Final report

Producer Adoption M&E Framework and Impact Assessment FY2020-21

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Abstract

Meat & Livestock Australia (MLA) aims to report annually on the impact from investment in its Producer Adoption Program. In order to achieve this, this project developed a producer adoption M&E Framework that identifies data collection requirements for assessing on-farm economic impact of MLA investment in extension products. This framework was developed by identifying key practice change areas and related data requirements in consultation with MLA and external service providers.

As part of this development, the Framework was used to assess current extension products and projects to identify gaps in data collection requirements for M&E and to provide recommendations for addressing those gaps.

In addition, the project provided an updated impact assessment of relevant extension products for 2020-21, so as to provide interim data for the 2025 impact assessment. Total cumulative net present value of on-farm benefits from investment in the extension products reviewed between 2015 and 2021 is estimated at $802.8 million, with the vast majority of benefits coming from investment in Category C products ‘Profitable Grazing Systems’ (28%) and ‘Producer Demonstration Sites’ (21%), and ‘EDGEnetwork’ (42%, Category B). The total annual net benefit at financial year 2022 was estimated at $52.6 million.

Executive Summary

Meat & Livestock Australia (MLA) works in partnership with industry and government to deliver research, development and extension (RD&E) activities that contribute to producer profitability, sustainability and global competitiveness, in addition to provision of marketing services to facilitate growth in consumer demand for red meat. In undertaking these activities, MLA are required to conduct a 5-year impact assessment of all marketing and RD&E investments as part of their Statutory Funding Agreement. Consultant findings from the 2015-2020 Productivity (On-Farm) and Feedlot impact assessment included a range of recommendations for improving M&E data collection for assessing impact of MLA investment in producer adoption.

Following on from these findings, Beattie Consulting Services and Inspiring Excellence were engaged by MLA for this project to:

1. Develop an extension focused M&E framework that clearly identifies the M&E related data required at each stage of the extension program that can be utilised within a related project.
2. Provide an assessment of how well the above framework has been implemented in MLA's key producer adoption products and related projects, together with any relevant recommendations and actions for addressing any gaps and implementing the framework for new projects containing an extension component.
3. Provide 2020-21 adoption and impact BCA reports for agreed medium/high impact producer adoption products, suitable for updating MLA's ROI model.

These objectives were achieved in full via a process of engagement with MLA Adoption Team members and extension service providers during development of the M&E Framework, assessment of relevant products against the M&E Framework and completion of the impact assessment.

Key Findings/Results

M&E Framework Development

- The M&E Framework developed in this project is provided in Appendix A. The Framework consists of four components:
    1. Identification of key practice change areas and related productivity and economic KPIs that need to be measured to assess impact, along with associated data requirements.
    2. Collection of baseline data from participants.
    3. Measurement of adoption and attribution of practice changes made by participants.
    4. Guidelines for who collects the data, when, how often and using what methods.
- Feedback received on the draft Framework indicates that stakeholders (MLA staff and external service providers) are largely comfortable with the content in relation to the four components identified above, however there was concern regarding how the Framework would be implemented in practice. These concerns mainly related to variation in the current M&E knowledge and skill levels of service providers, financial resources required for implementation, additional

time required for implementation and motivation among service providers and producers for additional data collection activities where required.

- Four appendices to the Framework document in Appendix A provide additional information and guidance to assist with implementation and addressing the above concerns.
- An example Excel user interface for the Framework was also developed as a potential tool to support implementation of the Framework.
- To ensure that it remains relevant and useful, the Framework will need to continuously evolve and be updated as it begins to be implemented and as new adoption products are developed and delivered over time.

Product Assessment Against M&E Framework

- A detailed summary of the results from assessment of adoption products against the Framework is provided in Appendix B. Of the 28 products reviewed, 12 were not assessed against the Framework. The main reasons products were not included in the assessment were:
  - Achieving producer adoption is not a product objective. Whether or not these products should have achieved producer adoption as an objective is another question which needs to be reviewed for each product.
  - The product is still in the development phase and insufficient detail was available around planned extension activities and/or there was no MER plan.
  - The product is a tool/enabler where attributable adoption is unable to be measured.
  - The product is not expected to contribute significant adoption (scale too small or adoption limited).
  - The product/project is complete with no future funding planned.

- General observations from the assessment of products against the M&E Framework included:
  - Attribution scored poorly for most products assessed as it had not been factored in to MER plans.
  - Products with a research component, such as ‘Producer Demonstration Sites’ (PDS) and ‘Producer Research Sites’, were generally able to meet requirements for measuring productivity and economic impacts, but often lacked processes for data collection to measure adoption, and particularly attribution, especially among observer type producers.
  - Products that were more focused on information sharing or training activities typically lacked the ability to identify productivity and economic impacts of practice changes made, but had processes in place to capture some aspects of adoption, generally as an intent to make a change.
  - For many projects, data was collected around an ‘intent to adopt’, but there was no follow-up to assess actual adoption and dis-adoption.

- Most products had some baseline data collection but many had missing elements, a key one being the ability to identify how many businesses are engaged in addition to the number of participants to ensure that adoption and impact are not double counted for more than one participant per business.
- General lack of documentation to identify if livestock advisors are a target audience or not, and if they are, collection of data specifically tailored to advisors.

Feedback from both the MLA Adoption Team and external extension service providers indicates a need for further support and guidance around how to collect the required data for assessing impact of adoption products.

Impact Assessment

- Eight of the products reviewed for this project were able to be assessed for impact. The main reasons as to why the other products assessed against the M&E Framework were not also assessed for impact included:
  - The product was still under development or in the initial stages of delivery and no adoption/attribution and impact data was available yet.
  - M&E processes need to be modified to allow for collection of adoption/attribution and impact data in the future.
  - There was insufficient data available to enable adoption/attribution and impact to be calculated.
- Total cumulative net present value (NPV) of on-farm benefits from investment in the extension products reviewed between 2015 and 2021 is estimated at $802.8 million[1]. The vast majority of benefits came from investments in Category C products 'Profitable Grazing Systems' (28%) and 'Producer Demonstration Sites' (21%), and 'EDGEnetwork' (42%, Category B).
- The total annual net benefit[2] at financial year 2022 was estimated at $52.6 million.
- Across all products, the type of practice changes that typically return the highest net benefits per unit of adoption to producers over time relate to feedbase changes. In addition to the estimated net benefit per unit of adoption, the rate of adoption also drives the total NPV for a product. Adoption rates for Category C products, such as 'Profitable Grazing Systems', are typically much higher than those for Category A and B products.
- There are various limitations and uncertainties associated with the estimates of economic impact and adoption provided for this assessment. These include:
  - MLA's existing data sets are less than ideal for measuring annual on-farm economic impact of extension products. This means that rather than basing annual assessment of impact on participant data and information, estimates need to be made based on either a limited amount

[1] The NPV calculation used a 5% discount factor, with a baseline year of 2025.
[2] Net benefits include the adoption or implementation cost, but exclude MLA project costs.

of historical participant data from the same product, limited historical participant data from a different product, or where no participant data exists, best estimate assumptions are required.

- Non-producer participants in adoption products are not represented in M&E.
- M&E data collection, collation, analysis, interpretation and reporting processes are not consistent across extension products and there are opportunities to improve each of these processes. The issues identified and suggested improvements are discussed in section 12.0 of this report.

- There is a need for a consistent approach across all MLA extension products for measuring on-farm economic impact across agreed key practice change areas to enable more accurate impact assessments of this kind to be completed in future.

Recommendations

Five key recommendations have been made to support the improvement of M&E processes and transitioning to the new adoption M&E Framework:

1. A review of all ongoing adoption product and related project aims, objectives and outcomes to ensure that they include adoption and impact targets and measures, and their M&E plans are in alignment with the new adoption M&E Framework.
2. Include contractual requirements for all new extension products to ensure that product M&E processes align with the new M&E Framework.
3. A review of current evaluation methodologies utilised to capture data and development of standard methods/templates and data storage systems to ensure data is captured and stored appropriately for each product.
4. Development and support of extension M&E capability and capacity in personnel overseeing evaluation within products/projects.
5. Appointment of an MLA M&E data manager to oversee the implementation of the adoption M&E Framework in addition to implementation of recommendations 1- 4 above.

Further details around these five key recommendations are provided in section 6.0 of this report.

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1.0 Background

Meat & Livestock Australia (MLA) works in partnership with industry and government bodies to deliver research, development and extension activities (RD&E) that contribute to producer profitability, sustainability and global competitiveness, in addition to provision of marketing services to facilitate growth in consumer demand for red meat.

In undertaking these activities, MLA is required to conduct a 5-year impact assessment of all marketing and RD&E investments as part of their Statutory Funding Agreement. Consultant findings from the 2015-2020 Productivity (On-Farm) and Feedlot impact assessment included a range of recommendations for improving M&E data collection for assessing impact of MLA investment in producer adoption.

Following on from these findings, this project involved developing a producer adoption M&E Framework that identifies data collection requirements for assessing on-farm economic impact of MLA investment in extension products. As part of this development, the Framework was used to assess current extension products and projects to identify gaps in data collection requirements for M&E and to provide recommendations for addressing those gaps.

In addition, the project provided an updated impact assessment of relevant extension products for 2020-21, so as to provide interim data for the 2025 impact assessment. It is MLA's intent to update this on an annual basis, so as to provide interim and final estimates of impact for the 2020-25 impact assessment period.

2.0 Objectives

The specific project objectives were to:

1. Develop an extension focused M&E framework that clearly identifies the M&E related data required at each stage of the extension program that can be utilised within a related project. Baseline demographic data requirements will be separated from practice change area specific data, with the latter focused on measuring attributable adoption and impact data in a format suitable for integration into MLA's ROI modelling.

   The framework is to be presented as an MS Word template that can be incorporated into new or existing products and projects containing an extension component.

2. Provide an assessment of how well the above framework has been implemented in MLA's key producer adoption products and related projects, together with any relevant recommendations and actions for addressing any gaps and implementing the framework for new projects containing an extension component.

3. Provide 2020-21 adoption and impact BCA reports for agreed medium/high impact producer adoption products, suitable for updating MLA's ROI model.

3.0 Methodology

3.1 M&E Framework Development

Development of the Framework used the following methodology:

- Identification of key value propositions and practice change areas for all relevant MLA extension products and projects. The practice change areas identified in the 2015-2020 impact assessment were used as a starting point.
- Identification of key indicators for impact and adoption for each of the practice change areas.
- Identification of key data requirements for measuring success for each indicator. This included data for the baseline scenario and data relating to the practice change (adoption, productivity and $ income and cost impacts).
- Identification of data required for baseline demographic indicators.
- Outlining of appropriate timing (e.g. initial engagement, during an activity, post activity follow-up), frequency of data collection (e.g. once only, at each event, annually, at critical times of the year) for measuring impact and who is responsible for collection (e.g. group co-ordinator/facilitator, service provider with specific expertise required, external evaluator.
- Incorporation of all the above information into a simple, generic draft M&E Framework that can be utilised by MLA and relevant service providers for all MLA extension products.
- Review of the draft framework by MLA Adoption Team members and 6 external extension service providers to provide feedback.
- Completion of the final framework based on feedback received. The Framework is to be included as an appendix to the current MLA producer adoption M&E framework[3].

3.2 Product Assessment Against M&E Framework

Product assessment against the Framework used the following methodology:

- Identification of which MLA extension products (medium/high estimated impact) were to be included in the assessment.
- Identification of current data collected and data collection processes for each agreed product and for all relevant adoption projects within key product areas.
- Assessment of current M&E processes against the requirements for the M&E Framework to identify any gaps and make relevant recommendations for actions required for alignment with the Framework.
- Recommendations for M&E resourcing and roles required for annual data collection, including estimated costings on the collection e.g. what can or should be collected by service providers, MLA staff or by third parties such as a consultant for impact data collation.

[3] 1. MLA Evaluation Framework Guide (Detailed) Highest level document for ALL evaluation across MLA.
2. MLA Producer Adoption MER Framework. Subset of the above just for adoption type programs – but still high level.
3. Detailed guide to implementing 2) above i.e. the framework from this project. To be added into the above document as an appendix.

- A detailed report on findings and recommendations for each product from the above four activities for internal use only.

For the Framework to apply for a product the following four criteria were used:

1. The product involved delivery of extension activities directly to producers/advisors
2. The purpose of that extension was to achieve significant producer/advisor adoption
3. That producer/advisor adoption was able to be directly attributed to the project extension activities.
4. The on-farm impacts of that adoption were able to be measured in economic terms.

Data collection was assessed and scored against each of the following five elements of the M&E Framework:

- Baseline data collection – Table 2 of the M&E Framework: Participant contact details, general demographic data, permission for follow-up contact for evaluation purposes, and in some cases includes baseline practices around specific management areas related to the product.
- Measuring productivity impact – Table 1 of the M&E Framework: Collection of data that allows for estimates of productivity improvements resulting from management changes made across a range of identified key practice change areas.
- Measuring economic impact – Table 1 of the M&E Framework: Assessment of economic impact (additional net profit) in terms of either valuing productivity improvements and/or reduced costs resulting from management changes made across a range of identified key practice change areas.
- Measuring adoption – Table 3 of the M&E Framework: Assessing the number of producers who make a change, the timing of the change and the number of adoption units (e.g. area/no. livestock) impacted by the change for each producer.
- Assessing attribution of adoption and impact – Table 3 of the M&E Framework: Estimating the degree to which involvement in the MLA project contributed toward the decision to make a practice change and the level of benefits received as a result of making that change.

Recommendations were made for what is required for each product to align data collection with the M&E Framework, along with estimates of any additional resources required to implement the recommendations. Individual product assessment reports have been provided as separate documents to this final report.

3.3 Impact Assessment

Conducting an updated adoption product impact assessment for 2020-21 used the following methodology:

- Identification of which MLA extension products were to be included in the impact assessment.
- Identification for each relevant product, which extension projects were to be included in the assessment e.g. ‘PDS’ projects within the ‘PDS’ product area.

- Collection of available outcome and impact data relevant to delivery during the 2020/21 year. This involved MLA project leaders and relevant external service providers providing available milestone reports, project reports, data spreadsheets etc.
- Engagement with relevant project leaders as required to obtain additional data/information required for the impact assessment and to assist with validation of any assumptions made.
- Completion of Benefit Cost Analyses for all product areas where sufficient data and information was available to make an assessment, and identification and documentation of any projects where insufficient data was available to make an assessment.

The list of products evaluated for this impact assessment is provided in Table 1.

Table 1: Extension products evaluated

Product Category	Product Code	Output (Product)
Producer Adoption – Category A	P00567/ p00410	Awareness forums & activities (BeefUp, MeatUp)
Producer Adoption – Category B	P00386/ p00138	Influence & motivate activities (BredWell FedWell, EDGEnetwork)
Producer Adoption – Category C	P00308	Producer Demonstration Sites (PDS)
Producer Adoption – Category C	P00405	Profitable Grazing Systems (PGS)
Productivity (On Farm)	p00443	Northern Australia Climate Program
Productivity (On Farm)	p00517	Lamb Survival/Weaning Productivity Tools and Practices

4.0 Results

4.1 M&E Framework Development

The M&E Framework developed in this project is provided in Appendix A. The Framework consists of four components:

1. Identification of key practice change area/s and related productivity and economic KPIs that need to be measured to assess impact, along with associated data requirements (Table A1).
2. Collection of baseline data from participants (Table A2).
3. Measurement of adoption and attribution of practice changes made by participants (Table A3).
4. Guidelines for who collects the data, when, how often and using what methods (Table A4).

Feedback received on the draft Framework indicates that stakeholders (MLA staff and external service providers) are largely comfortable with the content in relation to the four components identified above, however there was concern regarding how the Framework would be implemented in practice. These concerns mainly related to variation in the current M&E knowledge and skill levels of service providers, financial resources required for implementation, additional time required for implementation and motivation among service providers and producers for additional data collection activities where required.

Four appendices to the Framework document in Appendix A provide additional information and guidance to assist with implementation. These include:

- Appendix A1 provides an example of how the Framework is applied to an extension project.
- Appendix A2 provides an example of an impact M&E plan which is aligned to the M&E Framework.
- Appendix A3 details the relationship between current MLA extension related products and their key practice change areas.
- Appendix A4 outlines suggestions for how data collection can be built into delivery of extension projects.

An example Excel user interface for the Framework was also developed as a potential tool to support implementation of the Framework. The tool enables the user to filter the content of the larger framework for the specific needs of their project/program. This user interface is not intended as a stand-alone tool, but to be used in conjunction with the whole framework and the more detailed explanations provided in the word document, or with a simplified version of the framework document for each specific product area. The tool could be used during project planning and development of M&E plans and during development of data collection methodologies and templates. The concept of a user interface could initially be tested with MLA Adoption Team members and if it is considered to have value, it could then be shared with some key service providers for initial input on the concept.

The tool provided is not intended to be a perfect working example of what a final tool might look like, it is to give an idea of the purpose of such a tool. If the concept is considered by both MLA and service providers to be a useful way of assisting to use the broader framework, MLA would need to develop a stand-alone tool for this purpose with input from both MLA staff and external service providers who would be using the tool.

To ensure that it remains relevant and useful, the Framework will need to continuously evolve and be updated as it begins to be implemented and as new adoption products are developed and delivered over time.

4.2 Product Assessment Against M&E Framework

A detailed summary of the results from assessment of adoption products against the Framework is provided in Appendix B. Of the 28 products reviewed, 12 were not assessed against the Framework. Table B1 in Appendix B presents a summary of which products and related projects were not assessed against the Framework and reasons why. The main reasons products were not included in the assessment were:

- Achieving producer adoption is not a product objective. Whether or not these products should have achieved producer adoption as an objective is another question which needs to be reviewed for each product.
- The product is still in the development phase and insufficient detail was available around planned extension activities and/or there was no MER plan.
- The product is a tool/enabler where attributable adoption is unable to be measured.

- The product is not expected to contribute significant adoption (scale too small or adoption limited).
- The product/project is complete with no future funding planned. Only one of these products was able to be assessed for impact, with others either already having been assessed previously with no new data available, or insufficient data was available to assess impact (Table B1, Appendix B).

Sixteen of the 28 products reviewed were assessed against the M&E Framework. Table B2 in Appendix B presents details of which products and related projects these were and scores for the different areas of assessment.

General observations from the assessment of these products against the M&E Framework included:

- Attribution scored poorly for most products assessed as it had not been factored into to MER plans.
- Products with a research component, such as PDS and PRS projects, were generally able to meet requirements for measuring productivity and economic impacts, but often lacked processes for data collection to measure adoption, and particularly attribution, especially among observer type producers.
- Products that were more focused on information sharing or training activities typically lacked the ability to identify productivity and economic impacts of practice changes made but had processes in place to capture some aspects of adoption, generally as an intent to make a change.
- For many projects, data was collected around an 'intent to adopt', but there was no follow-up to assess actual adoption and dis-adoption.
- Most products had some baseline data collection, but many had missing elements, a key one being the ability to identify how many businesses are engaged in addition to the number of participants to ensure that adoption and impact are not double counted for more than one participant per business.
- General lack of documentation to identify if livestock advisors are a target audience or not, and if they are, collection of data specifically tailored to advisors.
- Several of the new, larger projects, such as NB2 and the T90 project, have solid plans in place for good data collection. The challenge moving forward will be in executing data collection processes that enable accurate collection of this data from the target audiences.

Reports for each product reviewed, both those assessed and those not assessed against the Framework, accompany this report as separate documents. An example report for the 'BeefUp' product is provided in Appendix C.

4.3 Impact Assessment

Eight of the products reviewed for this project were able to be assessed for impact. The main reasons as to why the other products assessed against the M&E Framework were not also assessed for impact included:

- The product was still under development or in the initial stages of delivery and no adoption/attribution and impact data was available yet.

- M&E processes need to be modified to allow for collection of adoption/attribution and impact data in the future.
- There was insufficient data available to enable adoption/attribution and impact to be calculated.

The following section provides an overview of the products that were assessed for impact and the assessment results.

4.3.1 Overview of Products

Five of the nine products reviewed were previously evaluated for the 2015-20 impact assessment. The 2020-21 impacts are thus additive to these earlier impacts, and it is MLA's intention to repeat this assessment on an annual basis up to 2025. This will allow annual impact assessments, leading to a full impact assessment for the 2021-25 impact assessment period. Caution should however be exercised in comparing individual year returns at a product level, as these are dependent on the data available at that time, as well as the actual practice change being measured.

Producer Adoption

4.3.1.1 Awareness forums and activities (BeefUp and MeatUp)

BeefUp

Estimated impact: Medium

'BeefUp' is a one-day forum aimed at creating awareness of key issues, MLA programs, best practice and new research data. It is run in northern Australia and began in 2010. The forums utilise leading industry experts and consultants to deliver key messages. Participants are sign-posted to other programs and sources of information for follow-up afterwards. It is considered to be a 'feeder activity' to other programs i.e. creates awareness and appetite for other MLA programs. These events are low cost one day activities held in regional locations that allow northern cattle producers to easily engage with MLA in their local areas. Since the previous impact assessment of 'BeefUp' conducted in 2019, four events have been run which have involved 232 producer participants across the northern cattle producing regions of Australia.

MeatUp

Estimated impact: Low

MLA's 'MeatUp' Forums aim to present clear and practical take home messages and encourage producers to implement practice change on-farm, assisting northern beef producers to lift productivity and profitability. 'MeatUp' events also encourage producers to register their interest in delivery programs such as 'PDS', 'EDGEnetwork' and 'PGS'. 'MeatUp' commenced in 2021 and to date five events have been run involving 174 producer participants.

4.3.1.2 Influence and motivate activities (BredWell FedWell and EDGEnetwork)

BredWell FedWell (Sheep and Southern Beef)

Estimated impact BWFW Sheep: Low

Estimated impact BWFW Southern Beef: Low

BredWell FedWell (BWFW) is a practical, one day workshop focused on the key production benefits of genetics with improved feed management to improve reproduction. It focuses on the importance of combining genetics and feed management to enable optimal improvement in performance and therefore farm profit. For industry to benefit from the results of research and development into sheep/cattle genetics and feeding, a pathway to adoption is required that tailors the relevant information within the context of sheep and beef farming systems to allow rapid uptake. The 'BWFW' Sheep and Southern Beef workshops allow producers to explore the usefulness of genetic tools (ASBVs and indexes) combined with setting of breeding objectives and best practice feeding of ewes/cows to achieve optimal reproductive performance in their enterprises. Since the previous impact assessment of 'BWFW' conducted in 2019, a further 17 'BWFW Southern Beef' events have been delivered involving 370 producers, and a further 13 'BWFW Sheep' events have been delivered involving 211 producers.

EDGEnetwork (Northern and Southern)

Estimated impact EDGEnetwork Northern: High

Estimated impact EDGEnetwork Southern: High

EDGEnetwork® (EDGE) is a suite of specialised training workshops that have been developed and targeted primarily to northern Australian beef, sheep and goat producers to improve livestock production and enterprise profitability and sustainability. These workshops have been used for more than a decade to lift the awareness of MLA and collaborator–funded research and development outcomes and to accelerate the adoption of best management practices. In recent years, Business EDGE has been adapted for the southern region for beef and sheep producers.

MLA requires an extension pathway to adoption that allows northern beef, sheep and goat producers to access the latest information and skills to improve their livestock enterprises. The suite of EDGE workshops allows participants to develop skills in business, nutrition, grazing, land management and breeding. In this assessment period, 736 participants representing 465 businesses have participated in 58 workshops (Southern EDGE = 171 businesses).

4.3.1.3 Producer Demonstration Sites

Estimated impact: Medium

Producer Demonstration Sites aim to increase the rate of adoption of key management practices and technologies that improve business profitability, productivity and sustainability. This is achieved through supporting livestock producers working in peer-to-peer groups to pursue new skills, knowledge and management practices applicable to their own commercial livestock production systems. Producer Demonstration Sites offer a producer focused and driven process for increasing the rate of adoption of existing and newer technologies and management practices. Four PDS projects were included in the impact assessment.

4.3.1.4 Profitable Grazing Systems

Estimated impact: High

'PGS' is a group-based delivery program that uses Supported Learning Programs (SLPs) to deliver training and coaching over a number of months to a year to improve producer's skills and knowledge. The aim is to achieve on-farm practice change in areas of farm production and management covered by the SLP. Each SLP aligns to the curriculum areas of People, Business, Reproduction and Genetics, Value Chain and Feedbase. Since the previous impact of assessment of 'PGS' in 2019, a further 29 events have been run involving 280 producer participants.

Productivity (On Farm)

4.3.1.5 Lamb survival /weaning productivity tools and practices

Estimated Impact: Low

The project assessed for this product aimed to quantify the effects of mob size and stocking rate on the survival of Merino and non-Merino lambs born across southern Australia to deliver improved recommendations for sheep producers regarding the allocation of ewes to mobs and paddocks at lambing. The project also aimed to assist producers to make more informed decisions about the cost-benefit of investing funds in paddock subdivision through permanent or temporary fencing to improve reproductive performance and farm profitability.

4.3.1.6 Northern Australia Climate Program

Estimated Impact: Medium

The Northern Australia Climate Program (NACP) addresses industry and community needs for climate science and information in northern Australia regarding research, development and extension that were identified in four surveys conducted between 2016 – 2017. The research focuses on improving the basic science and operational skill of seasonal, sub-seasonal (multi-week) and multi-year climate forecasting systems and developing customised tools of direct relevance to the northern Australia red meat industry. As such, this research component has three sub-projects 1) model improvement 2) multi-year prediction and 3) product development (e.g. flash droughts, wet season onset, wet season break).

4.3.2 Parameter estimates for the impact assessment

Key results for the impact assessment analysis are provided in Table 2.

Table 2: Key impact assessment results by product

Product Name/ Code	Category	Adoption start and peak year	Peak number and units adopted	Net Benefit by Practice Change Area*	% Benefit due to cost savings and productivity increase	% Benefit split between zones and species for each practice change area (% DSE's/AE's)
Profitable Grazing Systems (p00405)	Producer Adoption – Category C	Start: 2019/20 Peak: 2022/23	Units: Ha No.: 338,015	Business man.: $5.13 Feedbase: $20.20 Sheep repro. eff.: $17.93	Cost savings: 0% Productivity increase: 100%	Business man.: 45% sheep/55% Sth beef Feedbase: 45% sheep/55% Sth beef Sheep repro. eff.: 100% sheep
Producer Demonstration Sites (p00405)	Producer Adoption – Category C	Start: 2014/15 Peak: 2017/18	Units: Ha No.: 98,507	Feedbase: $10.37 Sheep repro. eff.: $0 Animal wellbeing: $0 Marketing: $2.12	Cost savings: 0% Productivity increase: 100%	Feedbase: 92% sheep/8% Sth beef Marketing: 100% Sth beef
EDGEnetwork – Northern (Business: p00138e Breeding: p00138f Nutrition: p00138g)	Producer Adoption – Category B	Start: 2020/21 Peak: 2023/24	Units: Ha No.: 20,108,849	Business man.: $0.65 Beef repro. eff.: $0.06 Feedbase: $0.58	Cost savings: 0% Productivity increase: 100%	Northern beef: 100% Sheep: <1%
EDGEnetwork – Southern (p00138d)	Producer Adoption – Category B	Start: 2020/21 Peak: 2023/24	Units: Ha No.: 390,652	Business man.: $5.81	Cost savings: 0% Productivity increase: 100%	Southern beef: 49% Sheep: 51%
Bredwell Fedwell Sheep (p00386d)	Producer Adoption – Category B	Start: 2019/20 Peak: 2023/24	Units: Ewe No.: 75,207	Sheep reproductive efficiency: $0.78	Cost savings: 0% Productivity increase: 100%	Sheep: 100%

Product Name/ Code	Category	Adoption start and peak year	Peak number and units adopted	Net Benefit by Practice Change Area*	% Benefit due to cost savings and productivity increase	% Benefit split between zones and species for each practice change area (% DSE's/AE's)
Bredwell Fedwell Southern Beef (p00386c)	Producer Adoption – Category B	Start: 2019/20 Peak: 2023/24	Units: Cow No.: 23,187	Beef reproductive efficiency: $3.08	Cost savings: 0% Productivity increase: 100%	Southern beef: 100%
BeefUp (p00567)	Producer Adoption – Category A	Start: 2021/22 Peak: 2023/24	Units: Head (cattle) No.: 145,606	Business man.: $2.84 Feedbase: $3.30 Beef repro. eff.: $3.22 Animal wellbeing: $1.35 Marketing: $2.60 Genetics: $2.34	Cost savings: 0% Productivity increase: 100%	Northern beef: 100%
MeatUp (p00637)	Producer Adoption – Category A	Start: 2021/22 Peak: 2023/24	Units: Head (cattle and ewes) No.: 112,747	Business man.: $1.46 Feedbase: $1.99 Beef repro. eff.: $6.95 Sheep repro. eff.: $0.45 Animal wellbeing: $0.69 Marketing: $2.22 Genetics: $5.06	Cost savings: 0% Productivity increase: 100%	Business man.: 49% sheep/24% Nth beef/27% Sth beef Feedbase: 43% sheep/57% Sth beef Beef repro. eff.: 100% Sth beef Sheep repro. eff.: 100% sheep Animal wellbeing: 37% sheep/63% Sth beef Marketing: 19% sheep/81% Sth beef Genetics: 100% Sth beef
Northern Australia Climate Program (p00443)	Climate Management	Start:2019/20 Peak: 2024/25	Units: Head (cattle) No.: 526,538	Business man.: $1.01	Cost savings: 26% Productivity increase/ reduced losses: 74%	Northern beef: 100%

Product Name/ Code	Category	Adoption start and peak year	Peak number and units adopted	Net Benefit by Practice Change Area*	% Benefit due to cost savings and productivity increase	% Benefit split between zones and species for each practice change area (% DSE's/AE's)
Lamb Survival/ Weaning Productivity Tools and Practices (p00517)	Sheep Reproduction	Start: 2016/17 Peak: 2019/20	Units: Ewe No.: 114,677	Sheep reproductive efficiency: $2.25	Cost savings: 0% Productivity increase: 100%	Sheep: 100%

* Aligned to producer adoption M&E Framework

Individual impact assessment reports for each of the products assessed have been provided as separate documents to this report, with the report for 'BeefUp' provided as an example in Appendix D.

4.3.3 Total Product Impacts

Table 3 presents the net benefit per unit of adoption, annual net benefits and net present values (NPV) for the 2015-2020 and 2020-21 impact assessments and combined totals for each product.

Table 3: Key impact assessment results by product for the 2015-2020 and 2020-2021 impact assessments[4]

Product Name/ Code	Annual Net Benefit Per Unit Adopted 2015-2020	Annual Net Benefit Per Unit Adopted 2020 - 2021	Net Annual Benefits[5] from 2015 - 2020	Net Annual Benefits[6] from 2020 - 2021	Total Net Annual Benefits as at FY 2022 (2015-2021)	Net Present Value of Benefits 2015 - 2020	Net Present Value of Benefits 2020 – 2021	Total Net Present Value of Benefits 2015-2021
Profitable Grazing Systems (p00405)	$17.47/ha	$18.15/ha	$8.9 M	$5.6 M	$14.4 M	$140.2 M	$85.2 M	$225.4 M
Producer Demonstration Sites (p00405)	$6.71/ha	$5.49/ha	$10.3 M	$0.5 M	$10.8 M	$161.6 M	$7.3 M	$168.8 M

[4] Base year 2025, 5% discount rate
[5] Based on adoption estimates for 2015-20
[6] Based on adoption estimates for 2020-21

Product Name/ Code	Annual Net Benefit Per Unit Adopted 2015-2020	Annual Net Benefit Per Unit Adopted 2020 - 2021	Net Annual Benefits[5] from 2015 - 2020	Net Annual Benefits[6] from 2020 - 2021	Total Net Annual Benefits as at FY 2022 (2015-2021)	Net Present Value of Benefits 2015 - 2020	Net Present Value of Benefits 2020 – 2021	Total Net Present Value of Benefits 2015-2021
EDGEnetwork (p00138)	$0.45/ha Nth $6.74/ha Sth	$0.46/ha Nth $5.81/ha Sth	$12.6 M	$10.9 M	$23.5 M	$184.2 M	$153.7 M	$337.9 M
Bredwell Fedwell (p00386)	$0.53/ewe $2.98/cow	$0.78/ewe $3.08/cow	$0.9 M	$0.1 M	$1.0 M	$15.5 M	$1.7 M	$17.2 M
BeefUp (p00567)	$1.19/Hd	$2.77/Hd	$1.8 M	$0.3 M	$2.1 M	$30.1 M	$5.1 M	$35.2 M
MeatUp (p00637)	N/A	$1.43/Hd (cattle and ewes)	N/A	$0.1 M	$0.1 M	N/A	$2.5 M	$2.5 M
It's Ewe Time (p00410)	$0.48/ewe	N/A	$0.4 M	N/A	$0.4 M	$5.7 M	N/A	$5.7 M
Northern Australia Climate Program (p00443)	N/A	$1.01/Hd		$0.3 M	$0.3 M	N/A	$6.7 M	$6.7 M
Lamb Survival/Weaning Productivity Tools and Practices (p00517)	N/A	$0.47/ewe	N/A	$0.0 M	$0.0 M	N/A	$3.4 M	$3.4 M
TOTAL			**$34.9 M**	**$17.8 M**	**$52.6 M**	**$537.2 M**	**$265.5 M**	**$802.8 M**

The results in Table 3 indicate that the vast majority of estimated benefits have come from investment in Category C products 'PGS' (28%) and 'PDS' (21%), and from 'EDGEnetwork' (42%, Category B).

In completing the impact assessment for this project, the following two key challenges were encountered:

1. **Existing M&E for products was incomplete or inadequate for the purposes of measuring impact, adoption and/or attribution for all products assessed**

   Producer impact data was only available for two of the products assessed ('PDS' and 'NACP'), actual adoption data (as opposed to intent to adopt data) was only available for one product ('PGS'), with partial data available for 'PDS', and attribution data was not available for any of the products assessed. As a result, estimates were used to fill these gaps either from producer data from previous impact assessments of the same or a similar product, or author estimates were made where no comparable data was available.

   In addition, the consistency in data collection and collation was generally low. These issues are discussed further in section 4.1.1 and Appendix E of this report.

2. **Non-producer participants in adoption products are not represented in M&E**

   Current M&E plans for most of the current adoption products do not involve estimating impact or adoption for non-producer participants, such as livestock advisors, agribusiness professionals (agronomists, rural banking representatives, stock agents, rural merchandisers etc), financial counsellors, government extension staff, researchers etc. This gap has been identified along with suggestions to address the issue as part of development of the M&E Framework for this project. Trialling of different approaches to collection of data from this non-producer audience will be required in order to identify the most effective methods and questions to ask in order for meaningful data to be collected.

5.0 Discussion

5.1 Impact Assessment

As noted previously, the vast majority of total on-farm net benefits have come from investment in 'PGS', 'PDS' and 'EDGEnetwork' (Table 3).

Across all products, the type of practice changes that typically return the highest net benefits to producers over time relate to feedbase changes (Table 2). Around 80% of the hectares impacted by practice change adoption from the 'PGS' product related to feedbase improvements, thus the relatively high net benefit per hectare from this product.

In addition to the estimated net benefit per unit of adoption, the rate of adoption also drives the total NPV for a product. Adoption rates for Category C products, such as 'PGS', are typically much higher than those for Category A and B products. For example, the average adoption rate for 'BeefUp' (Category A) and 'BWFW' (Category B) is around 40%, compared to around 70% for 'PGS' and 'PDS' (core producers).

'PDS' projects vary in the topics addressed by the demonstration sites, however over half of the 'PDS' projects assessed since 2015 (54%) have related to feedbase demonstrations. 'PDS' projects also tend to result in relatively high adoption rates among core producers (much lower among observers). In

comparing the 'PDS' NPV for 2015-2020 investment to 2020-21 investment, 22 projects were included in 2015-2020 compared to only four in 2020-21, two of which provided no benefit, thus the much lower NPV for 2020-21.

The majority of benefits from investment in the 'EDGEnetwork' product came from northern EDGE (88%) as opposed to southern EDGE (12%) extension activities. The adoption rate for northern 'EDGEnetwork' was relatively high for the 2015-2020 assessment period (74%), with an average participant property size of approximately 90,550 hectares. The northern 'EDGEnetwork' adoption rate for 2020-21 was lower at 51%, however average property size of participants was considerably larger at approximately 209,000 hectares.

In comparing the relative reported benefits from the products reviewed in Table 3, it is important to be aware that these benefits are estimates based on a very small sample of producer case studies relative to the number of producers making practice changes. These case studies will therefore not represent all of the types of changes producers are making, and may or may not represent the typical benefits being received for a given type of case study practice change for all producers making the same type of change. These and other limitations associated with these estimates are discussed in further detail in the following section.

5.1.1 Limitations and Uncertainties

There are various limitations and uncertainties associated with the estimates of impact and adoption for the products evaluated for this impact assessment. The following range of uncertainties and limitations has been identified:

- Uncertainty regarding the transfer of trial results to producer impacts on farm.
- Uncertainty regarding the actual level of producer adoption occurring relative to producer stated intentions to adopt.
- Uncertainty regarding the degree to which previous producer survey results, including case study scenarios, are likely to represent producers for the current assessment period.
- Uncertainty regarding future producer capacity to continue receiving expected benefits due to unknown seasonal/climate change impacts and personal situations e.g. retirement, selling the business, enterprise changes.
- Limitations associated with making estimates of impact/adoption where little empirical and/or intent to adopt data exists.
- Limitations associated with a lack of data available for some elements of potential benefit associated with product adoption. In these situations, only part of the full potential benefit was able to be assessed. For example, impact of changes to ram/bull buying behaviour was unable to be assessed for 'BredWell FedWell'.

Efforts have been made to address key limitations and areas of uncertainty wherever possible by taking a conservative approach to making estimates of both impact and adoption and by conducting a sensitivity analysis around the key risks associated with measurement of product impact.

5.2 Assessment of products against the M&E Framework

The assessment of MLA's extension products for their current ability to generate the data necessary to enable on-farm economic impact to be calculated revealed a number of common factors that need to be addressed. These are described below.

5.2.1 Project objectives do not specify the collection of data required to measure economic impact

Project objectives generally focus on achieving delivery of the product activities rather than on achieving the overarching outcome of the product. The difference is subtle but important, as measuring success against contracted project objectives involves metrics related to delivery (participation) targets and delivery of activities, whereas measuring the product outcome is focused on what the delivery is going to achieve, such as achieving a certain level of producer adoption, achieving a percentage improvement in productivity KPIs or an improvement in profitability.

This explains why current project M&E does not, in many cases, collect enough data to report on adoption and impact of the product, but instead contains a lot of data on activities completed and participation rates as measures of success. The majority of contracts are thus focused on achieving delivery targets with little way of determining if the product actually delivered the practice change and impact intended or achieved any practice change or impact at all.

In the case of a number of products, what the delivery was supposed to achieve as an outcome (i.e. what change is expected and what impact that will have) is not specified, or was developed a long time ago and has been lost as MLA project staff have moved on and corporate knowledge lost (e.g. 'EDGEnetwork', 'PGS'). It is suggested that MLA review the purpose/intended outcomes for all extension products to enable the identification of the adoption and impact targets that best fit the product, and that contracts be reviewed to include this as part of project objectives which then align with M&E data collection and reporting for measuring success against those objectives.

5.2.2 Measurement of attribution is poorly understood and is not included in most M&E plans

Only 3 of the 16 products assessed against the M&E Framework scored above a 0 for assessing attribution. This is because for most products, it is an aspect of evaluation that is novel and/or may have been considered problematic to include in the past. For products to be able to collect attribution data in the future there will need to be information and training around this concept to enable people to understand how it can be measured and how to interpret the data.

5.2.3 Data management, analysis and reporting is variable

There were considerable challenges in accessing and utilising existing data collected for monitoring and evaluation purposes. Analysis of existing data sets showed that although projects have plans that seem to align with the requirements for monitoring and evaluation of impact, the implementation of

these plans is inconsistent and produces variable results when it comes to accessing and utilising the data.

Monitoring and evaluation requires three types of data to calculate economic impact:

1. Participation i.e. # participants, # businesses they represent, # ha/business and #livestock (cattle, sheep)/business)
2. Adoption & attribution i.e. what proportion of businesses made a change as a result of participation and how did participation influence that change.
3. Impact i.e. what $ impact did the change have on the business and over what time frame.

Figure 1 provides a summary of the evaluation requirements for extensions programs.

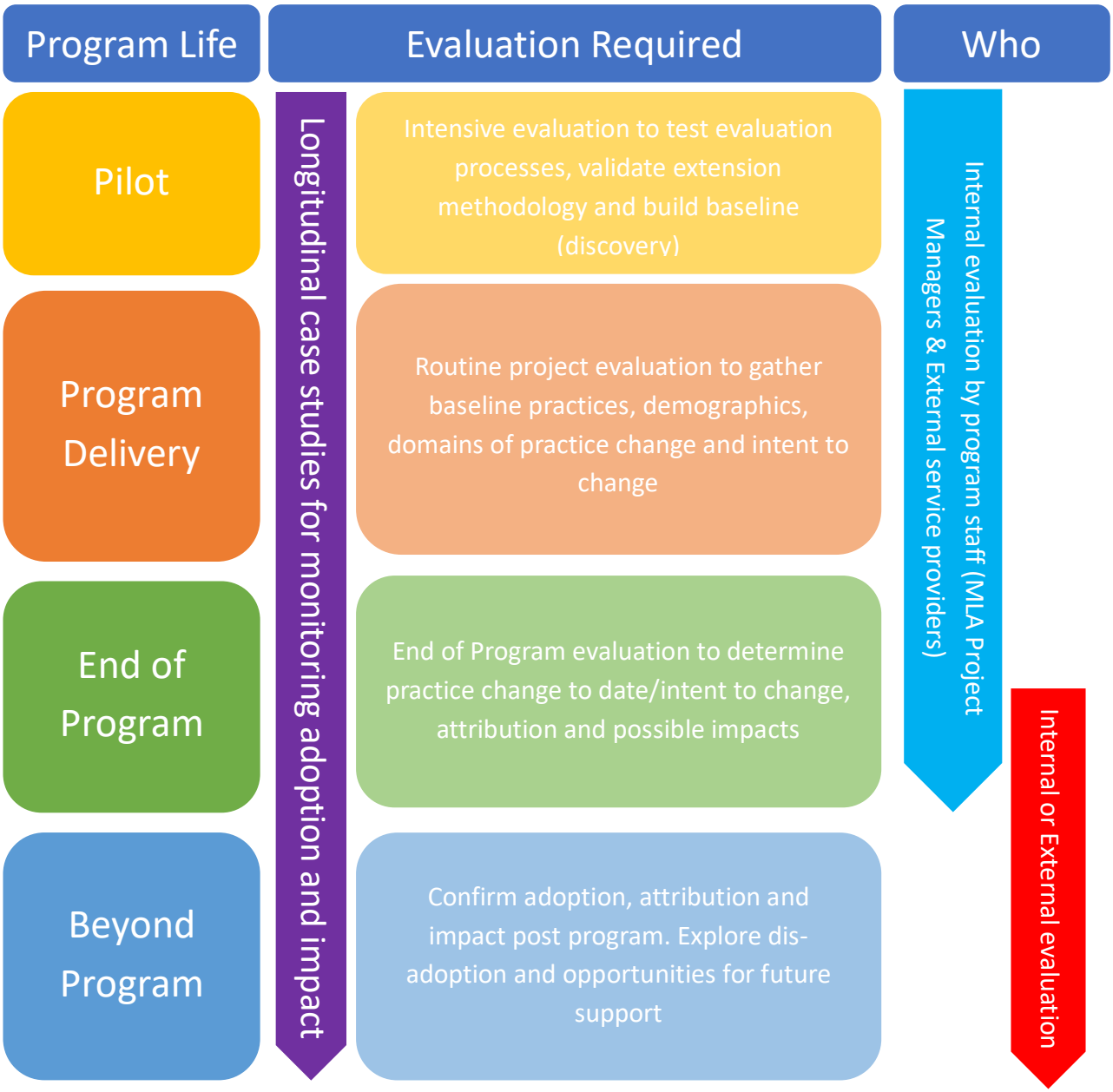

Figure 1: Model of extension program evaluation requirements

While it was expected that availability of ideal adoption, attribution, and impact data would be beyond the scope of most current extension project M&E plans and budgets, it was surprising how much collation, clean up and reanalysis of the data from participation and event evaluations was required to enable calculation of simple figures such as number of businesses, total ha and total number of head.

In general, it was observed that raw M&E data analysis often does not occur until the end of the project or prior to a reporting period. This was evident with most projects providing an Excel spreadsheet of raw data that showed little analysis or interpretation or commentary on figures collected. Some had commentary and analysis in the final reports but often it was not in a form that was useful for this analysis i.e. was commentary about the delivery of the program rather than adoption or impact.

Data storage and collation are an aspect of M&E that also needs to be addressed. While it is acknowledged that there are privacy issues surrounding how data is stored, it is important to identify solutions so that data from pre-event registration can be linked to data collected during the event/project and to data collected as part of the follow up process. This includes being able to identify participants from the same business so that demographic data is not double counted, through to being able to follow the pathway from current practice to intention to change to actual change and the impact this has had on an individual business. Some projects have started to utilise MLA's CRM to record registration data for events. It is worth considering if this platform would enable additional data to be recorded against each individual (perhaps linked to MLA member number and MyMLA) across multiple projects.

Another issue around data management is collation of information from multiple events/touch points within a project. Often M&E is recorded and analysed per event/interaction to show statistics but not collated across all events and interactions to show overall product statistics. For example, 'Livestock Advisor Updates' has a summary per webinar of participation but data is not collated across all webinars. 'PDS' projects report information per project but only demographics are collated for the whole of 'PDS', not adoption and impact data. It is suggested that mechanisms to enable whole of product data collation be developed to create efficiencies in reporting of key M&E figures for MLA's internal quarterly reporting, and soon to be annual impact reporting.

Further detailed observations on the limitations of existing data sets are provided in Appendix E.

5.2.4 Evaluation capacity and capability

It was evident during the assessment process and calculation of economic impact activities that in general, there were few products that had the extension evaluation capacity and capability to measure economic impact. This was more evident in older projects/products. Conversations with project staff while gathering data also highlighted that all projects/products would benefit from assistance and most could also benefit from additional resourcing to enable impact evaluation to be factored into existing evaluation plans. Only two products ('T90' and 'NB2') have all the processes and resources in place to deliver economic impact data, but even they will require on-going support to

ensure that the evaluation data gathered meets needs and that personnel can implement M&E processes.

5.3 Implementing (transitioning to) new M&E processes

5.3.1 Change management versus transition management

This project has involved developing an M&E Framework for data collection to support measuring on-farm impact and attributable adoption from MLA extension activities. In this context, it can be thought of as building a framework that drives and embeds improved M&E across MLA's adoption program (change management). However, it is crucial to take into consideration the effects that this change will have on the people that are required to implement the new framework (transition management).

What has become evident during the assessment of MLA's adoption products is that various MLA project/program managers also require support more broadly for M&E implementation across products, such as deciding what KASA data collection is warranted, how to design feedback forms and what exact questions to ask. Also, program coordinators want to know how they will convince deliverers and participants to complete evaluations and how to integrate evaluation into program delivery in a useful way, including developing templates and processes for their specific projects, as some are currently unsure how to or are unwilling to do this for their projects.

It is suggested that HOW the transition to the new M&E Framework is managed (culture and communication) will be important in order to successfully support the implementation process.

5.3.2 Managing transition to the new M&E Framework

MLA project managers and external service providers engaged during this project identified that in some cases, the M&E processes they are currently using are inadequate and not meeting their reporting and continuous improvement needs, but are unsure/unable to improve them because they do not have the resources and/or the capability to make improvements. There is also uncertainty about the value in making changes to M&E (scepticism about 'who uses it anyway') or how to influence the people who implement the evaluation methods to adopt the new processes.

The following observations are made about the environment in which the new adoption M&E Framework will be implemented:

1. **There is a lot of confusion about data collection and reporting versus data collection, collation, analysis, and interpretation** - the latter is not happening in most projects. There are few project managers that understand how to interpret and use the data collected to support assessing the progress of their extension efforts or problem solve when the project is not achieving the outcomes expected. This is a gap that MLA needs to consider in terms of how to develop the practice of continuous improvement of program methodology using the information collected from the participants and deliverers.

2. **There is an expectation that the new adoption M&E Framework will address all aspects of evaluation** i.e. not just how to measure on-farm economic impacts but also how to evaluate effectiveness of extension (e.g. is it meeting all the aims of the project and is the best method for delivering the desired change being used). While it is clear that the M&E Framework does not cover aspects of evaluation such as participant satisfaction, KASA change and delivery against milestones etc, there is an unconscious expectation that this will be addressed. In engaging with stakeholders, when it was made clear that this aspect of evaluation is not covered by the Framework, the feedback was around asking when this aspect will be addressed.

3. **There is cynicism among program coordinators and deliverers regarding evaluation in general** and preconceptions of what is achievable and what is not based on negative past experiences, inexperience in evaluation and discomfort around collection of farm data from participants, including financial data. Sentiments amongst project staff included those with little experience wanting to learn how to do it properly but being frustrated at lack of help and direction. For those who have been around awhile, they have grown weary of evaluations that measure a lot but report nothing useful back to them, or are wary of claims of adoption/impact as they doubt the integrity of the data collection and interpretation as they have first-hand experience of the limitations of the data gathered.

4. **There is cynicism regarding the Framework becoming another good idea that was not resourced to allow it to be effectively implemented**. Past experience for many people involved in 'PGS' for example, shows that while a complex evaluation process was designed that was supposed to deliver on impact, implementation of the process was lacking and the commitment of many personnel to the process has declined because they have not seen how the information is being utilised, reported and fed back. In fairness, this is justified as the data has not been able to be utilised in any meaningful way that improves the participant or deliverer experience.

5. **There is a general need for a more detailed understanding of and experience in extension program evaluation in the current cohort of program and project managers**. This includes understanding of evaluation theory and models through to designing evaluation tools, data management, interpretation and reporting. There is little opportunity for building evaluation capability in current budgets as most project contracts are written to achieve delivery of the extension product (e.g. achievement of a set number of workshops/participation), rather than to achieve the overarching outcome of the product (e.g. did the participants make the desired practice changes and did these have a positive impact at a large enough scale to achieve industry level outcomes).

6. **There is a need for a discussion around what adoption is desirable versus what is achievable, and who the target audience is.** There is an underlying initial assumption that the outcome of all products is adoption of new/improved practices and technology that will have a positive impact on productivity and hence profitability. There are also high expectations of what level of adoption equates to success and failure of a program and an underlying assumption that most producers attending events come with a desire to make this change in their businesses. While it is understood that not all producers do make change as a result of engagement in an MLA extension product, there is little acknowledgement in any product of who the target audience is in terms of

characteristics and demographics and if the product actually engaged it's intended audience. It is therefore a flawed assumption that the majority of participants are there to takeaway information to make change when no analysis is made of who the audience actually represents.

Until the discussion is had as to what level of adoption from a project is deemed enough for 'success' and what is achievable given the target audience that engaged in a project, project personnel will continue to be cynical and sceptical of evaluation of impact as a means of demonstrating project success as they will be fearful that impact measures will determine investment. For instance, what happens to a project that achieves its engagement and satisfaction targets but does not result in a large adoption and economic impact? Does it mean it is deemed a 'bad investment' and does not receive continued funding, or are other factors going to be considered in the investment decision rather than just benefit:cost? Discussion of how the measure of economic impact is going to impact on investment in extension projects/products into the future needs to be had with all personnel involved in management and delivery of MLA extension projects to assure them of its valid uses and how it benefits them.

7. **Evaluation data is collected from participants by deliverers, but the results are not fed back to participants or deliverers.** This means there is little understanding about how the data is used by MLA or the value of providing accurate data. Most participants and deliverers see evaluation as a data collection exercise that has little relevance to them personally, so are not invested in providing accurate data. Showing producers and event organisers/deliverers how the data is used is an important step that is missing from current evaluation processes.

5.3.3 M&E data management and reporting annual timeline

Development of a clear timeline for collation, analysis and reporting of M&E data for adoption products would also assist to support implementation of the M&E Framework. The annual reporting process would need to identify what data management actions are required at what times of the year and who is responsible for those actions. A suggested annual timeline based on a calendar year, with data collation commencing in January and reporting in June, is provided in Figure 2.

Figure 2: Proposed M&E annual reporting system

Figure 2 refers to an MLA M&E Data Manager, which is a recommendation from this project as a new resource required to effectively implement the M&E Framework. This resource would largely replace much of the evaluation tasks currently outsourced to external service providers, however external service providers will still be required for some aspects of the evaluation process as an independent source of data validation and assessment. This recommendation, along with a series of other recommendations to support improvement of M&E processes and implementation of the new M&E Framework are provided in the following section.

6.0 Recommendations

Five key recommendations have been made to support the improvement of M&E processes and transitioning to the new adoption M&E Framework:

1. A review of all ongoing adoption product and related project aims, objectives and outcomes to ensure that they include adoption and impact targets and measures, and their M&E plans are in alignment with the new adoption M&E Framework.
2. Include contractual requirements for all new extension products to ensure that product M&E processes align with the new M&E Framework.
3. A review of current evaluation methodologies utilised to capture data and development of standard methods/templates and data storage systems to ensure data is captured and stored appropriately for each product.
4. Development and support of extension M&E capability and capacity in personnel overseeing evaluation within products/projects.
5. Appointment of an MLA M&E data manager to oversee the implementation of the adoption M&E Framework in addition to implementation of recommendations 1- 4 above.

Recommendations in Detail

Recommendation 1: Review all ongoing extension products and their subsidiary project aims, objectives and outcomes to ensure they include adoption and impact targets and measures, and their M&E plans are in alignment with the new adoption M&E Framework.

As mentioned in the discussion, many delivery contracts for projects within an extension product are written with aims, objectives and outcomes that specifically align to achieving delivery targets, but not necessarily the overarching product outcomes for adoption and impact. As a result, the M&E plans tend to focus more on achieving participation, satisfaction and KASA targets rather than adoption or impact targets and outcomes. To enable the resources to be appropriately allocated to evaluation of adoption and impact, MLA needs to ensure that each extension project aligns to the overall product outcomes to ensure that the project evaluation delivers the data required for assessing impact. This will mean that many of MLA's products will need to review and update their aims, objectives and outcomes to align with MLA's requirements for measuring adoption and impact.

Recommendation 1.1: That a review of 'PGS', 'PDS', 'EDGEnetwork', 'BWFW', 'BeefUp' and 'MeatUp' be undertaken as a priority as they are MLA's flagship extension products with the highest profile and potential reach. All of these products currently have imperfectly aligned delivery contracts to product outcomes.

> For example: Redesign objectives/deliverables for 'BWFW' Sheep with clear adoption outcomes that reflect desired practice changes. An example 'BWFW' Sheep outcome could be 'to achieve a 10% improvement in lamb survival in 3 years by adoption of pregnancy scanning, condition scoring ewes, reduced mob size for lambing and splitting mobs into singles and twins and feeding ewes according to condition score targets'. This outcome makes it very clear what needs to be evaluated to meet the target and measure impact.

***Recommendation 1.2*:** That all new or recently commenced extension products (e.g. 'BestWool'/'BestLamb'/'BetterBeef', 'ParaBoss') go through a process that maps the pathway to adoption and clearly states the aims, objectives and outcomes in ways that enable adoption and impact targets to be embedded in project deliverables.

Recommendation 1.3: That products that aim to deliver benefits to non-producers through capability building (e.g. 'Livestock Advisor Updates'/'Livestock Advisor Essentials') have their pathway to adoption mapped and aims, objectives and outcomes reviewed to determine if they are able to measure adoption and impact using the M&E Framework.

Recommendation 2: Include contractual requirements for all new extension products to ensure that product M&E processes align with the new M&E Framework.

Contractual requirements should include the following:

- Development of an M&E plan, conforming to the M&E Framework and approved by MLA
- Inclusion of appropriate and agreed target adoption/impact KPIs
- Collection of baseline and demographic data at the beginning of delivery
- On-going adoption/impact data collection (including post project if required)
- Appropriate funding and other resources for achieving the above

Recommendation 3: Review current evaluation methodologies utilised to capture data and development of standard methods/templates and data storage systems to ensure data is captured and stored appropriately for each product.

As stated in the discussion, project coordinators and managers are seeking advice, support and new ideas to enable them to meet their obligations to collect, analyse and report evaluation data to MLA. In particular, they would value the development of standard methods, templates, data storage and reporting templates and systems to streamline project evaluation. This also requires training and support to use the templates and a feedback process that ensures that data is standardised and reported accurately by feeding back issues and anomalies so that they can be rectified before being used by MLA.

All training should be practical and interactive i.e. how to use the templates and have participants complete them as they go. It will need to be tailor made for the audience and would need to include a needs analysis up front to determine content and processes before the exact type of training and content is determined. It would also need to include a mentoring/coaching component after the training to ensure that people have access to assistance as required for implementation when they 'get stuck'. Ideally, training would be developed and run by the new MLA M&E data manager with input from external expertise as required, or alternatively could be contracted externally to design and deliver in the interim. A needs analysis would be the first step with two cohort groups – MLA program managers as one and project M&E staff as another.

Part of this review would also allow for pilot testing of new processes to test the applicability to different types of extension products, such as whether it is feasible to measure impact for non-

producers, and whether cross program case studies can be used to monitor and measure adoption, attribution and impact for producers that have participated in multiple MLA products.

Recommendation 3.1: Gather and review all existing data collection templates and methods, data storage and reporting tools/methods using the product assessments against the M&E Framework (Milestone 3) as the starting point.

***Recommendation 3.2*:** Design and pilot new templates and processes for data collection, collation and storage as required.

This needs to include:

- Pre-event registration process that all projects can access that captures demographics as well as relevant baseline practices that can be tailored to each type of event. This also needs to be able to clearly identify participants from the same business. The MLA CRM may be appropriate for this process provided it can link participant registration to evaluation data from the event so that participant responses can be linked to contact details for further follow up. This system would also need to allow for participants from feeder activities such as 'BeefUp' etc to be linked to participation in other MLA extension products such as 'PGS','PDS', 'EDGEnetwork' etc.

- Build evaluation into the event that allows it to add value rather than as an 'add on'. For instance, using the 'PGS' Lifting Lamb Survival example, collect figures on day 1 as baseline, then collect again on the last day as part of the workshop review and make the offer to update the data the following year as part of an incentive to stay connected (e.g. free lambing analysis for participants who provide data the following year when prompted by deliverer).

- Re-designing KASA[7] evaluation questions to actually measure indicators of likely adoption. Currently KASA evaluation questions are primarily designed to test participants knowledge of a topic and capture some evidence of use of new skills, with less focus on measuring attitudes to making change. A more useful KASA would be asking participants if they currently used the practices targeted by the extension activity already and whether they intended to after, if they thought they had enough skills and knowledge to make change and mostly if they wanted to make change or were able to make change. This information could then be used to target participants for follow up after the event to see if change happened among those that indicated they were most likely to change and to see if they changed their mind if they said they were not going to make change.

Recommendation 3.3: Develop and implement evaluation processes that evaluate effectiveness of the product/project so that it better delivers on its objectives and outcomes.

For example:

- Use the participant registration data to develop a deeper understanding of 'who is engaged' and determine if they are the intended target the product/project was designed

[7] KASA = Knowledge, Aspirations, Skills and Attitudes as defined in Bennett's Hierarchy of Evaluation in Bennett, C. (1975) Up the Hierarchy. Journal of Extension (March / April), 6-12. Having the right KASA is considered the step prior to practice change but is an assumption not proven cause of practice change.

to attract. Consider using it also to discover who is not coming to events by comparing to the MLA member database to determine who is benefiting from MLA programs and who is not.

- Use evaluation processes that assist adoption. This is often overlooked in the design of extension programs/projects. To ask the question 'how do you intend to use the information/skills learnt' prompts thinking that leads to reflection and planning on how to implement new ideas. 'Coaching' research has shown that if someone knows they will be followed up within a space of time, that a proportion will use this as motivation to actually implement the change they were contemplating. This suggests that asking participants what changes they intend to make and then holding them accountable with a promise of a follow up phone call (which is part of the post program evaluation) can result in some participants actually being more motivated and more likely to make the change. Similarly, reviewing evaluation data regularly with the delivery team can uncover and discover ways of improving the program that can lead to increased adoption. In the current funding environment, not enough emphasis is given to considering the value add of evaluation to programs, instead it is simply perceived as a reporting requirement only that comes as an additional cost with little value attached to it.

- Use intensive evaluation at the beginning of the life of the project in pilot stage to check that the methodology works and the outcomes are able to be achieved (discovery processes) and less intensive evaluation as the project continues and a body of evidence accumulates over time that supports the intended outcomes (validation processes).

***Recommendation 3.4*:** Develop an on-going longitudinal case study project that follows a selection of producers that have participated in one to multiple MLA extension products over 5 years or more to fully explore adoption, attribution and impacts in a variety of seasons/locations/enterprise mixes.

Currently there are no on-going longitudinal studies of participants to assess how they are utilising the information, knowledge, skills gained from participation in MLA extension products. Because there are no such studies, any impact/adoption data needed for evaluation and reporting has to be sought from project archives and from other sources to satisfy this need. If MLA had a longitudinal study project sitting apart from the MLA extension products, it would enable each product to access valid adoption and impact data across a range of practice change areas and regions when required, and also enable the effect/impact of participation in multiple products to be explored.

The number of producers involved would be determined by a statistician based on participation overall and spread of demographics e.g. geography, enterprise mix and types of changes participants are making. It is estimated that this would be in the order of 50-100 at a minimum as a starting point. Producer engagement would involve annual collection of production and profitability data (as per benchmarking surveys) plus an interview to identify what changes have been made, what the challenges have been, who they are seeking advice from, and participation in MLA programs. The process would also need to include a feedback meeting where participants review the data collected and are provided with assistance to interpret what it means for their business as an incentive to keep

participating as a case study. Another option to encourage ongoing participation as case study businesses would be to consider paying participants to provide the annual information required.

Recommendation 4: Development and support of extension M&E capability and capacity in personnel overseeing evaluation within products/projects.

For example, there is currently little understanding of 'attribution' amongst MLA project managers and external coordinators. Nearly all the products evaluated did not ask participants in follow up activities if their participation in the event/project contributed to change as the sole cause, partial cause, trigger or it would have happened anyway. Understanding this is important to determine how valuable a particular event/project is in the spectrum of change, and to show where projects can be improved to support participants to make change. The extension project managers and coordinators consulted during this project expressed a desire to better understand evaluation theory and application. MLA would be well placed to meet this need and it would be a value add rather than an added expense to invest in the capability and capacity of extension program staff as well as the external project managers and coordinators contracted to deliver projects.

Recommendation 4.1: Conduct an audit of extension evaluation capability within existing contracted and internal personnel with evaluation responsibilities.

This audit would ideally be conducted by the new MLA M&E data manager as part of a general needs analysis for evaluation capability/capacity. The first step for the M&E data manager would be to do this as well as the review of all product aims/objectives/outcomes. Based on the findings from these two activities, a plan could be developed of what needs to be done with different budget options depending on who delivers the required training and mentoring and how it is delivered.

Recommendation 4.2**:** Design and implement an evaluation capability building process that aims to ensure MLA evaluation requirements are able to be met by project staff into the future. This could incorporate formal training as well as coaching/mentoring for on-going support.

As noted above, the people who require training and the type of training required will need to be determined via a formal audit/needs analysis of existing capability.

Recommendation 4.3**:** Evaluate and continuously improve the capability building process of MLA project/program managers and project M&E staff to ensure that it delivers on both MLA needs and individual personnel needs.

Recommendation 4.4: Ensure that sufficient financial resources are available at the project level to undertake the data collection, collation and analysis required for alignment with the M&E Framework.

Estimated budgets were provided for any recommended additional data collection and management activities for the extension products assessed against the M&E Framework. This information is provided in the individual product reports accompanying this final report.

Recommendation 5: Appoint an MLA M&E data manager to oversee the implementation of the adoption M&E Framework in addition to implementation of recommendations 1-4 above.

It is evident from the findings of this project and previous product evaluations undertaken by external consultants that MLA does not have the internal capability or capacity to oversee and ensure extension product evaluation is able to meet MLA's current needs. While external evaluation will still be required periodically to validate/audit internally generated evaluation data, MLA could lessen the need for external evaluation support if it appointed an extension evaluation expert to oversee the implementation of the adoption M&E Framework in addition to the other recommendations from this project.

The role would require experience in extension design and delivery (practical experience) in addition to a practical understanding of evaluation processes and requirements. The incumbent may require some level of training/mentoring using external expertise initially to support implementation of the M&E Framework. It is suggested that the role would need to be on a full-time basis, at least initially during implementation of the M&E Framework, to provide a readily accessible resource for MLA staff and extension service providers. The role may be able to reduce with time as capability, tools and processes become embedded in the annual evaluation cycle.

The proposed duties and areas of responsibility for the M&E manager require detailed scoping and should include:

- Review of the aims and intended outcomes of all ongoing extension products/projects to ensure that they include measurement of adoption and impact as well as participant and delivery goals.
- Complete a systematic annual review of all ongoing on farm extension products with commercial and/or adoption pathways to assess alignment with the M&E Framework and to work with project managers to make any changes to improve alignment as required.
- Review of all current MLA evaluation requirements i.e. review the need for KASA measures as well as how KASA is captured, reported and interpreted, review how the M&E plans link to program delivery to add value to continuous improvement and provide insights to how programs can be improved.
- Training and supporting (mentoring/coaching) of extension product/project managers and coordinators to better understand how evaluation can add value to their extension products/projects and demonstrate evidence of achievement of aims and outcomes. This includes how to collect, manage, interpret and report evaluation figures and how to calculate the relevant project KPIs in a standard way.
- Training and supporting (mentoring/coaching) of evaluation personnel in how to design evaluation processes so that they add value to the extension activity and do not result in additional meaningless processes. For example, the 'PGS' SLP Lifting Lamb Survival has a process at the commencement of the program where group members bring their past lambing data to the event and the deliverer inputs this data into a spreadsheet to calculate their lamb survival/ewe survival figures for discussion and to help direct participants to areas they can improve. This is the type of data that is needed as a baseline to measure adoption/impact against, but for some reason it is not captured by 'PGS' as baseline data. It is also not referred to in any 'PGS' evaluation processes and was only discovered when discussing statement of

impact with a deliverer of the SLP during this project. It would be interesting to know for all extension activities, what other baseline data is being informally collected by deliverers to help tailor delivery and whether this can be captured for evaluation purposes.

- Collation of annual impact and adoption data and calculation of annual impact.
- Implementing the longitudinal case study process across products if this is undertaken.

7.0 Conclusion

This project has delivered an adoption M&E Framework to support improved data collection that will enable more accurate assessment of MLA return on investment in extension products, and will also support the ability of MLA to conduct more evaluation in-house. An assessment of existing MLA extension products against the Framework revealed a range of gaps in current M&E plans and processes, with recommendations provided for addressing those gaps for each product.

Successful implementation of the M&E Framework will require careful planning, communication and resourcing. Concerns of service providers who are delivering extension programs will need to be addressed and appropriate resourcing provided to ensure that effective and accurate data collection is achieved without placing additional burdens on deliverers. Tools and techniques for effective data collection, collation and storage will need to be identified and implemented within the various delivery models for extension projects. Successful transition to use of the new M&E Framework will also require MLA to invest in the development of both internal and external evaluation capability and capacity within existing product/project personnel. A series of recommendations have been made to help support implementation of the Framework in these areas.

The impact assessment of relevant extension products has revealed a range of likely levels of product impact and adoption over the assessment period. Total cumulative NPV of net on-farm benefits from investment in the extension products reviewed between 2015 and 2021 is estimated at $802.8 million, with the vast majority of benefits coming from investment in Category C products ‘PGS’ (28%) and ‘PDS’ (21%), and ‘EDGEnetwork’ (42%, Category B). The total annual net benefit at financial year 2022 was estimated at $52.6 million.

Across all products, the type of practice changes that typically return the highest net benefits per unit of adoption to producers over time relate to feedbase changes. In addition to the estimated net benefit per unit of adoption, the rate of adoption also drives the total NPV for a product. Adoption rates for Category C products, such as PGS, are typically much higher than those for Category A and B products.

The assessment process has highlighted key areas where MLA can implement improved data management processes to assist with more accurate impact assessments of this kind in the future.

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9.0 Appendix A –Adoption M&E Data Collection Framework

Purpose

The purpose of this framework is to assist with identifying data collection requirements for measuring attributable adoption and on farm economic impact resulting from MLA investment in producer extension programs, or those R&D projects that contain a significant extension component and where producer adoption is a project objective.

This framework does not apply for projects where the objective is to develop and test tools/enablers such as decision support tools or the development of extension materials. Furthermore, this framework also does not apply to projects aimed at raising awareness and/or increasing producer/advisor skills and knowledge on a topic without a specific objective of achieving significant practice change adoption and resulting economic impacts among participants.

The framework does not assist with measuring the effectiveness of an extension program in engaging the target audience and delivering on program objectives. To measure program effectiveness, additional data collection is required that is separate from the data collection identified in this framework (e.g. engagement of target audience, participant satisfaction/enjoyment, changes in participant KASA, deliverer effectiveness).

The framework assumes that each extension project has identified practice change areas (with their relevant production and profitability KPIs) that the project aims to improve among participants. In some cases, it may not be realistic or achievable to collect the required data for measuring performance against these KPIs from every participant. An alternative is to collect data from a sample of participants, to develop practice change case studies using a small number of participants, or to use non-participant sources of data for some variables, including industry survey data (e.g. ABS, ABARES, MLA sheep/beef survey), farm benchmarking data (e.g. Livestock Farm Monitor Project), available research data or modelling tools such as AusFarm or APSIM.

Further information regarding the purpose of monitoring and evaluation and the development of monitoring and evaluation plans can be found in the MLA document titled: 'Custom Monitoring and Evaluation Framework'. This document is available from MLA project managers.

Overview of the Framework

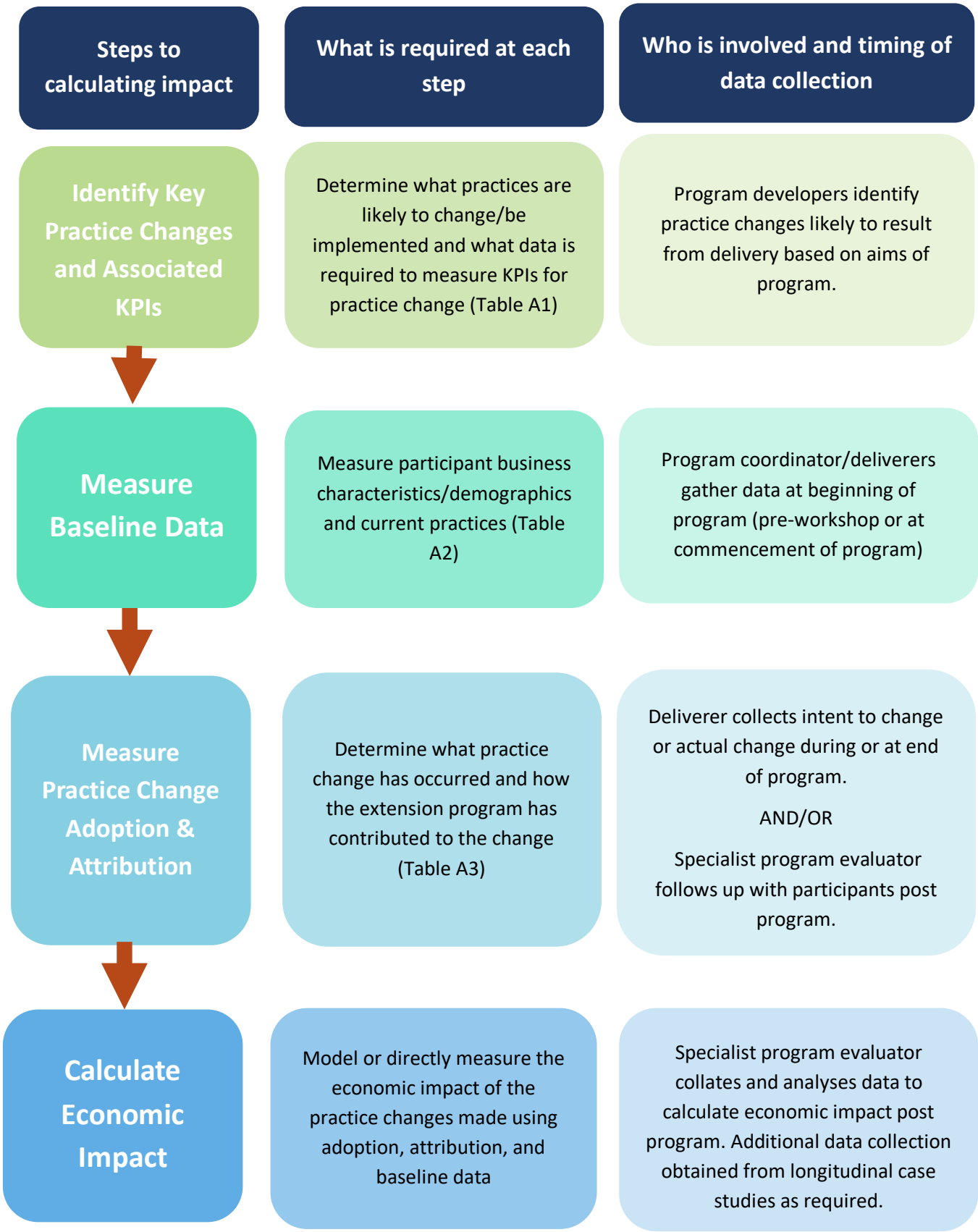
The Framework consists of four components:

1. Identification of key practice change area/s and related productivity and economic KPIs that need to be measured to assess impact, along with associated data requirements (Table A1).
2. Collection of baseline data from participants (Table A2).
3. Measurement of adoption and attribution of practice changes made by participants (Table A3).
4. Guidelines for who collects the data, when, how often and using what methods (Table A4).

Appendix A1 provides an example of how the framework is applied to an extension project, Appendix A2 provides an example of an impact M&E plan which is aligned to the M&E Framework, Appendix A3 details the relationship between current MLA extension related products and their key practice change areas and Appendix A4 outlines suggestions for how data collection can be built into delivery of extension projects.

Figure A1 details the flow of information from identification of practice change KPIs to calculation of program impact.

Figure A1: Steps to calculating extension product economic impact



Framework Components

1. Identify Measures of Economic Impact

The first step in assessing the impact of an extension project/program is to identify the most likely practice changes that will be adopted by participants (begin with the end in mind). Table A1 assists project/program leaders to identify the key practice change area/s and related productivity and economic KPIs that will need to be measured to assess project/program impact. The table then identifies what data is required to measure success against these KPIs. The practice change areas identified in Table A1 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 A1: 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
		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.		

Practice Change Area	Practice Change Types	Productivity KPIs	Data Required to Measure Productivity KPIs	Economic Impact KPIs	Data Required to Measure Economic Impact KPIs
		Ewe mortality (%)	- Total number of ewes joined - Annual number of ewes deaths between joining and weaning/total annual ewe deaths.		change e.g. pregnancy scanning, labour, supplements/fodder.
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		
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,
		Kg/hd/day	- Start and end weight/hd (kg LW) - No. days between start and end weighings.		

Practice Change Area	Practice Change Types	Productivity KPIs	Data Required to Measure Productivity KPIs	Economic Impact KPIs	Data Required to Measure Economic Impact KPIs
		Kg/hd	- Average turnoff weight per head (kg LW or DW)		capital cost of new equipment/technology. - Additional annual ongoing utilisation costs associated with the practice change e.g. fertiliser, labour, chemicals.
		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)		
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
		Product quality parameters vs market specs (%	- Total kg sold into specific target markets - Total kilograms complying with specs for specific target markets		

Practice Change Area	Practice Change Types	Productivity KPIs	Data Required to Measure Productivity KPIs	Economic Impact KPIs	Data Required to Measure Economic Impact KPIs
		compliance to spec)			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.
		Selling time (% turnoff at specific times)	- Total kgs sold annually - Total kgs sold at specific times (e.g. seasonal turnoff)		
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.		
Business management	- Decision making/change management - Risk management	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	- Owner/operator labour allowance per FTE (manager versus unpaid family labour)

Practice Change Area	Practice Change Types	Productivity KPIs	Data Required to Measure Productivity KPIs	Economic Impact KPIs	Data Required to Measure Economic Impact KPIs
	- Labour efficiency/labour management - OH & S	Staff retention rate	- No. annual staff turnover as percentage of total number of staff.	- $/business	- 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)
		OH&S incident rate	- Number of OH&S incidents per year.		
		Risk exposure and impact	- Probability of risk occurrence (%) - Likely impact if risk eventuates ($)		

2. Baseline Demographic Data

Once practice change productivity and economic KPIs have been identified, the next step is to collect baseline demographic data from all extension projects/programs (once only for projects/programs with multiple events).

The general demographic data in Table A2 should be collected from all events. Additional data on beef and sheep enterprises should be collected where the project/program aims to achieve practice change adoption for these enterprises.

Baseline data on current management practices is useful where a project has a specific 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. This type of specific targeted practice change would not apply for all projects/events. PDS projects is one example where it would be relevant.

Data from non-producer participants would only need to be collected if these participants are a target audience for the project/program.

Table A2: 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. - 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 - % 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

Demographic Data	Data Collection Requirements
	- % lambs Merino cross - % lambs Non-Merino
Management practices	- Where a project aims to increase the adoption of a specific practice (e.g. ewe pregnancy scanning, phosphorus supplementation of cattle, measuring soil moisture) it is useful to assess baseline levels of current practice, including scale, frequency, methods and timing (e.g. PDS projects on specific topics). - This type of data collection would not be relevant for all projects/events.
Non-producer participants i.e. consultants, product reps, agents, agronomists etc	- Business name/organisation represented - Contact details (phone and email) - Geographical area serviced (region e.g. South West Victoria) - Nature of service provided to industry (e.g. pasture, animal health, reproduction, financial services etc) - No. producers serviced annually - % clients with sheep - % clients with beef - Permission to contact for follow-up evaluation

3. Measuring Attributable Adoption

The next stage in the process of measuring impact is for project/program leaders to identify what information is required from participants (producers and producer advisors) in order to measure adoption, and then to attribute that adoption to their participation in the project/program (Table A3). An alternative to collecting this information directly from participants is to estimate adoption, though this is much more difficult and much less accurate.

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 project/program. In many cases participants were planning to make a particular change anyway and report this as an intent to make a change in post event surveys. In these cases, assessment of attribution therefore assists to determine if their participation in the project/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 A3: 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 (%)	- Would the same change have been at the same time anyway regardless of participation in the event/program (Probability)

Adoption	Attribution of Adoption
- 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) - 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 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) - 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)
Producer Advisors (e.g. consultants, agronomists, stock agents, vets, banks, accountants)	
- How many clients is the information provided through the event/program relevant for? - How many clients have made or intend to make a practice change based directly on advice provided by producer advisor that was obtained from this event/workshop. - Type of practice change/s made (description) - Scale of practice change/s made (i.e. no. livestock/area impacted) - Dis-adoption and timing of impacts information required as above	- Would the same change have been made at a later time anyway regardless of advisor advice (How much later) - Would the outcome of the change have been the same without advisor advice (difference in profit) - Would the same change have been made on the same scale without advisor advice (difference in scale with participation compared to without) - Were other sources of information/support required by the advisor to support the client to make the change (Proportion of required info/skills to make the change obtained from event/program)

Measuring producer adoption and attribution due to producer advisor participation in extension programs is more difficult than directly measuring adoption and attribution for producer participants, however it is likely to represent quite a significant benefit to industry, particularly for projects where advisors are a target audience. Advisor benefits have typically been measured by estimating flow on producer adoption via advisors as a percentage of direct producer participant adoption. Measured or estimated participant on-farm economic impacts from changes made are then extrapolated across this estimated flow on adoption via advisors.

This M&E framework suggests a process for attempting to capture more accurate impact and adoption data due to producer advisor involvement and attendance at extension events. Given that collecting evaluation data from advisors is a relatively new area of focus, it is recommended that a pilot approach be taken to trialling the timing, method and types of information collected to assess the willingness and ability of advisors to provide data and information for evaluation purposes. At the very least, capturing baseline data from producer advisors around the potential application of any new information gained among their client base provides a more accurate basis for estimating flow on adoption. Data around assessing attribution of adoption and impact among advisor clients is much

more difficult to capture second-hand, and may not be worth pursuing. It is suggested that most advisors would have a reasonable idea of the productivity impacts of practice changes made by clients, but may have less insight into the economic impact of those changes.

4. Data Collection Logistics

The final step in the evaluation process is to identify from Tables A4 to A7 the logistics of data collection for different types of events. These events are categorised by MLA as follows:

Category A: Awareness

Category A activities form the initial stage of the learning pathway by seeking to engage producers at an activity level. These activities could include field days, forums / expos, seminars, and farm walks. Generally, the cost is minimal or free for producers to attend.
This category measures satisfaction and value of activities, and intent to change.

Category B: Actions to build knowledge, skills and confidence

Category B seeks to provide the second stage in the learning pathway for producers. At this level, knowledge, skills and confidence will be the primary outcomes measured. These activities provide participants with more in-depth information, including problem-solving activities and a focus on skill development. A facilitator will usually manage group discussion and interaction.

Category C: Supporting adoption and practice change

Category C seeks to measure practice change (adoption), along with shifts in knowledge and skills, to assess ‘how well’ producers understand and can subsequently implement what they have learned.

Each category of event requires slightly different data collection logistics ranging from fairly simple for Category A events to more complex for Category C projects.

Table A4: Timing of data collection by event category

EVENT CATEGORY	Impact Data		Attributable Adoption Data		
	Baseline Data	Post Change Data	Intent	Actual Adoption	Attribution
TIMING OF DATA COLLECTION					
Cat A	At the event/pre-event registration	Post event follow-up	At end of event	Post event follow-up	
Cat B	At the event/pre-event or beginning of program where there are multiple events over time	Post event follow-up and during extension activity where there are multiple events	At end of event and during extension activity where there are multiple events	Post event follow-up and during extension activity where there are multiple events	
Cat C	Beginning of program	During extension activity and post extension follow-up	During extension activity	During extension activity and post extension follow-up	
Producer Advisors	As above for each event category	Post event follow-up			

Table A5: Frequency of data collection by event category

EVENT CATEGORY	Impact Data		Attributable Adoption Data		
	Baseline Data	**Post Change Data**	**Intent**	**Actual Adoption**	**Attribution**
FREQUENCY OF DATA COLLECTION					
Cat A	Once only			Once only, ideally 6-12 months post event depending on practice change areas of focus – may be longer for longer term changes e.g. feedbase.	
Cat B	Once only	Once only or annually (depending on length of project) at appropriate times (e.g. reproduction KPIs after lambing/calving) or seasonally (e.g. feedbase KPIs) depending on type of practice change	At the end of each event for projects with multiple events	At the end of each event for projects with multiple events (excl. 1st event). Once only post event, ideally 6-12 months post event depending on practice change areas of focus – may be longer for longer term changes e.g. feedbase.	Once only, ideally 6-12 months post event depending on practice change areas of focus – may be longer for longer term changes e.g. feedbase.
Cat C	Once only	Annually at appropriate times (e.g. reproduction KPIs after lambing/calving) or seasonally (e.g. feedbase KPIs) depending on type of practice change during program delivery. Once only post event, ideally 12– 24 months post event depending on practice change areas of focus – may be longer for longer term changes e.g. feedbase.	At the end of each event for projects with multiple events	At the end of each event for projects with multiple events (excl. 1st event). