are two demonstration projects described below. PDS 1: Improved Pasture Systems will be run by Morgan McCallum and PDS 2: Lotsa Lambs – Improving Reproduction Success will be run by Rachel Trengove. They will be run in conjunction with each other and over the same time period.

We are looking for producers who are keen to be involved and provide paddocks and data to use for the purpose of demonstrating to other producers.

There will also be an opportunity to come on board as a member of our learning group and attend workshops and demonstration site visits.

PDS 1: Improved Pasture Systems

Aim: Demonstrate that a better understanding of the Food on Offer and the provision of a more diverse pasture for grazing can result in improved animal health and overall performance of sheep as well as:

1. Demonstrate whether a mix of pasture species can provide more FOO than a monoculture and result in improved animal health and performance?
2. Can satellite monitoring of pasture biomass improve feed budgeting?

This trial will be over a three year period, with 3 separate demonstration sites per year.

How the demonstration site will look:

The demonstration site will have a paired sites approach, meaning we will have two treatments next to each other, minimum of 10 ha in size each (overall site will need to be 20 ha in size). Seed will be supplied by the local farmer and seed suppliers will be invited to participate in the program and given the opportunity to supply seed under a partnership agreement (as per with all other UNFS seeding trials).

Some proposed treatments are for this demonstration:

i. Vetch and Vetch/Barley – Barley removed post grazing
ii. Medic and Medic/Wheat – Wheat removed post grazing
iii. Oats and Oats/Canola – Canola may be removed post grazing if hay production is desired.

- Other options include but are not limited to that may be implemented by the farmer depending on the seasonal / paddock conditions and the availability of seed:

iv. Vetch and Vetch/Forage Brassica
v. Vetch and Vetch/Tillage Radish

There will be a range of assessments that will need to be carried out, including weighing and condition scoring of sheep onto and off of the demonstration site as well as in season pasture measurements.

We are looking for three demonstration sites for the 2022 season that can accommodate this demonstration and possibly a producer that is currently already doing mixed species pasture cropping. A minimum 20ha paddock will be needed that has the capacity to be split into two. Sheep yards with a scale setup will also be needed as sheep will need to be weighed on and off the demonstration site pre and post grazing

PDS 2: Lotsa Lambs

This project will aim to demonstrate that the adoption of best practice management strategies can improve reproductive performance of sheep flocks in the Upper North of South Australia.

How the demonstration site will look:

We require 4 demonstration sites in total for this project:

Two sites with an extended joining and containment feeding of pregnant ewes to demonstrate over 2 lambing cycles the value of:

i. Reduced joining period to 5-6 weeks
ii. Correct ewe to ram ratios
iii. Managing and feeding mobs separately based on condition score, foetus number and foetus age.
iv. Matching nutrition needs to rations

We will be measuring feed consumption, lamb survival and ewe condition score as well as analysing grows margins and cost of production.

Two sites for improved pregnant ewe management over 3 lambing cycles incorporating:

i. Development of a clear breeding objective including improved genetic data and decision making

ii. Pregnancy scanning
iii. Splitting twin bearing ewes into smaller groups for lambing.
iv. Ewe condition scoring and segregation within single bearing ewes based on condition.

We will be measuring ewe condition scores, lamb survival and assessing the cost:benefit of the practices.

As a producer providing a demonstration site you will get exclusive access to satellite mapping of the selected demonstration paddock, one on one consultant advice and access to support and training workshops with keynote speakers.

If you would like to be involved with this PDS please do not hesitate to contact Morgan at morgan@unfs.com.au 0459718181 or Rachel Trengove rachel@unfs.com.au 0438452003

7.4.2 Project summary – MLA website Lotsa Lambs - Improving Reproduction Success | Meat & Livestock Australia

Lotsa Lambs - Improving Reproduction Success | Meat & Livestock Australia

7.4.3 Article introducing the PDS hosts and locations and Lotsa Lambs objectives and key practices being demonstrated.

MLA PDS: Lotsa Lambs – Improving Reproduction Success—Trial Update - Rachel Trengove

UNFS has implemented two demonstration sites this year for PDS: Lotsa Lambs. Sheep producers Alison Henderson located near Caltowie, and Andrew Kitto near Gladstone. Sheep were pregnancy scanned and split into single and multiple bearing ewes. The scanned multiples were then split into smaller mobs for lambing. Lamb marking and weaning data will be collected for each mob to assess lamb survival rates as a result of these management practices. The aim of these two sites is to demonstrate that the adoption of best management strategies including pregnancy scanning and selective management of singles and multiples as well as smaller mob sizes at lambing for multiple bearers, can improve the reproductive performance of sheep flocks in the Upper North of South Australia.

Two additional sites will be established next year as part of PDS: Lotsa Lambs, focusing on ewes in confinement. These sites will be located at Caleb Girdham's property at Melrose and William and James Heaslip's property at Appila and aim to demonstrate the selective management of single and multiple bearing ewes in containment using condition scoring and targeted feeding in order to increase lamb and ewe survival rates.

Workshops, field days, site visits and case study reports over the next two years will provide a learning opportunity around improving sheep reproduction success for sheep producers in the Upper North. If you'd like any additional information about the project or would like to be involved, please contact Project Officer - Rachel Trengove, 0438452003, rachel@unfs.com.au

7.4.4 Event summary – Session 1: Improving Reproductive Success

Published UNFS Newsletter Sept 2022

PDS: Lotsa Lambs – Improving Reproduction Success

PDS Lotsa Lambs ran its first workshop on 28th June in Don Bottrall's shearing shed, followed by a visit to Alison Henderson's farm which is one of our Lotsa Lambs Producer Demonstration Sites (PDS). Guest speakers for the day were Michelle Cousins, Cousins Merino Services, Andrew Michael, Leahcim Stud, Snowtown and Alison Henderson, Caltowie.

Michelle shared her extensive experience on how to get the most from pregnancy scanning including benefits of splitting single and twin bearing ewes and managing smaller mob sizes at lambing. She said that pregnancy scanning gives producers a good indication of reproduction potential which allows them to realise any production loss that is occurring and manage those factors accordingly. It provides the baseline data to make decisions to improve productivity. Twin lamb survival rates is where Michelle sees significant losses and therefore potential gains to be made in this area with the feed on offer being a crucial factor for twin bearing ewes. EID use can provide easier management of underperforming ewes when it comes to reproduction success. Michelle showed evidence from research of a direct correlation between larger mob sizes and reduced lamb survival in the order of a 2-2.5% reduction in survival for every 100 ewe increase. Around the 200 ewe mob size was recommended to reduce mismothering. Paddock type is very repeatable for lamb survival, for example 130% survival will be repeated year after year and can be used in decision making around management of lambing mobs.

Andrew brought a wealth of knowledge to the day and shared his experience in genetic improvement in sheep. In Andrew's opinion, flock profiling is money well spent. He showed evidence of profitability as a result of selecting on genetics and how we can use our flock profiling results to value add. As a start, undertaking flock profiling on lambs or hoggets was recommended, followed by ram selection accordingly and then re-testing 3 years later to track genetic progress. Hoggets need to be DNA tested before classing to ensure a true representation of your current genetics. Andrew ran through a demonstration of interpreting flock profiling results and use of the RamSelect App. He said that ram selection is arguably the biggest genetic gain in your flock and use of ASBV's can speed up genetic improvement, however phenotype still needs to be considered in the selection process. Since the workshop, a group of nine producers have decided to do flock profiling on their sheep and we will meet at the beginning of September with Andrew to guide us though interpretation of results and set a clear breeding objective.

Alison Henderson also presented at our workshop giving an insight into their business and sheep enterprise and sharing her experiences with improving genetics in her flock. Alison emphasised the importance of establishing a clear breeding objective. She said that if she is going to push for improved reproduction there will be sacrifices in other areas, but the breeding objective ensures a balance is met. Management of her flock is based on Lifetime Ewe Management Principles (LTEM) and most of the concepts discussed during the workshop have already been adopted by Alison giving the group a great practical overview of benefits of best practice in sheep production. We visited the PDS site nearby to Don's shed where electric fencing has been used to reduce paddock size in order to run lambing ewes in smaller mobs. Water points were placed in the middle of paddocks, parallel to the electric fencing, running the wire across the trough which has worked well for the lambing period.

UNFS has implemented two demonstration sites for PDS: Lotsa Lambs so far, sheep producers Alison Henderson located near Caltowie and Andrew Kitto near Gladstone. Sheep were pregnancy scanned and split into single and multiple bearing ewes. The scanned multiples were then split into smaller mobs for lambing. Lamb marking and weaning data will be collected for each mob to assess lamb survival rates as a result of these management practices. The aim of these two sites is to demonstrate that the adoption of best management strategies including pregnancy scanning and selective management of singles and multiples as well as smaller mob sizes at lambing for multiple

bearers, can improve the reproductive performance of sheep flocks in the Upper North of South Australia.

Two additional sites will be established next year as part of PDS: Lotsa Lambs, focusing on ewes in confinement. These sites will be located at Calebs Girdham's, Melrose and William and James Heaslip's Appila and aim to demonstrate the selective management of single and multiple bearing ewes in containment using condition scoring and targeted feeding in order to increase lamb and ewe survival rates.

Workshops, field days, site visits and case study reports over the next two years will provide a learning opportunity around improving sheep reproduction success for sheep producers in the Upper North. If you'd like any additional information about the project or would like to be involved, please contact Project Officer - Rachel Trengove, 0438452003, rachel@unfs.com.au

7.4.5 Session 2: Flock Profiling

7.4.5.1 Breeding Objective Handout

Breeding objectives and selection

A breeding objective defines the 'ideal' animal a producer aims to breed and selection is the method by which the producer identifies that animal.

All breeding enterprises should establish breeding objectives and goals and implement selection processes to meet those objectives as part of the overall business planning process.

Breeding objectives

A breeding objective describes characteristics that affect profit the most, as well as how important each trait is to profit. A breeding objective should be specific, measureable and attainable.

When developing breeding objectives consider:

- A breeding objective is generally specific to a particular market, therefore it is important to understand customer and market requirements.
- Depending on the target market, some traits or characteristics have greater economic importance than others eg growth rate as an influencer of live weight at sale.
- Monitoring the current herd or flock performance against customer or market requirements and considering how this performance and the requirements might change over time.
- Some traits are highly heritable or readily passed on from one generation to another. Greater progress towards breeding objectives can be achieved by targeting traits that are highly heritable.
- Focus on traits of economic importance rather than traits that have more to do with 'tradition' or 'personal preference'.

A breeding objective can be simple eg breed, or more sophisticated eg fat depth.

Regardless of the level of sophistication, it is important to record or list the desired animal traits that impact on enterprise profitability and estimate the relevant importance of each trait. From here the economic impact of changing each important trait can be calculated from financial and production data.

Tools exist to help producers develop breeding objectives:

- A number of breed societies have generic, market-based breeding information available on their respective websites.
- BreedObject is a software package that helps producers establish breeding objectives.

Selection

Once producers understand the requirements of the target market and have developed breeding objectives that are aligned to these requirements, they can begin selecting livestock that meet the breeding objectives.

Selection describes the process of choosing animals that meet the requirements of the breeding objective and will, in a breeding enterprise, pass particular traits onto their progeny. Selection should consider both subjectively measured traits (visual assessment) and objectively measured traits (genetic assessment).

Subjective, visual assessment

Visual assessment is an assessment of an animal based on what can be physically seen. While the requirements will vary depending on the enterprise's breeding objectives, traits to look for when visually assessing livestock include:

- The conformation or shape of the animal eg muscling.
- Structure of the animal eg whether the mouth is overshot or undershot.

Objective, genetic assessment

Objective assessment uses actual measurements to assess the relative worth of an animal to an enterprise. One form of objective assessment is genetic evaluation which provides an insight into the genetic makeup of animals. This is particularly useful when sires are being acquired to improve a herd or flock according to the enterprises breeding objectives.

The difficult task of selecting breeding stock based on genetic assessment has been made easier and more precise through estimated breeding values (EBVs) (cattle and goats) and Australian sheep breeding values (ASBVs) (sheep).

Breeding values are calculated using information from each animal's own performance and from the performance of its relatives. This information can help select and breed livestock that will achieve performance targets and improve profitability.

Breeding, classing and culling

Classing and culling play an important role in improving the average genetic merit of a herd or flock.

Producers can class livestock and cull where necessary to achieve market specifications and the enterprises breeding objectives. This may occur prior to selling and be based on factors such as condition score, or prior to breeding and consider more fundamental conformational or genetic traits.

Regardless of when classing occurs, target market specifications should play a major role in the process.

More information

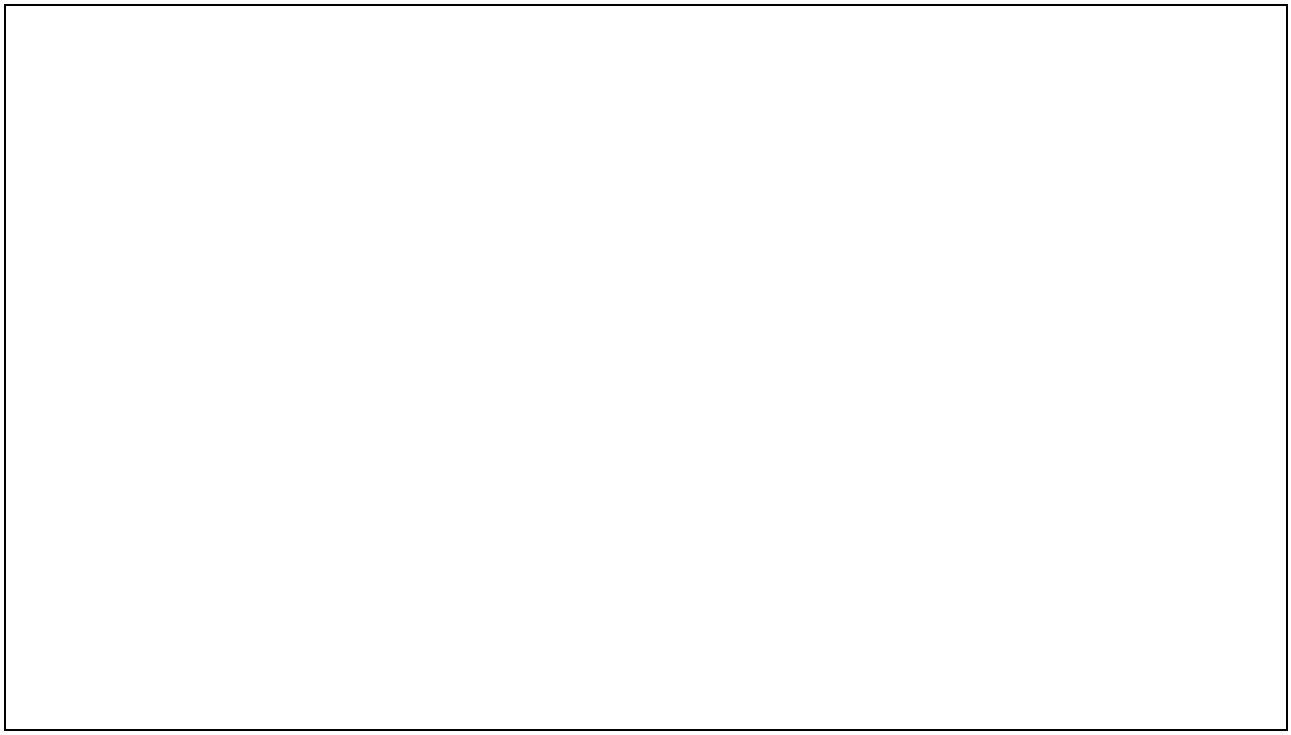
- Genetic evaluation:

  - Cattle producers - BREEDPLAN
  - Sheep producers - LAMBPLAN
  - Goat producers - KIDPLAN
  - Merino breeders and wool growers - MERINOSELECT
- BreedObject
- NSW Industry & Investment - Visual and manual assessment of fatness in cattle
- Australian Registered Cattle Breeders Association
- Australian Stud Sheep Breeders Association
- Goat Industry Council of Australia

FLOCK PROFILING SESSION – 19th SEPTEMBER 2022 with Andrew Michael

Interpretation of DNA testing results:

Producer Breeding Objective:



7.4.6 Event summary – Session 4: Implementing eID's on farm and Improving reproductive success

UNFS Newsletter article Published Feb/March 2023

7.4.7 LOTSA Lambs annual report – UNFS Compendium publication

PDS: LOTSA LAMBS – Improving Reproduction Success – 2023 Update

Author: Rachel Trengove
Funded By: Meat & Livestock Australia (MLA)
Project Title: PDS: LOTSA LAMBS – Improving Reproduction Success
Project Duration: Feb 2022 – Feb 2025
Project Delivery Organisations: UNFS, Talking Livestock

Background

As a result of the impact of drought, ewe numbers are low both locally and nationally. To facilitate the rebuild of the flock, it is necessary to produce more from the existing ewe base through maximising reproductive efficiency and minimising mortality. Seasonal conditions have led to many producers aiming for an autumn lambing to utilise feed available to lambs due to shorter springs and extended low feed on offer due to extended summer conditions. Producers are aware of the research that indicates higher lamb survival from twin bearing ewe flocks run as smaller groups at lambing. Most are unsure how to best implement this strategy, particularly in a mixed farming system with a focus on cropping. On the ground solutions and demonstrations are required for producers to be able to see how this strategy could possibly work in their sheep flock.

Many producers have adopted the strategy of feeding ewes in containment in late summer and early autumn, often through much of their pregnancy. Common practice for a Nov-Dec joining is a 7-8 week joining period, and a lack of pregnancy scanning resulting in significant variation in nutritional requirements of the ewes at any one time. The adoption of early pregnancy scanning, scanning for multiples and condition scoring should allow targeted feeding of mobs while held in containment, and reduce problems such as dystocia due to over feeding of later lambing single bearers.

Part of this project will look at improved genetic selection in commercial flocks, incorporating data collection and analysis on reproduction success, understanding ram genetics and Merino Flock Profiling (MFP). The aim being to refine breeding objectives and plan for future breeding decisions with fertility in mind, including an understanding of the traits to focus on, to breed robust animals for UNFS production systems.

Methodology

Review and demonstrate:

1. At two sites demonstrate the value of;
    i. reduced joining period to 5-6 weeks
    ii. correct ewe to ram ratios
    iii. managing and feeding mobs separately based on condition score and foetus number.
    iv. matching nutrition needs to rations

Measure feed consumption, lamb survival and ewe condition score. Analyse gross margins and cost of production ($/kg lamb produced). Record other observations of variations in animal health and condition. (2 lambing cycles).

2. Establish two demonstration sites for improved pregnant ewe management incorporating:
    i. Development of a clear breeding objective including improved genetic data and decision making
    ii. Pregnancy scanning
    iii. Splitting twin bearing ewes into smaller groups for lambing.
    iv. Ewe condition scoring and segregation within single bearing ewes based on condition.

Measure lamb survival and assess the cost:benefit of the practices. Record other observations of variations in animal health and condition. (3 lambing cycles)

Run 5 extension activities for UNFS members. The workshops to be delivered by recognised industry experts in condition scoring, feed budgeting, impact of mob size, effective confinement feeding, using ASBVs and the RamSelect app, breeding objective development and interpreting Merino Flock Profile results. Principles will be based on the AWI Life Time Ewe Management Course content.

Results

Table 1. Lamb marking results – multiple and single bearing ewes

	Number of lambs	Number of ewes	% Lambing	Industry Target % (sheep connectSA website)

Site 1				
Singles 2022	68	62	110%	92%
Multiples 2022	150	128	117%	150%
		AV	115%	
Site 1				
Singles 2023	71	65	109%	92%
Multiples 2023	104	76	137%	150%
		AV	124%	
Site 2				
Singles 2022	124	139	89%	92%
Multiples 2022	198	225	88%	150%
		AV	88%	
Site 2				
Singles 2023	327	232	141%	92%
Multiples 2023	453	292	155%	150%
		AV	149%	
Site 3				
Singles 2023	333	322	103%	92%
Multiples 2023	299	181	165%	150%
			126%	

Note: Ewe deaths & drys removed from data

Site 1 and 2

Two demonstration sites were provided by Upper North producers located at Gladstone and Caltowie to implement the practice of pregnancy scanning and lambing multiples in smaller mobs. The demonstration sites ran twin-bearing ewes in mobs of 100 or fewer during lambing to reduce the risks of mismothering, ewe-lamb separations, and lamb mortality. 2022 presented challenging lambing conditions at the demonstration properties due to a late break in the season, lack of feed on offer for pregnant ewes and harsh cold conditions during lambing. Adequate shelter is a limiting factor for both site 1 & 2 and was reflected in poorer results in 2022 compared with 2023, as shown in Table 1.

Site 1 showed an increase in lamb survival in 2023 from already strong results in 2022. Site 2 showed the most significant improvement in lamb survival from 2022 to 2023. Smaller paddocks were available at site 2 in 2023 which enabled mob size to be further reduced for twin bearing ewes. Additionally, ewe mortality decreased at site 2 in 2023.

Environmental factors also played a role in positive results in 2023, with an earlier break in the season providing nutritional green pick for pregnant ewes and lambs and as well as milder weather conditions at the time of lambing. Ewes were supplementary fed at both sites for 2022 and 2023 with rations provided as part of the project for consistency.

Site 3.

Feedtests on hay, grain and pastures were conducted and rations provided for optimal ewe health during pregnancy. Ewes were pregnancy scanned and twin bearing ewes split into mobs of less than 100. Lambing results were above industry targets at this site, indicating that implementing practices such as pregnancy scanning, matching nutrition with pregnancy status and lambing twin bearing ewes in smaller mobs results in improved reproductive success. Single bearing ewes had an average condition score of 3, and twin bearing ewes were 3.5 which was ideal condition for ewes pre-lambing as a result of tailoring supplementary nutrition to ewe needs as well as seasonal conditions being favourable with good feed on offer in 2023 at the time of late pregnancy and lambing.

Discussion

The PDS project has enabled demonstration site landholders to have individual sessions and ongoing support with Deb Scammell from Talking Livestock. These sessions plan for selective management of twin-bearing ewes, including ewe nutrition, condition scoring, feed budgeting, the impact of mob size, and effective confinement feeding based on the principles of Life Time Ewe Management. Breeding objectives and genetic selections have been taken into consideration at all demonstration sites as part of the management decisions.

Segregation of ewes within mobs based on condition score was recommended but not always practical or possible due to paddock availability at the demonstration sites. If there is too much of a range in condition scores while supplementary feeding, it can affect ewe mortality, lamb birthweights and survivability This could have improved lambing results further and is a management practice that could be considered by these producers into the future.

Overall, results so far indicate that reproduction success can be maximised by implementing the best practice management strategies demonstrated in this project. This demonstration will continue in 2024, with additional confinement feeding sites in the project. Undertaking a cost benefit analysis will provide producers with the confidence to consider implementing these principles to their enterprise.

Image 1: 2023 PDS landholders – Alison Henderson, Lachie Smart, Andrew Kitto and Nathan May with Rachel Trengove, UNSF and Deb Scammell, Talking Livestock.

Image 2: Workshop 4 at Lachie Smart's farm, Wirrabara – Containment feeding pregnant ewes and lambing in smaller mobs demonstration.

Image 3: Workshop 4 – Rachel Trengove and Deb Scammell collecting feed samples in Lachie Smart's lambing paddock.

Image 4: Workshop 4 – Guest presenters – Colin Trengove, ProAg Consulting, Caitlin Evans, Adelaide University, Jessie White, Northern & Yorke Landscape Board, Deb Scammell, Talking Livestock, Rachel Trengove, UNFS and Lachie Smart, PDS landholder, Wirrabara.

Image 5: Workshop 4 – Guest presenters – Colin Trengove, ProAg Consulting, Deb Scammell, Talking Livestock, Megan Tscharke, Adelaide University with Rachel Trengove, UNFS and workshop hosts, Michael & Katherine Battersby.

Image 6: Pregnancy scanning at Andrew Kitto's farm to split twin bearing ewes into smaller mobs.

Table 1. Summary of the extension activities undertaken in 2023 for PDS: LOTSA LAMBS

Activity	Date & Location	Workshop Objective	Activity Description
Workshop 3: Implementing eID's on farm	23rd February 2023	To provide a hands-on demonstration by	**NATHAN SCOTT (Achieve AG Solutions) – eID – what's**

and Improving Reproductive Success	Caleb Girdham's farm, Melrose	presenter and farmer on how to incorporate technology into containment yard design as well as implementation of eID's on farm for efficiency and productivity outcomes.	**in it for me?** The what, how, and why (or why not) of applying it practically on your farm. • Equipment options • How the technology works • What data to collect • Understanding the implications of applying selection pressure • How to collect data & tips on managing data **DEB SCAMMELL (Talking Livestock) – Improving Reproductive Success** • Pregnancy requirements & this season's feed • The fit of containment this year • Containment costs $$ - benefits and feed on offer – the data FREE FEED TEST WAS AVAILABLE FOR ALL PARTICIPANTS STICKY BEAK AT GIRDHAM'S AUTODRAFTER, YARDS AND CONTAINMENT FEEDING SET UP CO-FUNDED WITH N&Y LANDSCAPE BOARD
Workshop 4: LOTSA LAMBS Improved Weaner Management	9th June 2023 Smarts Farm, Wirabara 20th June 2023 Battersby's Farm, Wilmington	For guest presenters and sheep experts to provide valuable insights and guidance on optimizing weaner management practices such as nutrition, health, and other relevant topics.	**Deb Scammell, Talking Livestock** • The weaning process • Weaner growth targets • Weaner nutrition & maximising spring feed • Successful breeders from weaners

			Colin Trengove, ProAg Consulting • Strategies to optimize weaner health • Preventing worms and other common challenges **Adelaide University - Heat Stress in Sheep project in the Upper North** • Managing heat stress in sheep • The benefits of using vitamins & melatonin (Regulin) to improve the productivity of sheep during periods of heat • Results from the Upper North FREE FEED TEST WAS AVAILABLE FOR ALL PARTICIPANTS STICKY BEAK AT SMART'S AND BATTERSBY'S YARDS AND CONTAINMENT FEEDING SET UP CO-FUNDED WITH N&Y LANDSCAPE BOARD

Acknowledgements:

- Thank you to the 2023 demonstration site landholders for sharing data and hosting workshops – Alison Henderson, Andrew Kitto & Nathan May and Lachie Smart
- This Producer Demonstration Site is funded by Meat & Livestock Australia.

7.4.8 General LOTSA LAMBS Project Update – sites and seasonal conditions

UNFS Newsletter article published June 2023

7.4.9 Article: Event summary - Session 5: PDS LOTSA Lambs Workshop- Improved Weaner Management – Wirrabara and Wilmington

UNFS Newsletter article published September 2023

7.4.10 Article MLA PDS Updates - May 2023

Implementing eID's on-farm and improving reproductive success | Meat & Livestock Australia

7.4.11 CaPhoto pictorial: LOTSA Lambs PDS Project update –'The season for pregnancy scanning and condition scoring'

LOTSA Lambs PDS Project update – April 2024 – The season for pregnancy scanning and condition scoring.

Photos: Andrew Kitto having a quick refresher with Deb Scammell on Condition Scoring Ewes at pregnancy scanning.

Photo: Preg scanning Andrew Kitto's ewes, Gladstone

Photo: Thank you to David Moore, Jamestown, for coming on board the LOTSA Lambs project as a containment feeding demonstration site for 2024

Photo: David and Jamie condition scoring ewes with Deb Scammell as part of the LOTSA Lambs project

This Producer Demonstration Site is funded by Meat & Livestock Australia.

7.4.12 LOTSA Lambs annual report – UNFS Compendium publication 2024

2024 UNFS Compendium will be published here from August 2025.

7.4.13 Event summary & photos Session 8: Livestock strategies for the next 100 days

In August UNFS held a Sticky Beak at David Moore's containment feeding set-up. With a challenging start to the season, it was a great opportunity to get like-minded people in the area together and hear from topic experts on developing livestock strategies going forward. The workshop was part of a sheep containment feeding pilot program with SA Drought Hub and supported by Livestock SA. David Moore's containment feeding site has been a demonstration site this year for the LOTSA Lambs PDS project funded by MLA. The site aims to demonstrate the use of pregnancy scanning ewes in containment for foetus number as well as the use of condition scoring, and targeted feeding based on foetus number to increase lamb and ewe survival rates.

Thank you to our guest speakers; Felicity Turner, Deb Scammell & Ken Solly.

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7.4.14 Report on Merino Flock Profiling Workshop (Session 9) – publication in conjunction with PIRSA's Wild Dog & Livestock Productivity Project

UNFS Newsletter article published Spring 2024

7.4.15 Article MLA PDS Updates - May 2025

Focus on multiples delivers Moore lambs | Meat & Livestock Australia

7.5 Project Fact sheet & Case studies

7.5.1 Case Study 1 – Andrew Kitto

Image	Caption
	SA livestock consultant Deb Scammell, pictured with Gladstone sheep producers Andrew Kitto (left) and Nathan May. Image: Rachel Trengove, UNFS
	Upper north SA sheep producers Andrew Kitto and his son-in-law Nathan May implemented lambing twin bearing ewes in smaller mobs as part of an MLA PDS in 2022–24. Image: Rachel Trengove, UNFS
	Andrew Kitto and Deb Scammell condition score ewes as part of the PDS. Image: Rachel Trengove, UNFS
	Andrew Kitto condition scores ewes as a strategy to lift reproductive performance. Image: Rachel Trengove, UNFS

More information	Key resources
Rachel Trengove rachel@unfs.com.au **Andrew Kitto** ajmkkitto@bigpond.com	• **MLA Producer Demonstration Sites**: mla.com.au/pds • **Lifetime Ewe Management**: wool.com.au/ltem
On-farm snapshot	
Name/s	Andrew and Maria Kitto, Nathan and Rachel May
Location	Gladstone, SA
Area in hectares	830ha owned and 200ha of agistment (plus additional opportunistic agistment)
Enterprise	Sheep and cropping
Pastures	20% grazing (hills country with perennial pastures plus sown pastures on some arable country) 80% cropping (cereals, lentils, vetch)
Soils	Red clay/loamy soil
Rainfall	435mm
Lessons learned	
• Supplementary feeding, feed budgeting and condition scoring are important strategies to maintain lambing rates. • Condition scoring ewes at joining and at key times throughout pregnancy helps identify if nutrition needs to be adjusted before it's too late to correct. • Providing extra feeding stations helps prevent lamb mortality from mismothering at crowded feeders.	

Smaller mobs deliver 'lotsa' lambs

A quest to implement best practice in their sheep enterprise led Andrew Kitto and his family to join an MLA-supported Producer Demonstration Site (PDS), where they saw the on-farm benefits of lambing twin-bearing ewes in smaller mobs.

The '*Lotsa Lambs'* PDS was run by Upper North Farming Systems, with a goal to improve reproductive success in mixed farming businesses.

Andrew and his wife Maria run a mixed enterprise with their daughter and son-in-law, Rachel and Nathan May, at Gladstone in the mid-north of South Australia.

Their sheep enterprise focuses on breeding prime lambs with high growth rates and high lambing percentages. They purchase Merino ewes to join with White Suffolk rams, and also operate a small White Suffolk stud to breed rams for on-farm use and to sell.

Ewe management

When Nathan completed a Lifetime Ewe Management (LTEM) course in 2020, he was inspired to implement many of the best practice principles presented in the program.

The family introduced pregnancy scanning the following year. They use electronic identification (eID) tags to collect pregnancy status data and to identify the 'doers' to retain when culling ewes. They also collect data on lamb weights at marking and weaning.

Rams are provided with a protein flush – usually lupins – prior to joining in January. The family aims for the rams to have a condition score of 3.75 at joining.

They preg-scan at 90 days and use this as an opportunity to condition score ewes again.

Ewes are drafted into single and multiple bearing ewes and run in specific paddocks based on their pregnancy status.

Around 20% of the family's farm is hills country for grazing and 80% is cropping, which also provides stubbles for grazing over summer.

While the hill country offers good protection for lambing with tussocky grasses, this is offset by poorer nutrition, combined with practical challenges of supplementary feeding in these paddocks. It's also difficult to run smaller mobs in the hills, so preferential paddocks are allocated to multiple-bearing ewes based on feed-on-offer, but this often comes at the cost of less shelter.

Ewes receive barley and hay through pregnancy and lambing, depending on the quality and availability of feed, as well as licks providing mineral supplementation.

Challenges

The Kittos had identified some challenges in their flock, so participating in the PDS was an opportunity to dig deeper into these issues.

In particular, they wanted to:

- investigate why pregnancy toxicity was occurring
- adjust supplementary feeding to prevent ewe condition score slipping as it was difficult to regain condition

- fine-tune grain rations to prevent birthing problems as a result of larger lambs.

“We were experiencing ewe mortality up around 8-13% in a bad year, and we were keen to decrease this,” Andrew said.

“We thought this could be achievable by monitoring condition score, aided by having a younger flock with a new line of hoggets introduced in 2021, but we also wanted to introduce other practices to reduce ewe mortality.”

Infrastructure for smaller mobs

Previously, the Kittos would run ewes with multiples in mobs of around 300 head, but for the PDS they reduced this to 120 multiple-bearing ewes per mob.

This required some investment in temporary water troughs (with water pipe running on top of the ground) and electric fencing to split paddocks up for these smaller twinning mobs.

Andrew plans to further reduce twin-bearing mob size after hearing livestock consultant Nathan Scott of Achieve Ag Solutions present as part of the Lotsa Lambs project. Their ideal would be 60 head/mob but this isn’t commercially viable for the business, so the family will target 100 head for multiples moving forward.

Maintaining conditions

A core focus of the Kittos’ demonstration site was on maintaining optimal condition scores during gestation to target a lambing rate of 130% across the flock.

SA-based consultant Deb Scammell of Talking Livestock provided guidance to achieve this through:

- supplementary feeding
- feed budgeting
- condition scoring.

Over the three-year PDS, the family lifted condition scoring at lambing from 3.2 in 2022 to 3.5 in 2023 and 2024. While the average was good, they faced a challenge of how to reduce the range in mob condition scores.

In the first year of the PDS (2022), they achieved 89% lambing for singles and 88% for multiple-bearing ewes.

This was the lowest result across the three years and was attributed to:

- a lower-than-ideal condition score
- a high proportion of older ewes
- challenging seasonal conditions with cold, wet weather during lambing.

With condition scores ranging from 2.6 to 4, Deb advised Nathan and Andrew to use the LTEM condition score graph to track this range to understand the impact it has on lambing percentage, especially on multiple-bearing ewes.

“Deb suggested we aim to keep variation in the mob within around 0.5 of a condition score, especially during late pregnancy,” Andrew said.

“If we’re getting a large range, it’s best practice to draft ewes in mid-pregnancy based on their condition score and feed the tail slightly more.

"Often ewe mortality and decreases in lamb marking percentage is due to the ewes that are below the average of the mob, so drafting these off can make a significant difference to your overall result."

Another strategy was to allocate two feeders per 100 ewes, to reduce mismothering and prevent ewes rushing the feeder.

Reducing mob size

The more favourable conditions in 2023 delivered a good early season break which provided green feed for ewes at the end of pregnancy and into lambing (compared to the dry start in 2022).

Pregnant ewes were on vetch stubble and grain supplements until 20 May, when they were split into four 10ha paddocks with vetch and barley for lambing in June.

Scanning results were inaccurate this year as lots of multiples were in the single mobs – resulting in lambing rates of 141% for singles and 155% for multiples. Some of the mortalities may have been because twin-bearing ewes were underfed in the single mobs, and vice versa for the single-bearing ewes being overfed in twin mobs.

However, the 2023 lambing results were excellent overall, which was attributed to the earlier seasonal break, feed-on-offer at lambing and smaller mob size. Undulation in the hills provided shelter, and ewe mortality dropped to just 2% during lambing.

In 2024, the Kittos split an undulating paddock into three (using electric fencing) for multiples and ran mob sizes of just under 100 ewes.

This was labour intensive, with two people setting up approximately 10km of electric fencing over three days. It also took about one hour each day to rotate mobs through the paddocks and provide supplementary feeding to the smaller mobs.

"Mild weather at lambing in 2024 gave an advantage to lamb survival compared to the 2022 season, when there was a cold snap at lambing time," Andrew said. "We also had an ideal condition score of 3.25 during pregnancy and, importantly, had less variability in the condition score range."

Managing the dry

The final year of the Kittos' demonstration site (2024) was the driest season on record for the region.

"Conditions were very challenging for both cropping and grazing," Andrew said. "We had a very late season break after lambing, with just 28mm on 26 May, followed by 50mm in early June and then ongoing very dry conditions throughout late winter/spring."

Lack of feed on offer meant splitting mobs into the 10ha electric fenced paddocks was not an option, so multiple bearing ewes – still in mobs of less than 100 head – remained in larger paddocks sown to barley and vetch (which had limited germination).

The very dry conditions required additional supplementary feeding, which increased the risk of mismothering due to the ewes walking back to the same area to feed.

Considering the season, lamb percentages were good (95% for singles and 140% for multiples). Ewe mortality was also relatively low (2.3%), aided by small lamb size.

In years like this, to ensure high marking percentages in twin mobs Deb's advice was to further reduce mob size and provide supplementary feed at a few different feed stations.

"When there isn't adequate feed on offer, the more feeding stations you can have per mob the better," Deb said. "For a mob this size, two self-feeders and two different hay feeding sites is preferable."

Outcomes

By implementing these practices, the Kittos lifted lambing percentages from their historical average of 110% to about 130%, which improved their business' profitability and efficiency. Improving lamb and ewe survival was also important outcome at an industry level for markets and consumers.

One of the biggest learnings was the importance of condition scoring.

"Ideally, doing a score around joining and during early, mid and late pregnancy gives us something to look back on, and allows us to realise if they are slipping or getting too fat before it's too late to correct," Andrew said.

The Kittos will also take on board Deb's advice to split lambing groups by pregnancy status instead of into age groups, as a strategy to reduce the range of condition scores within a mob and support tailored feeding.

The benefits of dividing up paddocks to run smaller mobs were also clear:

- lamb survival lifted by an estimated 30%
- feed utilisation improved
- more ground cover was maintained compared to grazing one large area.

"After the guidance from this project, we've now got the confidence to continue lambing multiple-bearing ewes in smaller mobs," Andrew said.

The family is conscious that higher lambing percentages could lead to overstocking, so will be vigilant in culling the bottom 30% of performers each year.

Specific challenges arose from the mixed farming enterprise, including trying to juggle the timing of grazing and cropping activities, as well as not having permanent lambing paddocks with appropriate infrastructure such as fencing, water points and shelter belts.

Lamb mortality was higher in paddocks with little or no shelter, and although planting shelter belts would be ideal, this is not practical in paddocks which are rotationally cropped and not permanently allocated to lambing.

Reducing mob size also required investment in additional feeders. Looking ahead, the Kittos will explore other feed options such as:

- **managing excess quantities of spring feed** - splitting some of the grazing areas into smaller paddocks with electric fencing and increased stocking rates. This could also provide an extra paddock to crop and cut for hay or grain, providing an extra fodder reserve for summer/autumn feeding
- **considering silage to reduce grain feeding** – although the cost of silage is double that of hay, it's also double the nutritional value of hay, so it's a good option when barley prices are high
- **grazing cereals destined for harvest for six weeks before nodes to avoid yield penalties** - cereals at this stage are a good source of feed, with 20% protein.

Future plans

Andrew and Nathan are now equipped with strategies to adopt, and benchmarking figures to work towards with lamb survival.

“We will continue preg-scanning and running mobs separately, with multiple-bearing ewes in smaller mobs,” Andrew said.

“The more precision we have in our flock management, the easier it is to make decisions with confidence. For example, when we sold lambs early in 2024 because of the dry, we found that knowing what condition ewes and lambs were in and what we were aiming for lead to improved decision making.”

Figure 1: PDS results for Kittos’ trial site

	Number of lambs	Number of ewes	% Lambing	*CS at Preg scanning*	*Ewe mortality*	Lambing % prior to preg scanning and smaller mobs
Kitto						
Singles 2022	124	139	89%			
Multiples 2022	198	225	88%	3.2	4.0%	
Overall %	322	364	88%			
Kitto						
Singles 2023	327	232	141%			110%
Multiples 2023	453	292	155%	3.5	2.0%	
Overall %	780	524	149%			
Kitto						
Singles 2024	158	166	95%			
Multiples 2024	245	175	140%	3.5	2.4%	
Overall %	403	341	118%			

7.5.2 Case Study 2 – Alison Henderson

Image	Caption
	Upper-north SA sheep producer Alison Henderson conducts preg-scanning as a ewe management strategy. Image: Rachel Trengove, UNFS
	Alison Henderson keeps an eye on pregnant ewes during the PDS. Image: Alison Henderson
	The Henderson’s operate commercial and stud Merino flocks on their Caltowie and Booborowie farms. Image: Alison Henderson

More information	Key resources
Rachel Trengove rachel@unfs.com.au **Alison Henderson** hendowiepollmerinos@gmail.com	• **MLA Producer Demonstration Sites**: mla.com.au/pds • **Lifetime Ewe Management**: wool.com.au/ltem
On-farm snapshot	
Name/s	Alison Henderson
Location	Caltowie and Booborowie, SA
Area in hectares	1,600ha owned/share-farmed
Enterprise	800 SRS Merinos – 300 stud ewes
Pastures	400ha pasture/grazing 1,200ha cropped (cereals, beans, vetch and hay)
Soils	Red clay loam
Rainfall	425mm
Lessons learned	
• Setting specific breeding objectives guides genetic selection in our flock. • Preg-scanning technology enables targeted management of pregnant ewes. • Running smaller mobs of multiple-bearing ewes during pregnancy and lambing helps lift lambing rates.	

Detail in data drives decisions

Fifth generation South Australian sheep producer Alison Henderson believes attention to detail is the key to running a profitable enterprise.

Participating in an MLA-funded 'Lotsa Lambs' Producer Demonstration Site (PDS) equipped her with detail and data to make informed decisions and maintain lambing results despite seasonal variability.

The Hendersons operate a mixed farm in the state's mid-north. Their SRS Merino enterprise includes both commercial and stud flocks, so data is an important tool to maintain breeding objectives. Their flock is founded on Baderloo bloodlines, with the Hendersons acquiring the Baderloo Stud in 2024 in addition to Hendowie Stud.

Hendowie Stud have used Australian Sheep Breeding Values (ASBVs) to make flock decisions since 2008, in conjunction with visual assessments. Selection traits include long staple and fleece weight, fat and muscle, and early growth. Specific targets are 1.3 lambs/ewe/year, 6kg wool, and lambs to grow out to 50kg within 7-8 months.

"Our breeding objective is to breed a truly dual purpose, productive, balanced Merino sheep that thrives in a wide range of environments," Alison said.

"If I'm going to push for reproduction there will be sacrifices in areas such as growth but having a clear breeding objective ensures a balance."

They introduced electronic identification (eID) technology in 2018 and use AgriWebb to manage stock and BreedElite to record data such as wether lambs being born in twin or single mobs, ewe pregnancy status, visual traits and fleece weights.

Other genetic tools used include RamSelect, DNA testing in the stud flock, and the Flock Profile test for commercial sheep.

Livestock management

The Hendersons' livestock management calendar includes shearing twice a year (mid-April and mid-October). They ceased mulesing wether lambs in 2018, and all lambs the following year.

They join for five weeks in February/March, which is timed to optimise conception rates as day length shortens, so ewes lamb go onto green feed in July/August.

The Hendersons have pregnancy scanned since 2018 and automatically cull dry ewes when they are not in a flock-building phase.

"The preg-scanning technology enables us to better manage pregnant ewes, with more nutrition provided to smaller mobs of multiple-bearing ewes during pregnancy and lambing," Alison said.

They lamb into separate twin and single paddocks so multiples can receive preferential nutrition.

Paddocks are split with electric fencing to allow for smaller twin bearing mobs of around 100 ewes, while singles are run in mobs of 150-250. Identifying and splitting singles and twins has lifted lambing by 20%, up to around 120%.

The Hendersons' nutrition strategies are based on principles adopted from the Lifetime Ewe Management (LTEM) program, such as condition scoring and feed budgeting.

"The LTEM course included training in body condition scoring, and I have used that ever since as a crucial tool to improve lamb survival and reduce ewe mortality," Alison said.

"We have also found our feed rations are hitting the mark – condition scores give instant feedback on what's working."

They match land type to enterprise where possible. Regular pasture paddocks have a medic base, and sown pastures include a rotation of vetch.

Containment feeding helps bridge the autumn feed gap. They currently feed grain out in Poly Belt troughs (at a cost of $13-14/m).

If there is an early break, ewes go into the paddock sooner to make the most of the feed on offer, topped up with supplementary feed. However, in the dry years of this PDS (2022 and 2024), they were supplementary fed from March until just before lambing in early June.

PDS results

The site Alison allocated to the PDS was a grazing block without a cropping rotation. During lambing, exposure is an issue and Alison intends to plant shelter belts in the future. However, in the meantime she makes use of a north-facing slope and electric fencing to keep ewes in the most sheltered area.

"Paddock characteristics contribute significantly to lambing percentage and we've seen lamb survival rates increase by up to 10% in paddocks with shelter and reduced exposure to weather fronts, compared to poorer lambing paddocks lacking shelter, or which are close to trainlines or busy roads," Alison said.

After scanning and separating ewes based on pregnancy status, ewes were put into containment with supplementary feeding. For this PDS, Alison aimed for 100 or less twin bearing ewes in a mob for lambing.

Ewes are usually released from containment ten days before lambing, to help preserve feed. However, in seasons with late breaks like 2022 and 2024, supplementary feeding continues in the paddock to meet the ewes' nutrition requirements.

The prolonged dry conditions of 2024 resulted in a very late seasonal break in June, which meant there was little or no feed available for lambing ewes and they had to rely on a full ration of supplementary feed to meet their energy requirements during the lambing period.

Survival focus

The Hendersons already had low ewe mortality (2% or less) which Alison attributes to the role of genetics, with their focus on fat and muscle, as well as the right nutrition.

So they identified twin survival through finetuning nutrition and lambing conditions as the big opportunity to make productivity gains.

As part of the PDS, Alison weighed any dead lambs to build up a picture of what was causing mortality – revealing birth weight of under 3kg was a contributing factor.

"Our goal was to get twin lamb birth weights up for greater survival," she said.

This was a challenge with ewe lambs in particular, where we tried to balance feeding for growth without too much weight gain (which can lead to dystocia).

Alison achieved ideal condition scores of an average 3.5 at preg-scanning for all three seasons of the demonstration.

Seasonal challenges

The three-year trial presented a range of seasonal challenges.

The late break in **2022** meant there was no green feed to lamb onto, which contributed to the lambing results. Mismothering at feeders was an issue but with no feed on offer in paddocks, feeding was the only option.

There was an earlier break in **2023** with a useful 30mm in April and follow-up rains in May which delivered nutritional green feed and pasture growth to lamb onto. This removed the need to supplementary feed during lambing and reduced mismothering. However, cold/wet snaps contributed to some mortalities from exposure.

Mob size was more than 100 head in **2024** due to low feed on offer from drought conditions. With supplementary feeding, Alison managed to maintain condition scores around 3.5 from joining.

Although seasonal conditions were very different across the three years, Alison's consistent lambing results showed how implementing a combination of best practices can help achieve production targets, despite seasonal challenges and feed gaps.

During 2024, the Hendersons also had the chance to see the impact of mob size when they purchased additional stud ewes. While these ewes were not included in the PDS, they provided a direct comparison as both were twinning mobs with one feeder and access to scrub areas for shelter.

The smaller mob (120 ewes on 4ha) produced 168 lambs, or 140%, whereas the larger mob (170 ewes on 7ha) produced 212 lambs, or 125%.

While the stand-out observation from the PDS was the benefits of smaller mobs, Alison also observed how other factors such as lack of shelter, cold/wet snaps and genetics impacted lamb survival.

The PDS reaffirmed Alison's focus on breeding and selecting for lamb survival characteristics, such as fat and eye muscle area, which correlate with resilience.

Infrastructure and labour

Reducing mob size for lambing required investment in temporary fencing to split up paddocks.

Alison purchased two 500m electric fence kits with energisers and posts for $1,000, which enabled her to divide a 20ha paddock in half to run twinning ewes in smaller mobs. It took two hours to erect/deconstruct the fence.

Looking ahead, she plans on permanently splitting some of the paddocks to enable smaller mobs at lambing. Existing water points will enable these permanent areas to be reduced into smaller areas (10-15ha) with temporary electric fencing to be rotationally grazed over the growing season.

Figure 1: PDS results for Hendersons' trial site

	Number of lambs	Number of ewes	% Lambing	*CS at Preg scanning*	*Ewe mortality*	Lambing % prior to preg scanning and smaller mobs
Henderson						
Singles 2022	68	62	110%			
Multiples 2022	150	128	117%	*3.36*	2.4%	
Overall %	218	190	115%			
Henderson						
Singles 2023	71	65	109%			100%
Multiples 2023	104	76	137%	3.25	4.9%	
Overall %	175	141	124%			
Henderson						
Singles 2024	91	88	103%			
Multiples 2024	149	116	128%	3.3	2.8%	
Overall %	240	204	118%			

7.5.3 Case Study 3 – Lachie Smart

Image	Caption
	Upper north SA sheep producer Lachie Smart.

	Upper North Farming Systems Project Officer Rachel Trengove and upper north SA sheep producer Lachie Smart.
	Upper North Farming Systems Project Officer Rachel Trengove and Talking Livestock consultant Deb Scammell assess feed on offer in Lachie's hill paddocks.

More information	**Key resources**
Rachel Trengove rachel@unfs.com.au **Lachie Smart** avonmore1@westnet.com.au	• **MLA Producer Demonstration Sites**: mla.com.au/pds • **Containment feeding resources**: mla.com.au/containment-feeding • **Lifetime Ewe Management**: wool.com.au/ltem
On-farm snapshot	
Name/s	Lachie and Diane Smart
Location	Wirrabara, SA
Area in hectares	1,600ha
Enterprise	Mixed farming, with 1,200 self-replacing Merinos, plus 400–500 ewe hoggets and 700–800 Merino ewes mated to White Suffolk rams.
Pastures	Cropping (wheat, canola, beans, lupins), lucerne vetch for hay and pasture, perennial hills pasture
Soils	Red clay loam soils
Rainfall	460mm
Lessons learned	
• It's hard to catch-up when it comes to poor condition – condition scoring ewes in the lead up to January joining gives the best chance of achieving ideal ewe condition at joining time • Understanding feed quality and condition scoring is important to improve the accuracy and precision of feeding ewes correctly. • Containment feeding not only improves lambing rates but also allows us to protect our hill grazing country.	

Targeted nutrition a smart choice

Prolonged dry conditions across South Australia prompted sheep producer Lachie Smart to implement on-farm containment feeding, a strategic management approach where animals are fed in a designated area to protect pasture, manage nutrition, and reduce erosion during adverse conditions, helping to maintain the productivity of his ewes.

As a result of running ewes in smaller mobs based on pregnancy status, he's been able to maximise reproductive efficiency and minimise mortality in his flock – and he puts good lambing results down to having the right nutrition.

Lachie was part of an MLA-funded Producer Demonstration Site (PDS) run by the Upper North Farming Systems (UNFS) group, to build producers' knowledge about how to successfully run smaller groups of ewes for higher lamb survival.

The PDS looked at on-ground solutions for producers with autumn lambing systems, who needed to maximise feed available to lambs and extend feed on offer in the face of shorter springs and extended summer conditions.

Ewe management

Lachie's 1,600ha Wirrabara mixed farming enterprise, Avonmore, is characterised by 1,000ha of nonarable hills grazing country.

He has been lambing ewes in containment for seven years to allow these hills pastures to get established and recover from spring and summer grazing, without having to compromise on stocking rates.

Lachie drew on information from Lifetime Ewe Management (LTEM) and Grazing for Profit courses, to adjust how he manages ewes to lift productivity and profitability.

"We always have a feed deficit each year in this region, so we have two choices: either feed out or reduce numbers. By containment feeding, we've been able to increase our stocking rate – but the best part is we've been able to let the hills get away."

Lachie has seen four main benefits to his land and livestock from containment feeding:

1. **Utilising feed on offer:** higher stocking rates better utilises the flush of feed from July–September.
2. **Protecting hills grazing:** containing ewes gives the perennial pastures on his fragile hills time to get away – Lachie has observed improved ground cover, increased grass species and better feed on offer, year after year.
3. **Better monitoring:** containing ewes enables better monitoring, to ensure their condition score targets are met and fertility is maintained.
4. **Improved productivity:** since Lachie began supplementary feeding lambing rates have lifted and ewe wool cuts have improved.

Pregnancy scanning

Lachie completed an UNFS workshop to set breeding objectives and track progress using the Merino Flock Profile tool developed by Sheep Genetics. He uses electronic identification (eID) tags, with a Tepari handler and TruTest weigh scale indicator, to track pregnancy status and condition score.

Pregnancy status is an essential part of Lachie's flock management.

He has an eight-week joining, beginning in mid-December. He preg-scans in April and drafts ewes three ways: dry, single and multiple-bearing.

Lachie lambs in mid-May when feed can be scarce, especially with a failed seasonal break (as seen in the upper north region during autumn 2024).

Prior to splitting up single and multiple-bearing ewes, Lachie found he would end up with low condition scores in multiple-bearing ewes which were then hard to get back into condition.

“These were most likely twin-bearing ewes who weren’t fed enough – and I suspect the lambs born and raised by those ewes were likely to be small and potentially less productive,” he said.

“This is where containment feeding has helped maintain ewe condition. If the ewe is in good nick, the lambs are generally in good nick.”

Containment infrastructure

Lachie’s containment feeding set-up uses existing small paddocks which had been used as small weaning paddocks and to manage sheep during shearing and crutching.

There are eight pens, ranging from 4–12ha, fenced to land class with post and dropper, cyclone and barbed wire fencing. Each has a water point – either a dam or a permanent trough.

After preg-scanning in early April, Lachie condition scores, the ewes as they enter the containment area.

Ewes stay in these small paddocks for lambing, and receive good quality high protein hay, such as wheaten hay cut right before flowering. Alternatively, Lachie supplements with barley and lupins when prices make that viable.

Ewes return to the main grazing paddocks when ground cover is established – which can be as late as July. At this point, ewes continue to receive a transition ration, which gives their rumen time to adjust as they move from supplementary feeding back to pasture.

Targeted nutrition

The containment feeding period for the PDS ran from mid-March to the end of June 2023.

SA-based consultant Deb Scammell of Talking Livestock conducted feed tests on Lachie’s barley, lupins and hay to measure dry matter, protein, energy and neutral detergent fibre (NDF%).

Based on this data, twin-bearing ewes were given the following preferential rations:

Table 1. 2023 Smart Feedtest results

Feed Type	DM	Protein	Energy	NDF%
Barley	91.4	11.4	13.4	19%
Lupins	93.9	31.9	14.8	25%
Canola Vetch Ryegrass Hay	92.4	7.6	6.4	71%
Sorghum Brassica Medic Hay	92.2	9.9	10.9	46%

Twin-bearing ewes:

- lower quality hay ad-lib through pregnancy

- higher quality sorghum hay at day 140 of pregnancy
- 75% barley/25% lupins rations gradually increased from 500g/head/day at day 100 of pregnancy to 1.8kg/head/day by lambing
- high quality sorghum hay ad-lib at lambing, to reduce reliance on grain.

Single-bearing ewes:

- lower quality hay ad-lib through pregnancy
- higher quality sorghum hay introduced at lambing
- barley/lupin ration gradually increased from 500g/head/day at day 100 of pregnancy to 1.2kg/head/day by lambing.

All ewes:

- a high-quality pre-lambing mineral loose lick supplement
- if it was still dry coming into lambing, all ewes received the ration through the whole lambing period.

Hay was fed on the ground using a Hustler bale feeder, and the grain ration was fed using handmade trail feeders.

Lachie used the LTEM app to track condition scores (CS), aiming for CS 3.5 for singles coming into lambing and CS 3.5–4 for twin-bearing ewes.

While he wants to improve survival in larger lambs, lambs which are too large can result in dystocia, so Lachie has set a target birthweight of 5–6kg.

Containment results

Lachie was pleased with the results of lambing in containment paddocks in 2023, which were:

- twins: 161% at lamb marking
- singles: 95% at lamb marking

"Since completing the LTEM course, our overall lambing percentage has improved through the use of containment – as has the nutrition and management of our pregnant ewes," he said.

"This PDS reiterated the importance of keeping your eye on the ball and reinforced the importance of understanding the quality of feed and condition scoring to deliver precision feeding."

Challenges and opportunities

While Lachie has seen multiple benefits to his business from containment feeding, he acknowledges there are some challenges to consider.

"We already had containment paddocks established, so the cost of a containment set-up was not significant and, if you go down the route of fencing smaller paddocks, they do come in handy for other purposes such as shearing," he said.

"There's also more labour involved in containment feeding compared to paddock feeding – it added about 2.5 hours a day to our workload, and meant we were tied to feeding and monitoring ewes throughout the containment period."

The cost of grain and hay is also significant, however in Lachie's case he was able to produce this on-farm.

Looking ahead, Lachie plans to focus on condition scoring in December/January to prepare ewes for joining. He would also like to build additional pens, so he can separate twin-bearing ewes with lower condition scores to further target management and improve twin survival.

Another focus will be the nutrition of his hills pastures, to improve the performance of lambs.

7.5.4 Case Study – David Moore

Image	Caption
	Upper north SA sheep producer David Moore.
	Upper north SA sheep producer David Moore (right) with livestock manager Jamie Clapp.
	Talking Livestock consultant Deb Scammell condition scores sheep with Jamestown sheep producer David Moore (left) and his livestock manager Jamie Clapp.
	The Moores containment fed 1,620 sheep in 2024.

More information	Key resources

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- **MLA Producer Demonstration Sites**: mla.com.au/pds
- **Containment feeding resources**: mla.com.au/containment-feeding
- **Lifetime Ewe Management**: wool.com.au/ltem

On-farm snapshot	
Name/s	David Moore
Location	Jamestown, SA
Area in hectares	1,150ha arable, 750ha nonarable
Enterprise	Mixed farming, 1,600 ewes joined
Pastures	Winter cropping program, vetch for pasture, permanent enhanced native grassland hills grazing
Soils	Red clay loam soils
Rainfall	450mm (180mm in 2024)

Lessons learned

- Source sufficient feed as early as possible, in case supplies dry up in tough years.
- Scan for multiples/singles and separate ewes so they can be managed accordingly.
- Small mob sizes are especially critical for twin-bearing ewes.
- Monitoring condition score throughout pregnancy is a valuable management tool

Focus on multiples delivers Moore lambs

When the Moore family of Jamestown, SA, expanded their mixed farming enterprise to include a neighbouring parcel of forestry, it not only increased their grazing area but also provided the perfect location for containment infrastructure.

Initially established to carry livestock through the feed gap between March and the seasonal break expected in late April, the investment proved to be an integral part of their drought management program and allowed them to better maintain ewes through 2024's unprecedented and prolonged dry.

David Moore, who farms in partnership with his parents Lynn and Lynnette, and wife Bec, participated in an MLA-funded Producer Demonstration Site (PDS), run by Upper North Farming Systems (UNFS), which focused on the benefits of containment feeding twin-bearing ewes and singles separately.

"Containment feeding has become an essential practice in our business, as we have to balance cropping and pasture," David said.

"We rely on containment between the end of stubble grazing and the seasonal break to maintain sheep condition score, conserve energy and allow ground cover time to establish in our hills before grazing."

Flock management

The Moores run a self-replacing dual-purpose Merino flock, on Kiandra bloodlines. Surplus ewes are joined to White Suffolk rams for prime lamb production.

They aim to breed fast-growing lambs, while at the same time increasing wool production, for overall increased productivity and profitability.

David conducted flock profiling in 2022 as part of another UNFS project supported by MLA.

“The flock profiling provided us with a benchmark of how our flock is currently performing, so we could identify areas for improvement,” he said.

“Our maternal flock was productive for meat and wool, but there is still space for improvement.”

David and his livestock manager, Jamie Clapp, collect data from electronic identification (eID) tags. Their focus for 2025 is to track the performance of lambs, using eID to monitor and manage their growth rates. In the future, they would like to use eID to profile the flock and identify poor performing animals to cull.

David recently introduced the AgriWebb farm management software into his business, which was been a useful tool for flock and paddock management and allocating tasks. This is especially useful in a mixed farming enterprise, helping balance the often-competing priorities of cropping and livestock.

Containment infrastructure

The Moores have been containment feeding since 2016 but their original containment area, while having a slope for effluent run-off, had no shelter and only a 600-head capacity.

The new site is nestled between established gum trees on a gentle slope –ticking the boxes for both drainage and shelter. The new set-up includes four 0.5ha containment pens with post and ringlock fencing, and a permanent water point in each pen.

Alongside the containment pens are three 3–5ha paddocks for lambing into. In 2024, David added three pens for finishing lambs as part of the complex.

Ewe management for lambing 2024

In 2024, the business fed 1,620 sheep in containment during a year which delivered only 40% of their anticipated rainfall.

Ewes were joined to the White Suffolk rams in mid-November 2023, and the self-replacing flock were joined to Merino rams in January 2024.

Each joining ran for six weeks, and the mobs were preg-scanned ~90 days after the commencement of joining. The timing is aimed at optimising the ability to scan for twins, so ewes can be separated for preferential management.

All ewes were inducted into the containment pens in late March.

Dave also purchased an additional 300 Merino ewes in January 2024, which were scanned in lamb to Suffolk rams (but not scanned for litter size).

For the PDS, there were three cohorts of ewes in containment:

1. **Purchased Merino ewes – joined to Suffolks:**
   - 300 scanned in lamb

   These ewes lambed into containment in early April.

2. **Merino ewes – joined to Suffolks:**
   - 300 twin bearing ewes
   - 285 single-bearing ewes

   The multiple-bearing ewes were lambed in larger containment pens (3–5ha) and the single-bearing ewes lambed in the paddock, in mid-April/May.

3. **Merino ewes – joined to Merinos**
   - 386 single scanned ewes
   - 350 multiple scanned ewes

   These ewes were moved out of containment in late May, into hill paddocks for lambing in June. As they lambed onto dry feed (500kg/DM/ha) they had access to barley in self-feeders.

Containment nutrition

Talking Livestock consultant Deb Scammell provided guidance on condition scoring (CS) for the PDS, which was conducted regularly throughout containment period. The target was CS 3 for single-bearing ewes and CS 3.5 for twin-bearing ewes.

Ewes received lime/salt/magnesium supplementation throughout pregnancy, which was replaced with Magforce for the final few weeks before lambing.

The main difference between multiple and single-bearing ewes was that the ewes scanned with multiple lambs had access to more grain for the last few weeks of gestation, as well as better quality hay for the duration of their containment to meet their higher energy requirements.

Results

The very dry conditions and no green feed in the lead up to, and during, lambing had a downward impact on lambing rates, with only 74% lambing for singles and 108% for multiples achieved with the Moores' ewes in 2024.

This compares with a five-year average of 98% for singles and 140% for multiples.

"Sourcing hay was difficult in a tight market with the incredibly dry season in 2024 across SA and that was compounded by a longer-than-planned supplementary feeding program," David said. "This meant condition scores in late pregnancy were lower than optimal, due to the extenuating seasonal circumstances."

Despite the lower than desired lambing rates, the PDS demonstrated the productivity benefits of preferentially managing ewes based on preg-scan results.

For example, in one of the mobs of purchased ewes (which were not separated based on litter size), the marking rate was 92%. However, in two other mobs which were segregated, the multiple-bearing ewes had 144% lamb marking.

“We realised we could increase lambing rates by identifying multiple-bearing ewes and managing them accordingly,” David said. “That included implementing small mob sizes and increased grain rations, compared to the single-bearing ewes and the purchased ewes which weren’t segregated.”

Challenges

Although running sheep in containment allowed regular monitoring to identify any health concerns, David and Jamie observed a higher rate of prolapse in ewes in 2024 than previously seen.

Deb advised this could possibly indicate a calcium deficiency. However, in the future, autopsies and further investigation would be worthwhile to determine if there were any other contributing factors.

Maintaining a balanced diet was a challenge in 2024, due to the variable quality and constrained availability of hay supplies. The Moore’s produced all their own barley for feeding, and hay is either produced on-farm or purchased.

The ongoing poor seasonal conditions resulted in no hay being produced in 2024, so David sourced hay and straw in preparation for containment feeding in 2025.

Opportunities

As they continue to embrace the opportunities from eID, David and Jamie plan on recording ewe and lamb mortality data.

“This will allow us to troubleshoot what is likely to have gone wrong and also identify the best lambing paddocks for lamb survival,” David said.

He said a well-designed containment yard has delivered many benefits to their business.

“A single, central set-up near feed stores has reduced labour, and the addition of laneways, permanent water supplies and good fencing has streamlined livestock management during containment.

“Although the unprecedented conditions did impact lambing rates for 2024, overall, we saw ewe condition coming into lambing and lambing percentages significantly improve since introducing containment feeding, with excellent results in previous years.

“Key learnings from the tough season in 2024 is to source feed early, maintain ewe condition score as early as possible (because it’s hard to catch-up when condition drops), and to lamb twin-bearing ewes separately in small mobs.”