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Lamb and Weaner Survival Program

Primary Market Research Protocol

Russell Barnett, Australian Venture Consultants (2009)

Research Objective

While actual rates of lamb and weaner survival are variable from enterprise to enterprise, current average industry rates of lamb and weaner survival across the broader Australian sheep industry are generally acknowledged as being undesirable. The economic consequences of lamb and weaner mortalities are variable depending on the specific enterprise model. However, animal losses present a significant potential threat to the entire industry if they translate into an animal welfare argument that supports the boycotting of Australian sheep products in important global markets. As such, at least from a strategic industry perspective, the extent and causation of losses as well as the parameters of practical and economic management practices that support lamb and weaner survival need to be better understood by livestock research and development agencies.

There is considerable existing scientific knowledge relating to the various causes of lamb and weaner mortality and much of this has been developed into management practices that can be implemented on-farm to improve survival rates. However, widespread adoption of many of these practices, particularly those practices that require increased inputs such as supplementary feed, animal health services or on-farm labour, remain elusive as evidenced by the consistent average marking rates experienced in many regions of Australia.

Recognising that producers across Australia will have different perspectives on lamb and weaner survival and face different lamb and weaner survival management contexts, the purpose of this project is to develop a deeper understanding of different producer's needs with respect to lamb and weaner survival management practices and products so that compelling and targeted products and practice sets that take into account specific whole-of-farm impact can be developed for and delivered to different segments of the Australian sheep industry.

Producer Segments

The Australian sheep industry is comprised of a diverse set of producers who can be differentiated according to a wide range of attributes. The four main factors that are relevant to attitudes toward lamb and weaner survival and the context in which lamb and weaner survival is or would be managed are as follows:

- Agronomic and climatic conditions

- Enterprise type
- Production goals
- Animal management philosophy

Agronomic and climatic conditions and enterprise type will be used to identify an appropriate sample of interviewees and interviewees will be categorized according to production goals and animal management philosophy post interview. The four main factors are discussed as follows:

1. Agronomic and Climatic Conditions

Agronomic and climatic conditions are critical determinants of 'natural' lamb and weaner survival rates, resources that are available to manage the problem and the economics of managing the problem. Such conditions are also highly variable across Australia and within defined regions. While there is regional variation, geography remains the most accurate proxy for agronomic and climatic conditions. The most practical criteria by which producer location can be defined is by ABARE AAGIS region (see Appendix 2). This has the added advantage of allowing the findings to be accurately compared to other data sets and analysis. Rainfall can be determined by averaging data produced by weather stations within each AAGIS region or by using data from the weather station that is likely to be the most approximate to the actual on-farm conditions of a specific interviewee.

AAGIS regional marking rate performance has been previously analysed by MLA¹ and the marking performance of various enterprise types in each region is demonstrated in Appendix 1. This will be used to assist with the prioritization of regions in the study.

It is noted, however, that agronomic and climatic conditions are also highly variable within most AAGIS regions. As such, interviewees will be recruited such that an adequate cross section of agronomic and climatic conditions within a specific AAGIS region is obtained. It is further noted that the investigation may conclude that a segment definition other than ABARE region is more suitable for defining the target of a specific set of management practices.

2. Enterprise Type

Enterprise type can also be defined by a wide range of variables including property size, specific agricultural enterprise mix, size of flock and stocking rate (intensive versus extensive). The main sampling criteria are enterprise mix which will use the ABARE definitions of prime lamb producers, sheep specialist (merino) and mixed sheep to define enterprise type. The definitions of specific ABARE enterprise types is contained in Appendix 2. Classification of interviewees according to property size, flock size and stocking rate will also be made according to agreed range categories for each variable.

3. Production Goals

¹ Australian Venture Consultants Pty Ltd (2006), *Best Practice Sheep Reproduction Management: A Review of Extension and Adoption*, Meat and Livestock Australia

Production goals measured in terms of return on assets and sustainability issues are also highly variable across the Australian sheep industry. Ranges of profitability based on ABARE quartiles of performance will also be used to categorise interviewees post interview. Interviewees will also be classified post interview according to their propensity to adopt practice change in other areas such as genetics, pasture management and natural resource management and the drivers of that adoption behaviour.

