Producer Demonstration Sites (PDS)

Monitoring, Evaluation and Reporting (MER) Guidelines

What is MER?

Monitoring, Evaluation and Reporting (MER) has been clearly summarised in the following way[1]:

The process of MER is a key part of project management, accountability and reporting on the impact of the research, development, extension and adoption and, of course, practice change. MLA has developed a Monitoring and Evaluation Framework to guide the collection and reporting of data from PDS projects so as to inform and assist MLA in assessing the value of its investments, to more effectively report outcomes and benefits back to its stakeholders, and to continually improve the management of the PDS projects.

This brief guide is directed towards project facilitators who are overseeing/managing MLA funded PDS projects. It has resulted from extensive trialling of the concepts in MLA and elsewhere and will continue to be modified based on new needs and experience gained through its implementation.

Why is MER important?

As noted above, unless you have a very clear MER plan to guide the collection and reporting of data from PDS projects, and that plan is successfully implemented, it will be very difficult to determine whether the project has been beneficial; whether people directly and indirectly involved have obtained value from it; whether further benefits may accrue to the industry over time; and generally whether it has been a good investment by MLA on behalf of its levy payers and government (and thus to be able to report outcomes and benefits back to its stakeholders).

Key factors of MER

The MER framework is based on some simple yet important factors/questions which seek to obtain the necessary information to allow the project to be easily, yet comprehensively evaluated. Evaluation requires an understanding of processes used, producer engagement that occurred, practice change observed / measured and impact. These key factors are:

What did we do?

Simply describe all the inputs to and outputs from the project e.g.

- Project processes – plans and steering committee notes
- $ invested – and from where they came
- Number of participants – direct (core participants - involved in demonstration sites) and indirect (observer - part of a broader group or attending field days etc)
- Trial /demonstration data obtained – to demonstrate what we did
- Products and information documents produced and communicated

[1] Jeff Coutts and Gordon Stone of QualDATA

How well did we do it?

Measure whether anyone has changed their knowledge and awareness about the issue or their skills to influence it:

- Surveys of participants (those who are directly involved (core participants) and those that are indirectly involved (observers)) before and after the project/event to assess changes to Knowledge, Attitudes, Skills and perceived value in relation to the solution that is being demonstrated for producer consideration and possible adoption.

Has it changed what people do (have they adopted different practices)?

By participating in the project (or observing it) have people changed what they are doing?

- Have people made specific changes (adopted new practices / technologies) as a result of the project? If changes were made, what was the adoption scale (i.e. whole farm/business, partial)? Survey of core participants to benchmark the targeted practices and performance metrics before and after the demonstration. The purpose of the survey is to enable quantitative demonstration of practice change and improved performance outcomes.
- Will people be more likely to change practices in the future (intentions or aspirations)?

Is anyone better off?

- Are there any key lessons/learnings for other projects?
- Have people actually benefitted from the project and by how much?
- What are the costs and benefits from making these changes for individuals?
- Are more people likely to benefit in the future (core and observer participants)?
- What have we learnt that we expected?
- What have we learnt that we didn't expect?
- Are there any lessons for others/projects?

Is the industry better off?

- How might the broader industry benefit from the project? Who else might the practice change apply to (e.g. would others in the region be likely to adopt it?)
- Has this been communicated?

MER – step by step

To develop a monitoring, evaluation and reporting (MER) plan, the following six simple stages are proposed:

What is your objective or Key Result Area (KRA)

To start, you will need to define what it is you plan to achieve *within the life of your project*. Describe clearly what the objective of the project is seeking to achieve. Think about the objective from the perspective of changing a practice in your enterprise. Such objectives should be described in SMART terms

S – Specific
M – Measurable
A – Achievable
R – Relevant
T – Time-based

An example may be:

By (project end), the project will have demonstrated (outputs) new packages and calculator tools with (demographics) 20 producers to better link (practices) pasture dry matter measurements to decisions on optimum stocking rate –to improve (outcomes) the production of (species) beef per ha (indicative 15% increase) – applicable to 50% of the beef industry in state/area.

Refer to the Preliminary Application Guidelines for further information on objectives.

What business driver(s) (outcome) are you focussing on in the project?

Identify (refer to the application form) precisely what business driver(s)/practice change area/s your project will seek to address, and the associated productivity & economic KPI(s). Table 1 (refer below) assists applicants to identify the key practice change area/s and related productivity and economic KPIs that will need to be measured to assess success and impact of the project. The table then identifies what data is required to measure success against these KPIs.

The practice change areas identified relate to measuring on farm economic impacts only. Impacts of changes in on farm environmental and social variables are evaluated separately as part of the MLA triple bottom line evaluation framework.

Table 1 Productivity and economic impact data requirements by practice change area

Practice Change Area	Practice Change Types	Productivity KPIs	Data Required to Measure Productivity KPIs	Economic Impact KPIs	Data Required to Measure Economic Impact KPIs
Sheep reproductive efficiency	- Ewe nutrition (supplements) - Ewe CS management - Ewe pre-joining/joining management - Lambing management - Weaning management - Ewe culling strategy - Lambing date - Ram fertility management	Conception rate (%)	- No. ewes/ewe lambs joined - No. ewes/ewe lambs scanned in lamb i.e. W/D scanning percentage	Additional net profit: - $/Ewe - $/Ewe Lamb	- Net value of additional lambs weaned for a single, twin and triplet lamb. This will require costing of additional ewe energy requirements and management costs of additional lambs to weaning. - Net value per head of reduced ewe mortality. - Costs saved e.g. labour, supplementary feed. - Annualised implementation costs for the practice change over the life of the investment e.g. new fencing/water infrastructure, capital cost of new equipment/technology - Additional annual ongoing utilisation costs associated with the practice change e.g. pregnancy scanning, labour, supplements/fodder.
		Scanning percentage (%)	- No. foetuses scanned/ewes joined - % ewes with singles, twins and triplets if that data is available		
		Embryo loss (%)	- No. of foetuses scanned - Number of lambs born dead and alive.		
		Lamb survival rate (%)	- No. of foetuses scanned - Depending on how it is measured, no. lambs marked or no. lambs weaned.		
		Lamb marking and/or weaning rate (%)	- Number of ewes/ewe lambs joined. - Number of lambs marked or weaned.		
		Ewe mortality (%)	- Total number of ewes joined - Annual number of ewes deaths between joining and weaning/total annual ewe deaths.		

Practice Change Area	Practice Change Types	Productivity KPIs	Data Required to Measure Productivity KPIs	Economic Impact KPIs	Data Required to Measure Economic Impact KPIs
Beef reproductive efficiency	- Breeder nutrition (supplements) - Breeder CS management - Pre-joining/joining management - Calving management - Weaning management - Breeder culling strategy - Calving date - Bull fertility management	Conception rate (%)	- No. cows/heifers joined - No. cows/heifers preg. tested in calf (PTIC)	Additional net profit: - $/Cow - $/Heifer	- Net value of additional calves weaned. This will require costing of additional cow energy requirements and management costs of additional calves to weaning. - Net value per head of reduced breeder mortality. - Costs saved e.g. labour, supplementary feed. - Annualised implementation costs for the practice change over the life of the investment e.g. new fencing/water infrastructure, capital cost of new equipment/technology - Additional annual ongoing utilisation costs associated with the practice change e.g. pregnancy testing, labour, supplements/fodder.
		Calf mortality rate (%) or Calf survival rate (%)	- PTIC rate as above - Depending on how it is measured, no. calves marked or no. calves weaned.		
		Calf marking and/or weaning rate (%)	- Number of cows/heifers joined - Number of calves marked or weaned.		
		Breeder mortality (%)	- Total number of cows/heifers joined - Annual number of cow/heifer deaths between joining and weaning/total annual cow/heifer deaths		

