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Lamb Yard Weaning Producer Demonstration

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1 ABSTRACT

This lamb yard weaning producer demonstration was designed to evaluate the impact yard weaning has on post weaning performance (growth rates) and its potential to improve the profitability of sheep breeding enterprises. The results achieved across the demonstration sites generally showed a statistically significant difference in growth rates in favour of paddock weaning, however there were a large number of factors which contributed to these results. The results achieved have illustrated that the weaning process is complex and achieving optimum animal performance can be difficult irrespective of weaning type.

The greatest influence on animal performance, regardless of weaning method was nutrition. While there is nothing new in this finding, it could be concluded that the sheer impact of nutrition pre and post weaning was underestimated by all contributing producers. Water quality and availability at weaning are also critical factors irrespective of weaning method. All sites perceived there to be a difference in the behaviour of lambs that were yard weaned. This suggests that there are benefits to be achieved through improved ease of handling animals in the future, especially for self replacing flocks.

Weaning is a complex task with a range of influencing factors which should not be underestimated by producers.

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2 EXECUTIVE SUMMARY

This lamb yard weaning producer demonstration was designed to evaluate the impact yard weaning has on post weaning performance (growth rates) and its potential to improve the profitability of sheep breeding enterprises. It was also designed to assess the cost benefit of yard weaning, the impact on animal behaviour, and ultimately to improve producer knowledge of weaning operations.

The results achieved across the demonstration sites generally showed a statistically significant difference in growth rates in favour of paddock weaning, however there were a large number of factors which contributed to these results. The results achieved have illustrated that the weaning process is complex and achieving optimum animal performance can be difficult irrespective of weaning type.

Yard weaning resulted in poorer overall growth rates on all but one site. Also of note, is that only one treatment on one site actually achieved a negative average weight gain for a period of time during the demonstration. This is contrary to the common perception of producers that lambs “go backwards” after weaning. Even with some significant challenges to optimum performance almost all lambs continued to gain weight throughout.

The greatest influence on animal performance, irrespective of weaning method was nutrition. While there is nothing new in this finding, it could be concluded that the sheer impact of nutrition pre and post weaning was underestimated by all contributing producers.

All sites except one utilised lucerne as a weaning pasture. While lucerne has the potential to provide high quality feed for weaning, it can also present some challenges. Understanding the changes in nutritional value, and physical attractiveness of lucerne plants is a critical component of achieving optimum animal performance. There is potential for improved preparation of lucerne for use as weaning paddocks on all properties involved in the demonstration.

Water quality and availability at weaning is also a critical factor both in yard weaning and paddock weaning situations. Trough space in both yard and paddock weaning systems should not be underestimated as it is well documented that dehydration can result in poor animal performance. It is proposed that water trough size be one of the main determining factors that producers use in allocating weaning mob size.

All sites perceived there to be a difference in the behaviour of lambs that were yard weaned. This would suggest that there are benefits to be achieved through improved ease of handling animals in the future. This factor is most significant for self replacing flocks, where influencing behaviour and reaction to stressors is of significance for animals that will remain on the property for multiple years.

While the groups involved in this producer demonstration contributed through individual participants, and information flowed back through each group, there was not specific ownership of the project from any one group involved. It is recommended that future demonstrations be undertaken with a ‘lead group’ who help to drive the project from within, even if other groups are associated with the project.

3 BACKGROUND

It is a common observation from Australian sheep producers that lamb growth rates following weaning are typically below desirable levels in both Merino and cross bred flocks. Lamb growth rates directly influence lamb turnoff dates and have been linked to increased weaner mortality rates. Both situations have direct negative impacts on a sheep enterprise, either reducing income or increasing costs associated with that enterprise.

Yard weaning is used extensively in the cattle industry with an emphasis on influencing animal behaviour. It has also been demonstrated to influence cattle growth rates upon entering an intensive feedlot situation.

There is currently very little information available to Australian sheep producers regarding the concept of yard weaning lambs.

4 OBJECTIVES

The aim of this producer demonstration was to evaluate the impact yard weaning has on post weaning performance (growth rates) and its potential to improve the profitability of sheep breeding enterprises. Specifically the objectives were to

a) To evaluate if an increase in live weight of >2.5 kg/head , 30 days post weaning could be achieved in yard weaned lambs compared to the control group.

b) Conduct a benefit:cost analysis of yard weaning compared to conventional weaning practices.

c) Increase producer knowledge in implementation of successful yard weaning programs and the potential benefits to enterprise productivity/profitability.

d) To subjectively assess the differences in animal behaviour when handling/yarding between the yard weaned and conventional weaned lambs.

5 METHODOLOGY

5.1 Site Selection

Properties chosen for the demonstrations represented both prime lambs and merino enterprises. The producer demonstration was to be conducted across 5 sites, however one of the 2013 sites withdrew from the demonstration in the early stages due to operational difficulties and timing of operations. The Bellchambers site in 2012 only had yard weaned lambs. Table 1 below lists the sites participating in this producer demonstration, together with their enterprise type and year of participation.

Table 1 – Participating Sites

Site	Location	Year	Enterprise
Warrambeen	Rokewood	2012	Commercial merino
Warrambeen	Rokewood	2013	Commercial merino
Bellchambers	Shelford	2012	Commercial merino
Lawrence	Waubra	2012	Composite prime lambs
Hanson	Irrewarra	2013	Composite prime lambs

The methodology used in the demonstrations is shown below.

5.2 During October/November/December

Imprint grain feeding to 'trial ewe mobs' (50-100 g/ewe x minimum of 6 feeds prior to weaning) was carried out by producer trial hosts prior to weaning date.