3. Animal Management Philosophy

The way in which sheep flocks are managed generally is also variable across Australia. Suitable classifications might include mob-management-extensive; mob-management-intensive; low-tech-individual animal management; and high-tech-individual-animal management. Interviewees will be classified post-interview according to specific definitions of animal management philosophy.

Sample

It is proposed that the sampling and subsequent analysis be undertaken at an AAGIS regional level, rather than across the continent. This will have two advantages:

1. It will allow the project to be divided into manageable segments that can be targeted to address regions that have been identified as being particularly problematic as a priority, allowing roll-out of solutions to occur in those regions while the Australia-wide analysis progresses. The marking rate performance data in Appendix 1 will assist in this prioritisation; and
2. It will give a degree of 'local-ownership' to the project allowing for better focused communication of the outcomes and hopefully, some local support in execution (i.e. recruiting interviewees).

It is anticipated that the average sample size in each region will be between 15 and 30 interviewees. However, this will be determined on a case-by-case basis depending on the variability within a region.

Data Collection Instrument

Snowball Sampling

It is critical that sampling is not skewed toward more 'progressive' farmers or 'serial collaborators'. As such, a small number of individuals will be identified from known diverse networks (DPI extension programs, farmer groups, farm input suppliers, livestock consultants etc), interviewed as part of the process and asked to identify other colleagues who might be interested in participating as an interviewee. This will be undertaken until an adequately diverse sample is achieved.

Personal and Phone Interview

In each region an approximately equal number of interviews will be undertaken in person and by telephone.

Ethnographic Interview

Ethnography is a social research technique that is based on studying people's behaviour in everyday contexts, rather than under controlled or artificial conditions. It focuses on informal conversations and observing the subjects in the environment in which they would be using the proposed product or management system. The objective of the ethnographic investigation is to understand the target adopter adequately to be able to step into their shoes during the product or management system design and development process so that a holistic context can be used in developing a product that meets the target adopter's needs.

The process itself has the following characteristics:

- Takes place in the natural setting in which the target adopter would use the product
- Examines the entire context in which the target adopter is using the product and how use of that product will impact on all elements of that context
- Involves both observational research techniques as well as traditional forms of open enquiry
- Is open to change and refinement as the process progresses to ensure that a holistic and rich picture of the customer and his or her needs with respect to the product is acquired

Once typical cases that are representative of a particular homogenous group have been identified, detailed ethnographic case studies will be compiled. These will demonstrate in detail:

- The specific nature of a particular lamb and/or weaner survival problem including the agronomic and climatic conditions, enterprise type and production management environment (goals and philosophy) in which the problem is occurring; and
- Specific details of economic and practical management solutions and evidence of how those solutions are economically and practically implemented on a whole-of-farm basis given the agronomic conditions, enterprise type and production management environment (goals and philosophy).

Questions

Phone and personal interviews will be conducted using an open-ended conversational instrument that has three key sections of enquiry. These are described in the following subsections.

Existing knowledge of a potential lamb and weaner survival problem

- What do you believe to be the current rate of survival of lambs and weaners on your property? How much do you believe this varies from year to year?
- What do you base this estimate on?
- What do you believe to be the major causes of lamb and weaner mortality on your property from year to year? Why do you believe this to be the major cause?
- Is lamb and weaner survival an issue you are concerned about? If not why? If so, do you currently plan to address it? If so, how?
- Do you believe that current solutions to managing lamb and weaner survival are simple or complex? Why?
- In terms of all of the issues that concern you in operating your enterprise where does lamb and weaner survival currently sit in order of priority and why? Over the longer term where has it sat in order of priority?

Applicability of Current Practices

The interviewer will systematically work through each stage of the reproduction cycle – pre-conception, joining, pre-lambing, lambing, marking and weaning - with the interviewee, asking the interviewee:

1. What activities, if any, they undertake with the intent of improving lamb and weaner survival?
2. For the activities identified by the interviewee, the interviewee will be asked to explain why they undertake the activity, how they undertake those activities and whether they believe they are simple or complex, easy or difficult?

Once the interviewee has explained the activities that they undertake, the interviewee will list the possible practices that could be undertaken to optimize lamb and weaner survival at each stage and ask the interviewee to explain why they do not currently undertake the activity and under what circumstance they would consider undertaking the activity. The possible management interventions at each stage of the reproduction cycle are listed in the table below.

Stage in Reproduction Cycle	Possible activities
Pre-conception	Artificial Insemination Embryo transfer Monitoring ewe condition (visual, condition score, weighing) Nutritional management of ewes for conception High fecundity breeds EBVs for maternal genetics Inoculation of ewes
Joining	Joining percentage Age of mating maiden ewes Testing of rams for faults Teasers Lambing time
Pre-lambing	Monitoring ewe condition (visual, condition score, weighing) Culling of dry ewes Nutritional management of ewes through gestation (specifics of feeding regimes) Visual classing of dry ewes Scanned classing of dry ewes Scanning and managing for twins and singles Differential management of maiden ewes Differential management of merino and first cross ewes
Lambing	Monitoring ewe condition (visual, condition score, weighing) Specific nutrition regimes for management of ewe condition Monitoring and management of lambing process Predator control (foxes, dogs, pigs, eagles) Ewe udder assessment Separation of twins and singles Sheltered lambing paddocks
Marking	Drenching of lambs Vaccination of lambs (what for?) Testing for trace elements (especially

	selenium) Culling of sick lambs Mulesing Testing for worm status and resistance Collection and analysis of lamb and weaner survival data (marking and weaning percentage)
Weaning	Time from birth that lambs are weaned Nutritional management of weaners

Appendix 1 – Regional Enterprise Marking Rate Performance

1990 to 2000 Average and Maximum Lambing Rate by Regional Enterprise Type

Prime Lamb Specialists (1990-2000)			
<i>Region</i>	<i>Av LR</i>	<i>Region</i>	<i>LR max</i>
South East	90.8	Mid North, Murraylands and York Peninsula	105.9
Mallee	88.4	Riverina	103.9
New South Wales Tablelands	88.3	Wimmera	94.6
Central Northern	87.2	Coastal New South Wales	94.5
Northern Tasmania, Midland & Huon	85.1	Western New South Wales	94.3
Mid North, Murraylands and York Peninsula	84.5	Eyre Peninsula	93.2
Riverina	84.3	Central Northern	91.1
North West Slopes & Plains	83.3	North West Slopes & Plains	91.0
Gippland & Western Districts	83.3	South West	91.0
Central West	82.7	Central West	90.6
Eyre Peninsula	80.3	Mallee	89.6
Northern & Eastern Wheatbelt	80.1	Northern Tasmania, Midland & Huon	88.3
Wimmera	79.9	Central & Southern Wheatbelt	87.5
Central & Southern Wheatbelt	77.4	Northern Pastoral	87.1
South West	75.5	Kalgoorlie-Central Pastoral & Pilbara	83.1
Western New South Wales	0.0	Northern & Eastern Wheatbelt	82.6
Coastal New South Wales	0.0	New South Wales Tablelands	0.0
Cape York	0.0	Gippland & Western Districts	0.0
Western & South Western and Channel Country	0.0	Cape York	0.0
North Central Queensland and Atherton Tablelands	0.0	Western & South Western and Channel Country	0.0
		North Central Queensland and Atherton Tablelands	0.0
Charleville-Longreach	0.0	Charleville-Longreach	0.0
Eastern Darling Downs	0.0	Eastern Darling Downs	0.0
Darling Downs	0.0	Darling Downs	0.0
Northern Pastoral	0.0	Darling Downs	0.0
Kalgoorlie-Central Pastoral & Pilbara	0.0	South East	0.0

Sheep Specialists (1999-2000)

<i>Region</i>	<i>Av LR</i>	<i>Region</i>	<i>LR max</i>
South East	89.5	South East	108.0
Mallee	85.4	New South Wales Tablelands	98.5
New South Wales Tablelands	81.4	Mallee	94.7
Northern Tasmania, Midland & Huon	80.6	Riverina	91.7
Central Northern	78.8	Central & Southern Wheatbelt	89.1
Riverina	78.5	Wimmera	88.5
Central & Southern Wheatbelt	78.1	Central Northern	87.9
Gippland & Western Districts	76.8	Northern Pastoral	87.2
Mid North, Murraylands and York Peninsula	75.9	Northern Tasmania, Midland & Huon	87.0
South West	74.3	Gippland & Western Districts	86.7
Northern Pastoral	73.7	North West Slopes & Plains	86.6
Central West	72.7	South West	86.6
North West Slopes & Plains	72.0	Mid North, Murraylands and York Peninsula	84.3
Wimmera	71.1	Central West	83.5
Darling Downs	65.7	Western & South Western and Channel Country	81.8
Western New South Wales	64.8	Kalgoorlie-Central Pastoral & Pilbara	81.3
Western & South Western and Channel Country	61.1	Darling Downs	80.8
Charleville-Longreach	59.8	Western New South Wales	79.9
Eastern Darling Downs	59.8	Eastern Darling Downs	78.4
Kalgoorlie-Central Pastoral & Pilbara	57.6	Charleville-Longreach	77.6
Coastal New South Wales	0.0	Coastal New South Wales	0.0
Cape York	0.0	Cape York	0.0
		North Central Queensland and Atherton Tablelands	0.0
North Central Queensland and Atherton Tablelands	0.0	Eyre Peninsula	0.0
Eyre Peninsula	0.0	Northern & Eastern Wheatbelt	0.0
Northern & Eastern Wheatbelt	0.0		

Mixed Enterprises (1990-2000)

<i>Region</i>	<i>Av LR</i>	<i>Region</i>	<i>LR max</i>
South East	88.7	Eastern Darling Downs	110.7
Mallee	88.6	New South Wales Tablelands	99.1

Gippland & Western Districts	86.6	Gippland & Western Districts	98.2
Central Northern	85.0	Mallee	96.5
Mid North, Murraylands and York Peninsula	84.2	South East	95.7
New South Wales Tablelands	83.9	Northern Tasmania, Midland & Huon	94.7
Northern Tasmania, Midland & Huon	83.7	South West	93.0
Riverina	80.9	Central Northern	92.9
Central West	80.8	North West Slopes & Plains	91.9
South West	79.6	Mid North, Murraylands and York Peninsula	90.6
North West Slopes & Plains	79.4	Wimmera	88.2
Wimmera	78.8	Central West	87.6
Eyre Peninsula	78.7	Eyre Peninsula	87.2
Central & Southern Wheatbelt	77.9	Riverina	85.4
Eastern Darling Downs	77.7	Northern & Eastern Wheatbelt	84.6
Northern & Eastern Wheatbelt	75.7	Western New South Wales	84.0
Northern Pastoral	73.5	Northern Pastoral	83.8
Darling Downs	68.3	Central & Southern Wheatbelt	81.6
Western New South Wales	65.9	Charleville-Longreach	81.1
Charleville-Longreach	59.6	Darling Downs	77.9
Kalgoorlie-Central Pastoral & Pilbara	58.5	Western & South Western and Channel Country	74.5
Western & South Western and Channel Country	52.0	Kalgoorlie-Central Pastoral & Pilbara	59.5
North Central Queensland and Atherton Tablelands	44.8	North Central Queensland and Atherton Tablelands	56.3
Coastal New South Wales	0.0	Coastal New South Wales	0.0
Cape York	0.0	Cape York	0.0

2001-2005 Average and Maximum Lambing Rate by Regional Enterprise Type

Prime Lamb Specialists (2001-2005)			
Region	Av LR	Region	LR max
Central West	92.6	Central Northern	100.3
Central Northern	92.0	Central West	99.4
Wimmera	90.2	Northern Tasmania, Midland & Huon	97.7
Gippland & Western Districts	89.5	North West Slopes & Plains	96.6
South East	88.2	Eyre Peninsula	96.4
Mallee	88.1	South East	94.9
New South Wales Tablelands	87.1	New South Wales Tablelands	94.5
Eyre Peninsula	85.1	Mallee	93.9
Northern & Eastern Wheatbelt	83.9	Wimmera	93.7
Riverina	83.5	Gippland & Western Districts	92.5
Mid North, Murraylands and York Peninsula	82.6	South West	92.4
Northern Tasmania, Midland & Huon	82.4	Northern & Eastern Wheatbelt	89.9
Central & Southern Wheatbelt	79.7	Mid North, Murraylands and York Peninsula	88.3
North West Slopes & Plains	77.3	Riverina	88.1
South West	76.3	Central & Southern Wheatbelt	85.8
Western New South Wales	0.0	Western New South Wales	0.0
Coastal New South Wales	0.0	Coastal New South Wales	0.0
Cape York	0.0	Cape York	0.0
Western & South Western and Channel Country	0.0	Western & South Western and Channel Country	0.0
North Central Queensland and Atherton Tablelands	0.0	North Central Queensland and Atherton Tablelands	0.0
Charleville-Longreach	0.0	Charleville-Longreach	0.0
Eastern Darling Downs	0.0	Eastern Darling Downs	0.0
Darling Downs	0.0	Darling Downs	0.0
Northern Pastoral	0.0	Northern Pastoral	0.0
Kalgoorlie-Central Pastoral & Pilbara	0.0	Kalgoorlie-Central Pastoral & Pilbara	0.0

Sheep Specialists (2001-2005)

<i>Region</i>	<i>Av LR</i>	<i>Region</i>	<i>LR max</i>
South East	88.7	South East	97.2
Gippland & Western Districts	84.3	Central West	94.7
Central Northern	82.9	New South Wales Tablelands	93.6
New South Wales Tablelands	82.0	Northern Tasmania, Midland & Huon	93.5
North West Slopes & Plains	81.3	Central Northern	90.8
Central & Southern Wheatbelt	80.0	South West	90.5
Northern Tasmania, Midland & Huon	79.6	Central & Southern Wheatbelt	87.5
Wimmera	78.1	Western & South Western and Channel Country	85.8
Central West	76.8	Gippland & Western Districts	85.4
South West	76.8	Wimmera	84.2
Riverina	74.6	Mid North, Murraylands and York Peninsula	83.1
Mid North, Murraylands and York Peninsula	74.3	North West Slopes & Plains	81.3
Western New South Wales	59.3	Riverina	78.4
Northern Pastoral	52.3	Western New South Wales	75.0
Western & South Western and Channel Country	50.7	Northern Pastoral	68.0
Kalgoorlie-Central Pastoral & Pilbara	46.9	Charleville-Longreach	67.2
Charleville-Longreach	42.8	Kalgoorlie-Central Pastoral & Pilbara	46.9
Coastal New South Wales	0.0	Coastal New South Wales	0.0
Mallee	0.0	Mallee	0.0
Cape York	0.0	Cape York	0.0
North Central Queensland and Atherton Tablelands	0.0	North Central Queensland and Atherton Tablelands	0.0
Eastern Darling Downs	0.0	Eastern Darling Downs	0.0
Darling Downs	0.0	Darling Downs	0.0
Eyre Peninsula	0.0	Eyre Peninsula	0.0
Northern & Eastern Wheatbelt	0.0	Northern & Eastern Wheatbelt	0.0

Mixed Enterprises (2001-2005)

<i>Region</i>	<i>Av LR</i>	<i>Region</i>	<i>LR max</i>
Central Northern	94.5	Central Northern	98.9
Central West	88.2	Mallee	94.0

Wimmera	87.8	Central West	92.7
South East	87.0	Wimmera	92.7
Mallee	86.0	South East	92.0
Gippland & Western Districts	84.6	Gippland & Western Districts	87.8
Riverina	83.0	New South Wales Tablelands	87.6
Eyre Peninsula	81.6	Eyre Peninsula	87.1
Mid North, Murraylands and York Peninsula	80.1	Riverina	86.0
New South Wales Tablelands	79.5	Mid North, Murraylands and York Peninsula	84.6
Central & Southern Wheatbelt	79.1	North West Slopes & Plains	84.1
Northern Tasmania, Midland & Huon	78.9	Northern Tasmania, Midland & Huon	83.5
Northern & Eastern Wheatbelt	78.0	Central & Southern Wheatbelt	83.3
South West	76.3	Northern & Eastern Wheatbelt	82.6
North West Slopes & Plains	75.0	Northern Pastoral	81.5
Northern Pastoral	68.7	South West	80.3
Western New South Wales	65.4	Kalgoorlie-Central Pastoral & Pilbara	76.8
Eastern Darling Downs	64.3	Darling Downs	76.0
Charleville-Longreach	58.6	Western New South Wales	73.8
Kalgoorlie-Central Pastoral & Pilbara	56.8	Eastern Darling Downs	73.8
North Central Queensland and Atherton Tablelands	55.3	Charleville-Longreach	73.7
Darling Downs	50.5	North Central Queensland and Atherton Tablelands	71.5
Western & South Western and Channel Country	46.3	Western & South Western and Channel Country	64.0
Coastal New South Wales	0.0	Coastal New South Wales	0.0
Cape York	0.0	Cape York	0.0

Appendix 2 – ABARE Enterprise Type Definitions

The ABARE Farm Survey categorises enterprises in the Australian sheep industry as follows:

- *Prime Lamb Specialists* are defined as enterprises that derive at least 20 percent of farm receipts from the sale of prime lamb.
- *Sheep Specialists* are operations where sheep production is the primary focus, excluding prime lamb specialists.
- *Mixed Enterprise Sheep Operations* are operations where sheep is one of several enterprises, where the other enterprises could be other livestock or cropping activities.

These enterprise types can then be categorised as *regional enterprise sectors* according to their geographical location as determined by the Australian Agricultural and Grazing Industries Survey (AAGIS) regions. There are a total of 24 AAGIS Regions across Australia that host sheep enterprises and a total number of 59 regional sheep enterprise sectors. This is demonstrated in the figure below.

AAGIS Region	State	Prime Lamb	Sheep Specialist	Mixed Enterprise	Total
Western New South Wales	New South Wales	X	X	X	3
Northwest Slopes & Plains	New South Wales	X	X	X	3
New South Wales Tablelands	New South Wales	X	X	X	3
Coastal New South Wales	New South Wales			X	1
Central West	New South Wales	X	X	X	3
Riverina	New South Wales	X	X	X	3
Mallee	Victoria	X	X	X	3
Wimmera	Victoria	X	X	X	3
Central Northern	Victoria	X	X	X	3
Gippsland and Western Districts	Victoria	X	X	X	3
North Central Queensland	Queensland			X	1
Western & Southwestern Channel Country	Queensland		X	X	2
Charleville-	Queensland		X	X	2

AAGIS Region	State	Prime Lamb	Sheep Specialist	Mixed Enterprise	Total
Longreach					
Darling Downs	Queensland		X	X	2
Eastern Darling Downs	Queensland		X	X	2
Northern Pastoral	South Australia		X	X	2
Mid North, Murraylands and York Peninsula	South Australia	X	X	X	3
Eyre Peninsula	South Australia	X	X	X	3
South East	South Australia	X	X	X	3
Kalgoorlie & Central Pastoral	Western Australia		X	X	2
Northern & Eastern Wheatbelt	Western Australia	X	X	X	3
Central & Southern Wheatbelt	Western Australia	X	X	X	3
Southwest	Western Australia	X	X	X	3
Northern Tasmania, Huon & Midlands	Tasmania	X	X	X	3
				TOTAL	59