Practice Change Area	Practice Change Types	Productivity KPIs	Data Required to Measure Productivity KPIs	Economic Impact KPIs	Data Required to Measure Economic Impact KPIs
Feedbase	- Pasture production - Weed management - Pest and disease control - Grazing management - Fodder crops	Stocking rate (DSE/ha, Adult Equivalent (AE)/ha, AE/km^2)	- Area impacted by practice change in ha or km^2 - DSE or AE impacted by practice change. - DSE or AE rating per head for relevant livestock categories impacted.	Additional net profit: - $/Hd - $/Ha or km^2	- Additional net income due to increased livestock production. - Additional net income due to increased fodder production. - Costs saved e.g. fertiliser, chemicals. - Annualised implementation costs for the practice change over the life of the investment e.g. new fencing/water infrastructure, pasture sowing costs, capital cost of new equipment/technology. - Additional annual ongoing utilisation costs associated with the practice change e.g. fertiliser, labour, chemicals.
		Kg/hd/day	- Start and end weight/hd (kg LW) - No. days between start and end weighings.		
		Kg/hd	- Average turnoff weight per head (kg LW or DW)		
		Kg /Ha or km^2	- Total kilograms produced (LW or DW) - Area grazed (ha or km^2)		
		T DM/Ha (conserved fodder)	- Tonnes dry matter produced - Area harvested (Ha)		

Practice Change Area	Practice Change Types	Productivity KPIs	Data Required to Measure Productivity KPIs	Economic Impact KPIs	Data Required to Measure Economic Impact KPIs
Animal wellbeing	- Disease management - Internal/external parasites - Predation - Stock handling practices	Mortality rate (%)	- Total head of livestock - No. annual livestock deaths due to health/welfare issue	Additional net profit: - $/Hd - $/ha or km^2	- Additional net income due to increased livestock production. - Net value per head of reduced livestock mortality. - Costs saved e.g. labour, animal health treatments. - Annualised implementation costs for the practice change over the life of the investment e.g. new livestock handling infrastructure, capital cost of new equipment/technology. - Additional annual ongoing utilisation costs associated with the practice change e.g. animal health treatments, labour.
		Lost productivity (kg/hd, kg/ha or km^2)	- Lost production due to health/welfare issue (kg LW) - No head or area (ha or km^2) impacted.		
Marketing	- Target markets - Selling time	Market (% turnoff to target markets)	- Total turnoff (kg LW or DW) - Kg sold into specific target markets (kg LW or DW)	Additional net profit: - $/kg - $/Hd	- Additional average price per kilogram due to practice change. - Costs saved e.g. labour, transport, selling costs. - Annualised implementation costs for the practice change over the life of the investment e.g. capital cost of new equipment/technology. - Additional annual ongoing utilisation costs associated with the practice change e.g. selling costs, feed costs, transport, labour.
		Product quality parameters vs market specs (% compliance to spec)	- Total kg sold into specific target markets - Total kilograms complying with specs for specific target markets		
		Selling time (% turnoff at specific times)	- Total kgs sold annually - Total kgs sold at specific times (e.g. seasonal turnoff)		

Practice Change Area	Practice Change Types	Productivity KPIs	Data Required to Measure Productivity KPIs	Economic Impact KPIs	Data Required to Measure Economic Impact KPIs
Genetics	- Setting a breeding objective - Using EBVs/ASBVs (including growth, yield, reproductive efficiency, carcase/eating quality and animal health related traits) - Using selection indexes	Product quality parameters vs market specs (% compliance to spec)	- Total kg sold into specific target markets - Total kilograms complying with specs for specific target markets	Additional net profit: - $/kg - $/Hd - $/Ewe or Ewe lamb - $/Cow or Heifer - $/Ha or km^2	- Additional average price per kilogram due to practice change. - Additional net income due to increased livestock production. - Costs saved e.g. animal health costs, feed costs. - Annualised implementation costs for the practice change over the life of the investment e.g. capital cost of new equipment/technology. - Additional annual ongoing utilisation costs associated with the practice change e.g. labour, genetic testing, genetics purchase costs.
		Kg/Hd/day	- Start and end weight/hd (kg LW) - No. days between start and end weighings.		
		Kg/Hd	- Average turnoff weight per head (kg LW or DW)		
		Lamb weaning rate (%)	- Number of ewes/ewe lambs joined. - Number of lambs weaned.		
		Calf marking or weaning rate (%)	- Number of cows/heifers joined - Number of calves marked or weaned.		
		Conception rate (%)	- Number of breeders (ewes/ewe lambs or cows/heifers) joined - No. breeders scanned/preg. tested in lamb or in calf.		

Practice Change Area	Practice Change Types	Productivity KPIs	Data Required to Measure Productivity KPIs	Economic Impact KPIs	Data Required to Measure Economic Impact KPIs
Business management	- Decision making/change management - Risk management - Labour efficiency/labour management - OH & S	Labour efficiency (DSE/FTE, AE/FTE, Ha or km^2/FTE)	- No. full time equivalents (FTEs) - Total livestock units (DSE/AE) - Total farm area (Ha/km^2)	Additional net profit: - $/Ha or km^2 - $/business	- Owner/operator labour allowance per FTE (manager versus unpaid family labour) - Costs saved e.g. improved OH&S, reduced staff turnover, labour. - Value of reduced risk due to practice change (i.e. change in probability by change in likely $ impact if risk eventuates)
		Staff retention rate	- No. annual staff turnover as percentage of total number of staff.		
		OH&S incident rate	- Number of OH&S incidents per year.		
		Risk exposure and impact	- Probability of risk occurrence (%) - Likely impact if risk eventuates ($)		

What metrics will you capture to demonstrate success?

Identify what metrics (measurements) may be available from your project. These will need to be measured before your project commences (e.g. baseline) and at the end so as to assess change. Examples include:

- Number of producers involved in demonstration sites (mandatory)
- Number of producers observing demonstration sites (mandatory)
- Number of head of livestock involved (mandatory)
- Area (ha) involved (mandatory)
- Costs of inputs for project (inputs, labour) (mandatory)
- Outcomes from demonstration sites (e.g. reproduction rate, weaning rate) (mandatory)
- Benefits from outcomes (e.g. $ value of increased weight gain) (mandatory)
- Knowledge/attitudes/skills of core and observer participants before and after project (mandatory)
- Producer practice (relevant to the topic/project) before and after project (mandatory)
- Measure of economic and productivity performance metrics before and after the project (mandatory)
- Field days held – examples of engagement
- Media/communication activities/events/outputs

How will you capture/measure these metrics?

Identify what measurement systems or approaches you will employ to capture the information required for the MER e.g.

- Records of inputs
- Steering committee notes regarding decisions
- Narratives from producers directly involved in the project and specific case studies on the value or impact from their involvement in the PDS
- Simple benefit cost analyses
- Media monitoring
- Event evaluations/feedback
- Pre and Post Surveys of the project for core producers and observers (mandatory)

Pre & Post Project Surveys

Pre project and post surveys of the core and observers producers is a requirement for all PDS projects. Pre-Project suryves are utilised to capture the necessary baseline demographic, knowledge and skills and practise data. The post project survey is to evaluate changes in these areas based on involvement in the project.

The general demographic data in Table 2 should be collected from all core and observer producers. Additional data on beef and sheep enterprises should be collected where the extension program aims to achieve practice change adoption for these enterprises (where relevant).

Baseline data on current management practices is essential for projects that specifically aim to increase adoption or effectiveness of a particular management practice (e.g. ewe pregnancy scanning, phosphorus supplementation, measuring soil moisture) to determine if and how participants are already undertaking these practices.

Table 2 outlines the Baseline Demographic and practises data that is required to be captured in PDS Projects MER.

Table 2: Baseline demographic data

Demographic data	Data collection requirements
General	Participants complete data collection as a business i.e. if multiple people from the same business are attending, only one form is completed for the business (excluding knowledge and skills which should be completed by all participants). - Business name - No. participants per business attending - Property address/es - Email address/es (for each business participant) - Phone number/s (mobile vs landline for each business participant) - Property size (Ha or km^2) - Area grazed (Ha or km^2) - Total cattle at date (e.g. 30th June) (Hd) - No. cows (Hd) - Total sheep at date (e.g. 30th June) (Hd) - No. ewes (Hd) - Permission to contact participants for follow-up evaluation
Beef enterprise	- No. cattle turned off per year (Hd) - Calving start date/s (DD/MM) - % cattle Bos indicus/tropical breeds e.g. Brahman - % cattle Bos taurus/British Breeds e.g Angus

Demographic data	Data collection requirements
	- % cattle Bos taurus-Bos indicus crosses e.g. Brangus
Sheep enterprise	- No. lambs turned off per year (Hd) - Lambing start date/s (DD/MM) - % lambs Merino - % lambs Merino cross - % lambs non-Merino
Management practices	- As PDS projects aim to increase the adoption of a specific practice (e.g. ewe pregnancy scanning, phosphorus supplementation of cattle, measuring soil moisture) it is necessary to assess baseline levels of current practice, including scale, frequency, methods and timing.

Measuring Attributable Adoption

It is important to capture the information required from participants in order to measure adoption, and then to attribute that adoption to their participation in the PDS project (Table 3).

Assessing attribution is about determining what the participant would likely have done anyway in relation to the practice change if they had not participated in the extension program. In some cases participants are already planning to make a particular change and will often report this as an intent to make a change in event surveys.

In these cases, assessment of attribution therefore assists to determine if their participation in the extension program was a catalyst for making the change sooner, and/or achievement of better results, and what other sources of information were also used in making the decision to implement change.

Table 3: Information required for measuring attributable adoption

Adoption	Attribution of Adoption
Producers	
- Intent to make a practice change/s (no. of producers) - Proportion of intentions that eventuate (%) - Actual practice change/s made (No. of producers) - Type of practice change/s made (description) - Scale of practice change made (i.e. No. livestock/area impacted)	- Would the same change have been at the same time anyway regardless of participation in the event/program (Probability) - Would the same change have been made at a later time anyway regardless of participation in the event/program (How much later) - Would the same change have been made on the same scale anyway (difference in scale with participation compared to without)

Adoption	Attribution of Adoption
- Dis-adoption of practice changes over time (%) - Timing of dis-adoption (year) - Timing of impacts commencing (year) - Time to peak impacts (years post adoption) - Timing of impacts declining (year) - Decline in impacts over time (%)	- Would the outcome of the change have been the same without participation in the event/program (difference in profit) - Were other sources of information/support required to make the change (Proportion of required info/skills to make the change obtained from event/program)

While some aspects of adoption & attribution of adoption can be captured and reported throughout the life of the project (through pre & post project surveying and other data collection methods), the majority to the data required to align attribution to impact is captured through survey participants a considerable time after the project has completed (including secondary impact examination - e.g. producers who have changed practices the following year or the amount of a particular product used 2 years after the trial). Such surveys are the responsibility of MLA, not the project.

Compilation and reporting

Ensure you keep a good record of all the information you are capturing and include it in Milestone reports at every opportunity. The MLA reporting templates will ensure consistency of data reporting.

Keep it simple!

The art to a good MER is keeping everything as simple as possible. This will ensure you capture the information you absolutely need at minimum cost and do so in a form that can allow clear evaluation of the project and reporting of its outcomes to stakeholders.

1. An example MER plan

The following is a simple worked example of a generalised MER for a PDS project. It is provided for guidance purposes only.

Practise Change Area/Practrise Change Type/Productivity KPI:

Animal wellbeing	- Disease management - Stock handling practices	Mortality rate (%) – measured between marking and weaning

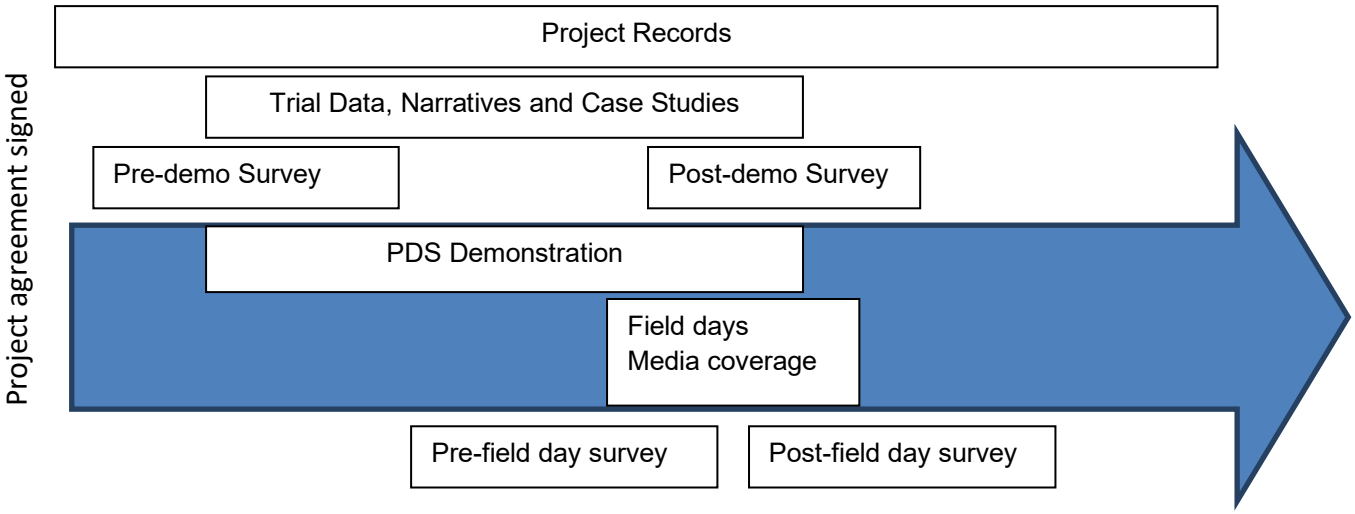
Evaluation level	**Generic Performance Measures**	**Project Performance Measures** *(Please fill in and delete example)*	**Evaluation Methods** *(Please fill in and delete example)*
Inputs – What did we do? *Describe the planned and expected inputs involved in your project*, including *funds, resources, development & projects structures*	• Number of core producers involved in demonstration sites & their demographics • Number of producers observing demonstration sites & their demographics • Number of head of livestock involved • Area (ha) involved • Project steering committee decisions and notes • Investments ($'s) from MLA and other parties (cash and in-kind contributions) and what was purchased – professional time, project inputs	• 10 on-farm demonstrations sites representing 10,000 head of cattle • 50 observers covering 40,000 head of cattle • Funds: $25k p.a. from MLA used for professional fees, travel and field days • Funds: $50kp.a. in kind contributed to vaccines and professional time • Project manager appointed • Steering committee appointed and meeting twice a year	○ Good records of all project plans and activities ○ Project steering committee notes

Outputs - What did we do? *Describe the outputs planned/expected from your project, including engagement activities & products from demonstration sites*	• Outputs from demonstration sites (new knowledge & data) (e.g. reproduction rate, weaning rate, mortality rate, gender, management methods, cost of vaccine, extra labour and cost of production) • Field days held, demographics collected, and M&E conducted • Media events/outputs	• New knowledge & data from the 10 demonstration sites • Annual Field day targeting 50 producers representing 40,000 head of cattle • New information package developed on the value of vaccination • Extension and communication activities e.g. 3 field days held • 5 media releases	○ Data from demonstration sites in milestone reports ○ Compilation of media activities ○ Copies of information package developed
Changes in knowledge, attitudes and skills - How well did we do it? *Describe the changes in KASA that you are planning to achieve.*	• Change in knowledge/attitudes/skills of **core and observer** participants before and after project/activity • Experience of producers involved in the PDS – extent to which they found the project/ activity useful or of value. • What was most helpful in supporting capacity change?	• X% of **core** producers have greater knowledge of the value of vaccinations and other animal management practices • Y% of core producers have increased their skills and confidence in animal husbandry practices • Y% of **observer** producers have greater knowledge of the value of vaccinations and other animal management practices • Key findings	○ Narratives and Case Studies from people involved in the PDS ○ Pre project surveys – (baseline) and post project survey ○ Post event survey/feedback sheets (e.g. field day) that assess changes
Practice changes – Has it changed what people do? *Describe the practice changes that you are expecting to achieve by the end of your project*	• Producer (core & observer) practice (relevant to the topic/project) before and after project • The extent of practice change adoption (# of cattle) and where • Influence the project had on practice change achieved	• 10 core participating producers representing 10,000 head, adopt single shot clostridial vaccination • 50 additional producers (totalling 40,000 head) intend to adopt single shot clostridial vaccination as a result of interacting through the PDS via field days	○ Baseline surveys (practice change and impact) – as above

Benefits – Is anyone better off? *Describe the benefits that you are expecting to achieve as a result of the project*	• Benefits from outcomes (e.g. $ value of decreased mortality rate compared to baseline) • Costs to achieve outcomes (e.g. increased inputs, labour) • Benefit Cost and Sensitivity analyses at the business level • What are the unintended/unexpected benefits or consequences? • Project learnings, barriers / enablers to adoption	• 10 core participating producers representing 10,000 head, adopt single shot clostridial vaccination resulting in a reduced weaner mortality of 3% • Enterprise productivity improves by x% • Improved understanding of what the main barriers and enablers to adoption of these techniques may be	○ Data from demonstration sites ○ Benefit Cost Analysis (BCA) at enterprise level ○ Longer term surveys and data capture on impacts (e.g. reseller information)
General observations / outcomes – Is the industry better off?	• Potential impacts (practice change & productivity) at the end of the project and well after the project has concluded (e.g. 2 years later) for the broader target audience • BCA of broader industry impact (productivity, profitability, environmental & social) •	• Single shot vaccination adopted by x producers by 20xx • Single shot vaccination is relevant to x% of industry, and if adopted by the target audience has the potential to deliver industry benefits of $xm p.a. and reduce industry mortality rates by 3% • This project will assist MLA in reducing the cost of endemic disease and improve animal welfare	○ Surveys of key personnel at the completion of project, and in one or two years' time ○ Extrapolation of BCA results to relevant part of the industry

2. Chronology of PDS data collection

This flow chart provides a clear time-based illustration of key timings for data-collection during a project.



Notes:

- Pre-demonstration surveys establish a baseline measure of knowledge, skill, attitudes and practices in relation to the issue in question e.g. Do producers already vaccinate and if so why and if not why not?; What is the biggest impediment to changing practices?
- Post-demonstration surveys will assess if the project has made any difference to knowledge, skill, attitudes and practices in relation to the issue in question.
- Similar to pre- and post- field day surveys
- Follow-up surveys would occur at least 6 months (most likely 12 to 24 months) after completion of the PDS and would help determine the changes made on-farms as a result of participating to the PDS and their benefits. The surveys may be formal – or from third parties – for example sales of vaccines. Follow up surveys are the responsibility of MLA, and not part of the project. It is important that authorisiation to contact core & observer producers for future follow up is collected throughout the project and provided to MLA as a part of the final MER.