5.3 Three to four weeks prior to weaning

- One ewe mob of at least 250 ewes was chosen from each property as the source of lambs for the trial.
- Weights were recorded from 50 lambs selected from the central third of the mob as run through a race (ie. let one third of mob through, weigh 50 lambs, let remaining sheep through). These weights will provide a representative weight gain/loss in lead up to weaning.
- The pasture in the pre-weaning paddocks were analysed for metabolisable energy, protein and neutral detergent fibre. These results are shown in Table 2.

Table 2. Feed quality of pre-weaning paddocks

Site		Description	Est MJME/kg	% Crude Protein	NDF
Warrambeen	2012	Ryegrass and clover*	9.5	11	50
	2013	Spray top pasture	6.9	7.1	66
Bellchambers	2012	Not measured			
Lawrence	2013	Ryegrass and clover	10.2	11.6	46.6
Hanson	2013	Ryegrass and clover	9.5	12	54.8

* average three samples

5.4 During November/December 2012

Day of weaning:

- Lambs from 'trial mob' ewes were randomly drafted into 'yard weaned' and 'control' groups to give a minimum of 100 per treatment.
- A minimum of 50 lambs from each of the treatments were selected at random, ear tagged with electronic ear tags and weighed.
- 'Control' group lambs were managed according to typical weaning practices used on each property and transferred to paddocks selected for weaning
- 'Yard weaned' lambs were allocated to yards which were prepared for yard weaning prior to weaning date.
- Any animal health treatments given to lambs at weaning were given to both groups.

Yard Weaning:

- Immediately following weaning the yard weaned lambs were confined to the yards for four days (refer to section 5.6 for specific variations from this methodology). The characteristics of each yard used for yard weaning are shown below. Yard weaned lambs were given access to high quality water. Troughs were cleaned regularly throughout weaning period.
- During weaning the lambs had access to ad-lib high quality hay and trail-fed a cereal grain ration of approximately 50g/hd/day (refer to section 5.6 for specific variations from this methodology)
- The ration fed to yard weaned lambs was representative of supplementary feed held on each property and not a prescribed specialist ration. The supplementary feed was a maintenance ration designed to minimise or eliminate weight loss during the 4 day yard weaning period. It is not the feed provided during yard weaning which was to demonstrate a difference in lamb performance, but the social adjustment achieved within this period which will allow lambs to perform at a superior level once returned to a grazing situation. The characteristics of the feed provided in the weaning yards are shown in
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- Table 3

Table 3. Feed characteristics of yard weaning ration.

		Description	Est MJME/kg	% Crude Protein	NDF
Warrambeen	2012	Lucerne Hay	8.8	18.9	44.6
		Wheat/Barley	13.7	14.1	
	2013	Cereal hay	8.4	8.1	66.7
Bellchambers	2012	Oat/clover hay	9.3	8.1	60.7
		Barley	12.5	9.5	
Lawrence	2012	Lucerne hay	7.4	16.3	62.3
		Oats	12.5	9.5	

Hanson	2013	Silage	9.5	6.5	54.1
		Barley	13.5	8.8	19.2

The yard weaned lambs were moved onto pasture on the fifth morning, post weaning (refer to section 5.6 for specific variations from this methodology). At three sites (Warrambeen 2012 and 2013 and Hanson 2013) they were moved to separate paddocks from the conventionally weaned animals, while at the Lawrence site both treatments were run in the same paddock (the Bellchambers site had no control mob). The feed quality of the weaning pastures is shown in Table 4.

Table 4. Feed quality of weaning pastures

		Description	Est MJME/kg	% Crude Protein	NDF
Warrambeen 2012	Control		11	24.8	30.7
	Yard		6.9	7.1	66
Warrambeen 2013	Control	Lucerne	9.8	19.7	38.7
	Yard	Lucerne	10	20.5	38
Bellchambers			7.7	8.2	56.5
Lawrence		Lucerne	11	24.8	30.7
Hanson	Control	Lucerne	10.6	28.2	30.9
	Yard	Lucerne	9.4	26.7	39.8

5.5 Post weaning

'Control' and 'Yard Weaned' lambs were individually weighed approximately 14 days post lamb weaning date and again at approximately 30 days post lamb weaning date to assess lamb growth rate differences between groups (refer to section 5.6 for specific variations from this methodology). The differences between treatments were analysed using an unpaired t test to determine the statistical significance of results.

5.6 Variations from the prescribed methodology

5.6.1 "Warrambeen", Rokewood Victoria - 2012

The length of time that yard weaned lambs were held in the yard weaning system was shortened to only 4 days, as a result of an upcoming heatwave with temperatures expected to reach 35^0 celsius.

5.6.2 Matt Bellchambers, Shelford Victoria 2012

Unfortunately due to the timing of weaning, and a miscommunication this site did not retain a control mob, with all lambs yard weaned.

5.6.3 Warrambeen", Rokewood Victoria - 2013

The length of time that yard weaned lambs were to be held within the yards was reduced to 3 days, and only hay was offered to the lambs (no grain).

5.6.4 Will & Kate Hanson, Irrewarra Victoria - 2013

The period of time that yard weaned lambs were held in the yards was shortened to 4 days. Due to unforeseen circumstances, both mobs were also boxed together to graze the same pastures after the first 20 days. There was some variation in the timing of weight recording due to workload and to line up with existing operations.

6 RESULTS

6.1 Animal Performance

6.1.1 "Warrambeen", Rokewood Victoria - 2012

The Warrambeen site weaned merino lambs in December of 2012.
Table 5 below outlines the changes in weight achieved for both treatments throughout the post weaning period.

Table 5. Weight gain (kg) Warrambeen 2012

Treatment	5 Dec 12 - 21 Dec 12	21 Dec 12 - 7 Jan 13	5 Dec 12 - 7 Jan 13
Paddock	3.86	0.93	4.79
Yard	1.53	3.78	5.42
Difference	**-2.33*** **	**2.86*** **	**0.63^{NS}**

NS – not significant * P < 0.05 ** P 0.001 *** P < 0.0001

There was a significant difference in weight gain between the treatments in the first 15 days post weaning. The paddock weaned lambs achieved an average weight increase of 3.86kg or 257g per day, while the yard weaned lambs only achieved an increase of 1.53kg or 102g per day.

There was also significant difference in weight gain between the treatments from day 15 to day 33 post weaning. The paddock weaned lambs only achieved an average weight increase of 0.93kg or 52g per day, while the yard weaned lambs achieved an increase of 3.78kg or 210g per day.

Overall the differences in weight gain achieved over the 33 day period post weaning were not statistically significant

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Figure 1 - Warrambeen 2012 - Weaning paddock lucerne

6.1.2 Ian Lawrence, Waubra Victoria - 2012

The Waubra site weaned composite lambs in December of 2012.

Table 6 below outlines the changes in weight achieved for both treatments throughout the post weaning period.

Table 6 - Weight gain (kg) Lawrence 2012

Treatment	20 Dec 12 - 7 Jan 13	7 Jan 13 - 31 Jan 13	20 Dec 12 - 31 Jan 13
Paddock	0.51	2.09	2.60
Yard	-0.83	2.54	1.71
Difference	**-1.34*** **	**0.44***	**-0.9****

NS – not significant * P < 0.05 ** P 0.001 *** P < 0.0001

There was a significant difference in weight gain between the treatments in the first 18 days post weaning. The paddock weaned lambs achieved an average weight increase of 0.51kg or 28g per day, while the yard weaned lambs lost 0.83kg or 46g per day.

There was also significant difference in weight gain between the treatments from day 18 to day 42 post weaning. The paddock weaned lambs achieved an average weight increase of 2.09kg or 87g per day, while the yard weaned lambs achieved an increase of 2.54kg or 106g per day.

Overall the differences in weight gain achieved over the 42 day period post weaning were statistically significant, with the paddock weaned lambs achieving higher growth rates (2.6kg) than the yard weaned lambs (1.71kg).

Figure 2 - Lawrence Weaning lucerne. Note the lack of available leaf for lambs to consume

6.1.3 Matt Bellchambers, Shelford Victoria 2012

The Shelford site weaned merino lambs in 2012.

These lambs achieved an average weight gain of 0.59kg in the first 22 days post weaning or 27g per day. The lambs achieved a weight gain of 1.54kg or 110g per day in the period from day 22 to day 36 post weaning. The lack of a control mob makes any comparison impossible, other than to weaning in previous years, which anecdotally has seen weight loss throughout the post weaning period.

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Figure 3 - Failed cereal crop to be grazed by lambs post weaning. It was observed that little grain was being consumed, with lambs predominantly grazing hog weed in the paddock

6.1.4 "Warrambeen", Rokewood Victoria - 2013

The Warrambeen site weaned merino lambs in December of 2013.
Table 7 below outlines the changes in weight achieved for both treatments throughout the post weaning period.

Table 7 - Weight gain (kg) Warrambeen 2013

Treatment	25 Nov 13 – 16 Dec 13	16 Dec 13 - 8 Jan 14	25 Nov 13 - 8 Jan 14
Paddock	3.16	1.09	4.25
Yard	2.47	0.38	2.89
Difference	**-0.69^{NS}**	**-0.70^{NS}**	**-1.35****

NS – not significant * P < 0.05 ** P 0.001 *** P < 0.0001

There was no significant difference in weight gain between the treatments in the first 21 days post weaning. The paddock weaned lambs achieved an average weight increase of 3.16kg or 150g per day, while the yard weaned lambs achieved an increase of 2.47kg or 118g per day.

There was also no significant difference in weight gain between the treatments from day 21 to day 41 post weaning. The paddock weaned lambs only achieved an average weight increase of 1.09kg or 54g per day, while the yard weaned lambs achieved an increase of 0.38kg or 19g per day.

Overall the differences in weight gain achieved over the 33 day period post weaning were however statistically significant. The paddock weaned lambs achieved an overall weight gain of 4.25kg or 101g per day, while the yard weaned lambs only achieved 2.89kg or 69g per day.
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6.1.5 Will & Kate Hanson, Irrewarra Victoria - 2013

The Irrewarra site weaned composite lambs in November of 2012. Table 8 below outlines the changes in weight achieved for both treatments throughout the post weaning period.

Table 8 - Weight gain (kg) Hanson 2013

Treatment	19 Nov 13 – 24 Dec 13	24 Dec 13 - 31 Jan 14	19 Nov 13 - 31 Jan 14
Paddock	11.22	8.45	19.68
Yard	7.9	9.77	17.73
Difference	**-3.32*****	**1.32***	**-1.95***

NS – not significant * P < 0.05 ** P 0.001 *** P < 0.0001

There was a significant difference in weight gain between the treatments in the first 35 days post weaning. The paddock weaned lambs achieved an average weight increase of 11.22kg or 320g per day, while the yard weaned lambs only achieved an increase of 7.9kg or 225g per day.

There was also significant difference in weight gain between the treatments from day 35 to day 88 post weaning. The paddock weaned lambs achieved an average weight increase of 8.45kg or 153g per day, while the yard weaned lambs achieved an increase of 9.77kg or 184g per day.

Overall the differences in weight gain achieved over the 88 day period post weaning were statistically significant with paddock weaned lambs achieving a total weight gain of 19.68kg or 223g per day, and the yard weaned lambs achieving a total weight gain of 17.73 or 201g per day.

6.2 Animal Behaviour Observations

The following is direct feedback received from each participating producer regarding animal behaviour of yard weaned lambs as observed during the demonstration. Full responses from participants can are listed in the appendices section of this report.

6.2.1 "Warrambeen", Rokewood Victoria

"Quieter lambs to handle that don't spook easily. Lambs also flow better through handling facilities. Lambs more likely to stay in their allocated paddocks following weaning when fencing is marginal. This in turn means they are more likely to be remustered for subsequent flystrike and drenching treatments and therefore more likely to survive.".

6.2.2 Ian Lawrence, Waubra Victoria – 2012

"Saved the weaned lambs from walking off condition for days looking to find their mothers."

6.2.3 Matt Bellchambers, Shelford Victoria 2012

"Calmer. We had a low number of deaths (~2 in ~500 lambs) in comparison to prior years. Quick feed uptake by lambs, less worrying for the farmer."

6.2.4 Will & Kate Hanson, Irrewarra Victoria - 2013

"The lambs break their bond with the ewe and settle down together very well. "

7 DISCUSSION / IMPLICATIONS

7.1 Individual Demonstration Site Outcomes

7.1.1 Warrambeen 2012

The results achieved at Warrambeen indicate that there was a significant difference between the two treatments, with the paddock weaned lambs out-performing the yard weaned lambs in the first 15 days post weaning. There are a number of factors that have been identified which may have influenced this outcome.

1. It was noted that the lambs were incredibly quiet while being handled in the yards on the day of weaning. Upon questioning this, it was revealed that all lambs had been held in the yards while the ewes were shorn. This was a period of a day or two (depending on the mob) and took place a fortnight prior to weaning. It is conceivable that this process may have resulted in a partial weaning of lambs, with exposure to handling and yards resulting in changes in behaviour and reaction to the stress events associated with the weaning process.

2. The amount of grain and hay provided, or perhaps more importantly, consumed by yard weaned lambs may not have been sufficient to maintain equivalent growth rates to the paddock weaned lambs. While this was a likely outcome noted in the trial design, novel methods of feeding may also have contributed. Imprinting of animals onto feed sources was undertaken, however hay was fed in a hay rack, and grain in troughs. Both are methods of delivery that lambs had not been exposed to previously.

3. The period of time that the yard weaned lambs were held in the yards was reduced due to an impending heat wave. It was determined by the managers of Warrambeen, that the best option was to release the lambs into their paddock on day

4 of the weaning process. There is potential for a significant impact upon animal performance through this action as the lambs were released into a paddock in which they had never grazed, and therefore were presented with a novel water source.

A novel water source in temperatures above 35^0 in combination with the stress effects associated with release from the yards could very easily have resulted in dehydration and resultant poor animal performance (growth rates). The weight gain/loss data indicates that while the yard weaned lambs still gained weight throughout this initial period, their performance was significantly poorer than the paddock weaned lambs.

4. Upon reflection, the management of Warrambeen have also question the use of course scoria as a base in the yard weaning pens. The scoria was used to reduce the risk of waterlogging and pugging. In warm dry conditions as were experienced however, it does present some risk of producing foot soreness in lambs simply due to the rough surface present. It is conceivable that this could have contributed to the poor early performance of the lambs.

Once the yard weaned lambs had settled in their lucerne paddock it is evident from the weight gain data that they outperformed the paddock weaned lambs. These additional growth rates were still not sufficient to make up for the difference in weight gain experienced in the first 15 days.

There are a number of potential causes of this difference in performance.

1. The yard weaned lambs experienced some form of compensatory growth throughout this period.

2. There was a difference in feed quality between the two lucerne paddocks despite being managed in exactly the same manner

3. It was noted that the yard weaned lambs made much better use of the shade available in their paddock during the ensuing heatwaves over the post weaning period, while the paddock weaned lambs seemed content to stand in full sun. Dehydration and heat stress could potentially have contributed to the poor performance of the paddock weaned lambs.

Another observation from the weaning at Warrambeen in 2012 was the deterioration of pasture quality prior to weaning. Feed test results indicated that pastures had already reached a point where lamb growth was being limited by low protein levels and reducing energy content. It is likely that lamb growth had slowed significantly in the lead up to lambing. While better quality feed was to be offered to lambs post weaning in the form of lucerne pastures, there was likely to be a significant period of time prior to weaning where lamb performance was compromised.

Also to be considered is the considerable change in diet occurring at a time when animals are already experiencing a stress event. There will be a period of time required for an animal to adjust from a pasture providing 6.3% protein immediately onto one providing 24.8%. This adjustment period will likely result in suboptimal animal performance.

7.1.2 Lawrence 2012

The weaning of composite lambs at Waubra demonstrated a significant difference in growth rates between the two treatments in the first 18 days post weaning. In this instance the yard weaned lambs actually lost weight, while the paddock weaned lambs were able to maintain some modest growth rates throughout. There are a number of possible explanations for this difference in weight gain.

1. The amount of grain and hay provided, or perhaps more importantly, consumed by yard weaned lambs may not have been sufficient to maintain equivalent growth rates to the paddock weaned lambs. While this was a likely outcome noted in the trial design, the potential impact may have been underestimated. It was suggested by the producer that the imprint feeding may not have been as effective as desired, as some of the ewes involved had never been grain fed, leading to even slower uptake of their lambs.

2. There were issues with water supply experienced in the yard weaning system. Water quality and supply were both compromised at different stages during the yard weaning process. A blown pipe interrupted supply which may have led to some subclinical dehydration.

Once the yard weaned lambs were returned from the yards to the same paddock with the control mob, their growth rates were higher than those of the paddock weaned lambs. There is no clear explanation for this shift in weight gain, other than some form of compensatory growth, or through a more rapid recovery from the stressors of weaning.

Overall the improvement in growth rates from the yard weaned lambs was not sufficient to make up for the weight loss experienced initially. There was a statistically significant difference, with the paddock weaned lambs achieving higher growth rates over the entire period.

All growth rates achieved were considerably lower than desired in a prime lamb enterprise and were certainly impacted by the early finish to spring, limited quantities of quality pasture, and a lack of supplementary feeding.

7.1.3 Bellchambers 2012

The weight gains achieved post weaning were modest, and with no control it is difficult to draw anything conclusive from this site. It was stated that this was the most successful weaning on the property for a number of years, with no mortality, and weight gain throughout even if only modest. For this site the greatest benefits came from the information obtained from feed tests and advice given throughout regarding animal nutrition. Exposure to this information has been an important step for this property.

7.1.4 Warrambeen 2013

The results achieved at Warrambeen indicate that there was no significant difference between the two treatments in either period post weaning. When combined the overall difference was statistically significant with the paddock weaned lambs out-performing the yard weaned lambs. There are a number of factors that have been identified which may have influenced this outcome.

- Only hay was fed to yard weaned lambs. Feed tests indicated this hay to be relatively low in both energy and protein compared to what is required to achieve higher growth rates in young lambs. Once again it may have been the novel feeding method of using hay racks that lambs had never been exposed to that impacted upon intake. While accurate measurements of lamb intake were not possible, it was certainly noticeable that very little hay was consumed during the weaning period.

- A burst water pipe resulted in wet areas in the weaning pen. While unlikely to have any major influence on lamb performance, there is some chance that this incident may have had some impact.

- Feedtest results for the two lucerne paddocks being grazed by the lambs indicate that while very similar in their nutritional value, if anything the control mob were grazing the lucerne with marginally higher energy and protein content.

Another observation from the Warrambeen site in 2013 was the change of weaning date to the 25th of November from the 5th of December in the previous year. This also coincided with a much more favourable spring, which in combination resulted in considerably better pasture quality up until the point of weaning. The lambs were weaned at almost identical liveweights in both years, despite the 2013 weaning taking place almost a fortnight earlier.

Average growth rates achieved in 2013 across the post weaning period were lower overall than those achieved in 2012 despite a much better spring. One of the observations of the lucerne being grazed by both treatments was its maturity. The lucerne had a percentage of flowers present, and stems had started to become woody. While the protein content of lucerne in both paddocks was around 20%, energy content had dropped to 10ME and 9.8ME..

7.1.5 Hanson

The results achieved at the Irrewarra site indicate that there was a significant difference between the two treatments, with the paddock weaned lambs out-performing the yard weaned lambs in the first 15 days post weaning. There are a number of factors that have been identified which are likely to have influenced this outcome.

1. The amount of grain and hay provided, or perhaps more importantly, consumed by yard weaned lambs may not have been sufficient to maintain equivalent growth rates to the paddock weaned lambs. While this was a likely outcome noted in the trial design, novel methods of feeding may also have contributed. Imprinting of animals onto feed sources was undertaken, however hay was fed in a hay rack, and grain in troughing. Both are methods of delivery that lambs have not been exposed to previously. While a possible contributing factor, intake of supplementary feed at this site was higher that experienced at other sites.

2. The period of time that the yard weaned lambs were held in the yards was reduced to match the yard weaning protocol already implemented on this property. It was noted however that lambs were considerably quieter in their behaviour at the point of being released into their post weaning paddock

3. When collecting samples for feed testing in the lucerne paddocks that each treatment was grazing, there was visibly a major difference in feed quality. Both lucerne paddocks were within close proximity (boundaries touching at the corner) with very similar soil types, and had been treated in exactly the same manner leading up to weaning. All spraying and grazing activities had been close to identical.

   What was discovered upon collecting the feed samples however, was that the lucerne in which the yard weaned lambs had been grazing had matured considerably more than that of the paddock weaned lambs. The stems had become woody, and lambs were only consuming leaves, and now stem. Simply the time taken to collect a feedtest sample of what the lambs were actually eating (leaves only) provided a great indication of the limitation to lamb growth rates. It was not physically possible for a lamb to achieve a full mouthful of lucerne in one bite, relying however on their ability to selectively graze leaves from the plant.

   Conversely upon entering the paddock in which the paddock weaned lambs were grazing, it was immediately evident that lambs could ‘bulk graze’ consuming large mouthfuls of high quality feed. The sampling method used for these feed tests was to only sample what the lambs were physically consuming rather than bulk cuts. Even with only the leaf being removed in the paddock being grazed by the yard weaned mob, its nutritional value (both energy and protein) was lower than that of the bulk sampling taken in the paddock weaned pasture where lambs were consuming stem and leaf.

   This will undoubtedly have influenced the difference in growth rates achieved by each treatment during this period. As a result the two mobs were subsequently boxed together and grazed only the higher quality lucerne.

From the point at which all lambs were boxed into a single mob, the yard weaned lambs achieved higher growth rates than the paddock weaned treatment. There is no clear explanation for this shift in weight gain, other than some form of compensatory growth, or through a more rapid recovery from the stressors of weaning. Interestingly by this point, all lambs’ growth rates had dropped considerably in comparison with their growth rates immediately post weaning.

7.2 Overall Producer Demonstration Findings

While the results achieved across the demonstration sites generally showed a statistically significant difference in growth rates in favour of paddock weaning, there were a large number of factors which contributed to these results. The results achieved have illustrated that the weaning process is complex and achieving optimum animal performance can be difficult irrespective of weaning type.

The greatest influence on animal performance, irrespective of weaning method is nutrition. While there is nothing new in this finding, it could be concluded that the sheer impact of nutrition pre and post weaning was underestimated by all contributing producers.

All sites except for the Bellchambers' site utilised lucerne as a weaning pasture. While lucerne has the potential to provide high quality feed for weaning, it can also present some challenges. In all cases lambs were introduced onto lucerne from a completely different pasture type at the point of weaning. The impacts of significant changes in diet are likely to be considerable regardless of weaning method. No supplementation of any sort was implemented for lambs grazing lucerne on any of the sites used in this demonstration. Elements such as sodium are important elements in achieving optimum growth rates. Given that lucerne is a natrophobe and therefore carries no sodium in the leaves, supplementation using coarse salt may have influenced lamb growth rates.

Understanding the changes in nutritional value, and physical attractiveness of lucerne plants is also a critical component of achieving optimum animal performance. There is potential for improved preparation of lucerne for use as weaning paddocks on all properties involved in the demonstration.

Water quality and availability at weaning is also a critical factor both in yard weaning and paddock weaning situations. Given that yard weaning is often taking place in a temporary facility, the water troughs used are likely to be something portable, and potential of insufficient size to allow easy access for all lambs. Trough space in both yard and paddock weaning systems should not be underestimated as dehydration can result in poor animal performance. There is often discussion regarding weaning mob size for both yard and paddock weaning. It is proposed that water trough size be one of the main determining factors that producers use in allocating lambs to weaning mobs.

All sites perceived there to be a difference in the behaviour of lambs that were yard weaned. This would suggest that there are benefits to be achieved through improved ease of handling animals in the future. This factor is most significant for self replacing flocks, were influencing behaviour and reaction to stressors is of significance for animals that will remain on the property for multiple years.

7.3 Cost Benefit Analysis

There was no tangible benefit achieved through yard weaning which can have a dollar value attributed to it. There was however additional cost in undertaking a yard weaning program. These costs have been summarised in Table 9 below.

Table 9 - Additional Direct Costs of Yard Weaning

Supplementary Feed	kg/hd/day	Days fed	Total Amount (kg)	Price/kg ($)	Total Cost
Grain Cost	0.05	5	0.25	$0.23	$0.06
Hay Cost	1	5	5	$0.15	$0.75
Total					$0.81
Additional Labour	**Hours/Day**	**Total Hours**	**Hourly Rate ($)**	**Total Cost ($)**	**Total Cost**
Checking lambs/200 lambs	1	5	35	$175.00	$0.88
Total overall cost per head					**$1.68**

The costs used have been estimated as a result of information provided by each site regarding additional time and supplementary feed. These costs will vary from property to property. It should also be noted that this only takes into account direct costs, and does not account for any capital expenditure in setting up yard weaning infrastructure. It was concluded by all sites that any additional infrastructure implemented was necessary for other tasks, and that yard weaning was simply the catalyst. Similarly the cost of imprint feeding has not been included as this was regarded as best practice, and something that should be undertaken irrespective of weaning method. Based on this, it was concluded that it would not be fair to associate any of these costs directly with yard weaning.

7.4 Review of PDS Objectives

The following were the objectives as prescribed prior to undertaking this producer demonstration, together with an assessment of the success or failure for each.

1. **To increase live weight gains by 2.5+ kg/head, 30 days post weaning in yard weaned lambs compared to the control group.**

This was not achieved on any site. In fact yard weaned lambs achieved lower growth rates over the entire trial period on each site.

2. **Conduct a benefit:cost analysis of yard weaning compared to conventional weaning practices.**

As discussed in the previous section of this report, the additional cost of completing yard weaning was calculated. The only demonstrable and yet relatively intangible benefit from yard weaning discovered in this producer demonstration was the change in animal behaviour as described by each producer. Therefore the additional costs have been outlined, however no dollar comparison with benefits could be stated.

3. **Increase producer knowledge in implementation of successful yard weaning programs and the potential benefits to enterprise productivity/profitability.**

While this producer demonstration has not demonstrated yard weaning to provide a clear benefit in productivity and profitability, it has illustrated to producers the complexities of achieving a successful weaning and maintaining optimum animal performance throughout.

4. **To subjectively assess the differences in animal behaviour when handling/yarding between the yard weaned and conventional weaned lambs.**

All sites reported an improvement in animal behaviour in the yard weaned lambs. While only a subjective assessment, it has proven enough to convince each producer involved that they will use yard weaning in the future

7.5 Technology Used in the Trial

The trial utilised electronic identification tags to allow for tracking of individual animal growth rates. These tags were read using either a handheld or fixed panel reader, with individual liveweights recorded directly against each animal. The use of this technology reduced the risk of transcription errors, and also reduced the time taken to record the necessary data. A level of expertise was required to ensure that the technology could be used effectively on properties where producers had not been exposed to this technology before.

The EID technology was used in conjunction with manual weigh crates on both the Bellchambers and Lawrence properties, and with fully automated sheep handlers on Warrambeen and the Hanson property.

Figure 4 - Manual weigh crate used for recording individual liveweights using EID

The other technology utilised was near infrared feed testing through the FeedTest laboratory at Werribee. This allowed for feed tests to be taken, with results returned in less than a week from the sample date. Producers involved were once again exposed to the great benefit of knowing the nutritional value of both supplementary feed, and pastures.

7.6 Extension of Results & Group Involvement

A field day outlining the results of year one was held on the 7th of October 2013. Unfortunately the timing of this field day coincided with the only day appropriate for spraying crops and pastures in a month. As a result, attendance was limited to only 6 producers. Feedback has been provided to the groups linked to this PDS throughout, and an additional field day is scheduled for September 2014. This timing has been selected in order to coincide with when producers should be beginning to plan for weaning.

This PDS was linked to three separate Bestwool Bestlamb groups. While this will lead to greater exposure of the final results, other than the producers directly involved, it proved difficult to get genuine contributions from the groups involved as no one group really took ownership of the PDS. It would be recommended that for future producer demonstrations, one group take ownership of the PDS, with the option of including contributions from other groups.

Having said that, the information generated by this PDS is entirely relevant to everyone within each of the three groups. Direct involvement of producers from all three groups has ensured that there has been a consistent flow of information back to the membership base of each group.

As mentioned, the upcoming September field day will provide the greatest opportunity to disseminate information to all group members, as well as other producers from the district.

8 CONCLUSION

Throughout this producer demonstration yard weaning resulted in poorer overall growth rates on all but one site. There are a number of factors which may have contributed to this result, that are not necessarily directly attributable to weaning method. Only one treatment on one site actually achieved a negative average weight gain for a period of time during the demonstration. This is contrary to the common perception of producers that lambs “go backwards” after weaning. Even with some significant challenges to optimum performance, while the weight gains achieved were not as high as desired on most sites, almost all lambs continued to gain weight throughout.

Nutrition posed the greatest challenge to maintaining high growth rates, and may be more influential than specific weaning method. The impact of nutrition was underestimated in almost every case and or treatment, irrespective of the weaning method. Water quality and availability are also critical to any weaning program. This should be used as a determining factor when planning weaning mob sizes. Weaning is a complex process with potential for a number of factors to result in sub-optimal animal performance.

While the groups involved in this producer demonstration contributed through individual participants, and information flowed back through each group, there was not specific ownership of the project from anyone group involved. It is recommended that future demonstrations be undertaken with a ‘lead group’ who help to drive the project from within, even if other groups are associated with the project.

9 APPENDICES

9.1 PRODUCER DEMONSTRATION PARTICIPATING SITES

The following is a description of each of the sites involved:

9.1.1 "Warrambeen" at Rokewood, Victoria, 2012 – Stud & commercial merino breeders

Weaning at Warrambeen is considered to be a critical period in their production calendar. Improvement in weaner survival is a focus of management, and yard weaning has been implemented in various forms over the past couple of years. As a result have purpose built facilities available for use. These included pens of approximately 20 metres by 20 metres in size, with water troughs installed, hay racks to hold hay up off the ground, and some troughing to feed grain into. Coarse scoria had been laid to provide a solid base in the pens. All lambs were to graze lucerne pastures post weaning, with the control and treatment mobs kept separately in adjacent paddocks.

Figure 5 - Warrambeen Weaning Pen 2012 - Not the scoria used on the ground to waterlogging

9.1.2 Mathew Bellchambers at Shelford, Victoria, 2012 – Commercial merino breeders

Weaning on Mathew Bellchambers' property has traditionally involved a relatively ad-hoc approach. Weaner survival has been identified as an issue over the weaning period. For the purposes of this demonstration the existing sheep yards were used for yard weaning. Smaller pens were used initially, with lambs moved into a larger holding area at the rear of the yards for the bulk of the weaning period. This pen was approximately 20 metres by 60 metres in size with a water trough installed. Hay and grain were fed on the ground. All lambs were to graze a failed cereal crop post weaning.

Figure 6 - Bellchambers weaning yard

9.1.3 Ian Lawrence at Waubra, Victoria, 2012 – Self replacing composite prime lamb breeders

Weaning on Ian Lawrence's property has traditionally involved a relatively ad-hoc approach. Lamb growth rates have been identified as an issue over the post weaning period. For the purposes of this demonstration the existing sheep yards were used for yard weaning. A larger holding area at the rear of the yards was used for the weaning period. This pen was approximately 20 metres by 60 metres in size with a water trough installed. Hay and grain were fed on the ground. All lambs were to graze lucerne pastures post weaning, with the control and treatment mobs boxed together due to a lack of suitable paddocks.

9.1.4 "Warrambeen" at Rokewood, Victoria, 2013 – Stud & commercial merino breeders

Weaning at Warrambeen remains a critical period in their production calendar. Yards in a different area of the property were used in the 2013 demonstration. Pens used were approximately 30 metres by 15 metres in size, with water troughs installed and hay racks to hold hay up off the ground. All lambs were to graze lucerne pastures post weaning, with the control and treatment mobs kept separately in adjacent paddocks.

Figure 7 - Warrambeen Weaning Pen 2013. Note the wet area resulting from the burst pipe.

9.1.5 Will & Kate Hanson at Irrewarra, Victoria, 2013 – Self replacing composite prime lamb breeders

Weaning at Will & Kate Hanson's property has been identified as a critical component of their lamb production system. They have been yard weaning for a number of years, using existing sheep yards equipped with water troughs, hay racks, and troughing attached to yard fences to keep grain well clear of the ground. Pens used were approximately 20 metres by 20 metres in size. All lambs were to graze lucerne pastures post weaning, with the control and treatment mobs kept separately in adjacent paddocks.

Figure 8 - Hanson Yard Weaning Pens. Note the trough attached to the fence for feeding grain.

9.1.6 "Mt Hesse" at Winchelsea, Victoria, 2013 – Commercial merino & first cross lamb breeders

Mt Hesse have long identified weaning as playing a critical role in their merino production system. Over a number of years they have been altering their weaning practices to incorporate components of yard weaning. This has included development of appropriate small paddocks with high quality feed. Unfortunately due to a range of factors including the timing of weaning coinciding with the Christmas period, and crutching of ewes, management of Mt Hesse withdrew their commitment to participate in the demonstration. Due to the timing of this decision, despite significant effort, a replacement site could not be found.

9.2 Producer Feedback and Lessons Learnt – Includes subjective assessment of animal behaviour

1. **Prior to taking part in this trial had you ever yard weaned lambs in the past?**
   Warrambeen - Yes, some of the lamb crop of 2011.
   Bellchambers - Yes, but not in such a structured manner.
   Lawrence - Yes we yard weaned lambs at least 30 years ago. It was a bit of a disaster as they weren't imprinted and a lot of them were being "stuck" in the cyclone fence.
   Hanson – Yes in the year previous to the trial

2. **Have you ever yard weaned cattle?**
   Warrambeen – No
   Bellchambers - No
   Lawrence - Yes at least 30 years since we yard weaned cattle. Very successful, good yards and it saved the calves finding their mothers.
   Hanson - Yes

3. **From your experience what would you describe as the major challenges of implementing yard weaning of lambs?**
   Warrambeen - Getting set up to handle large numbers. Holding lambs in yards in hot weather. Providing enough head space in each pen for water and hay. More dominant lambs sit on water and hay sources.

   Bellchambers - Time of year it takes place, Christmas/NYE and harvest. Also having appropriate paddocks for the lambs post yard weaning was an issue, but this would vary season by season.

   Lawrence - Mindset is the biggest obstacle to any new aspect of management.

   Hanson - They need to go onto good quality feed from the yards and if possible in the smallest mob size possible

4. **From your experience what would you describe as the major benefits of yard weaning (if any)?**
   Warrambeen - Quieter lambs to handle that don't spook easily. Lambs also flow better through handling facilities. Lambs more likely to stay in their allocated paddocks following weaning when fencing is marginal. This in turn means they are more likely to be remustered for subsequent flystrike and drenching treatments and therefore more likely to survive. Apart from the trial mobs which were a surprise for reasons I have suggested below, the rest of our lambs have had better LWG following weaning than in previous years.

   Bellchambers - We had a low number of deaths (~2 in ~500 lambs) in comparison to prior years. Quick feed uptake by lambs, less worrying for the farmer.

   Lawrence - Save the weaned lambs from walking off condition for days looking to find their mothers.

   Hanson - The lambs break their bond with the ewe and settle down together very well. This means that lambs can be weaned earlier than otherwise normal, which allows the ewes to return to the paddock to regain condition on good feed earlier in the season.

5. **From your experience what would you describe as the major downfalls of yard weaning?**

   Warrambeen - Refer to Q3. Have lost lambs following being held in yards in hot weather in previous years.

   Bellchambers - Bit of time to set-up weaning yard etc., but not that time consuming as the yard/small paddock is generally near the sheds/infrastructure.

   Lawrence - One must have appetizing hay to encourage lambs to eat. Oats are probably the safest grain to feed. Other grains could cause problems if stock sulk and then hit the feed too hard. Need to have plenty of feeding troughs available to overcome shy feeders.

   Hanson - More labour is required to get it right, ie, imprint feeding, daily feeds in the yards, need good quality hay.

6. **What specifically did you learn from yard weaning as part of this trial? Any significant discoveries throughout the process?**

   Warrambeen - 2012 trial lambs were held in yards while their mothers were shorn a month prior to weaning which I think was a reason that the results were not as expected in the first 2 weeks following weaning. In effect I think the beneficial impact was done before weaning. In weeks 3 and 4 following weaning of the trial lambs they were moved to different paddocks. The non yard weaned mob that had in fact done a better live weight gain in the first 2 weeks lost this advantage as they did not find the tree shelter in their paddock and spent the hottest part of the days camped on the water trough in the open sun. Their tree shelter was probably not as easy for the lambs in this mob to find. I feel a good indicator to letting lambs go from the yard is when you arrive at the yards and they remain quiet. This can occur within 24 hrs. In 2013 the focus was to implement the yard weaning process at 12 weeks of age rather that 15 or 16 weeks.

   Bellchambers - Process needs to be managed on a day by day basis. There is not a set period of time to get them out of yard. Plenty of hay needs to be on offer, I would say one bale of good quality hay unrolled each day. Troughs to be cleaned each day and additional trough placed in paddock is worthwhile also.

   Lawrence - I found six or so imprints not enough especially since I haven't hand fed the ewes much in the past. I would probably feed at least 10 or 12 times in the future. I don't think the yard fed lambs took to the hay and grain quickly enough. For a November/December weaning they have had mainly spring green feed so imprinting even more important. Some of the ewes had never been fed grain. It soon showed up that their lambs took the biggest knock at weaning even though they were running with the rest of the mob whilst imprinting.

   Hanson - We need to ensure good quality feed for the lambs to go on to from the yards. Need to feed test to ensure we know what is available for the lambs. Lambs will do better in smaller mobs in the first few weeks after weaning.

7. **Do you believe there are any benefits to the industry as a whole from yard weaning lambs?**

   Warrambeen - Yes, but I think having enough access to water, feed and shelter, and drafting lambs into similar weight ranges has a larger impact on post weaning growth rate.

Bellchambers - Yes. Low maintenance program which provides piece of mind to weaning process.

Lawrence - The biggest gain from the exercise was the fact that I finally got around to using electronic tags I've had for a while. I reweighed the lambs 3 or 4 times which was easy but I would not have re-weighed to the same extent if I had to read tags manually. By monitoring with the ID tags we did pick up some interesting trends but nothing conclusive except for the abovementioned on imprinting. I would yard wean again to try and improve on results.
Any benefit to the industry is up to the individual to trial like I have and to obtain a better understanding of their stock and feeding requirements. Hopefully by understanding and the improving genetics benefits this could be achievable. Having electronic ID tags makes the exercise worthwhile.

Hanson - Being able to wean lambs earlier allows better management of the ewe and stocking rate benefits and therefore more production/profit per hectare.

8. Will you yard wean lambs in the future?

Warrambeen - Yes, but will improve and tailor to the conditions.

Bellchambers - Yes. We will vary the technique in future, possibly complete the weaning earlier than we did this year (as average weight was over recommended), which would in turn assist ewes in getting condition back earlier.

Lawrence - Yes

Hanson - Yes

9. Any other comments or advice for other producers?

Bellchambers - Ensure lambs have been introduced to grain/pellet (and maybe hay) prior to weaning from mother.

In late afternoon, wean lambs, lock lambs in sheep yards and move ewes as far away as possible. Move lambs to weaning yards early next morning (if you don't want to lock lambs up overnight this could be done in early morning, then taken to paddock in afternoon).
Run a few old wethers or dry ewes with the lambs in the yard, assists lambs with finding feed and water.

Try to have a fresh green paddock for the lambs to go onto. Feed lambs grain/pellets for the first few days in new paddock, slowly tapering off.

Hanson - Good infrastructure is a must. Good secure water is a must. Pen numbers below 100 head seems to work best. Twice daily feeds in troughs has worked best for us.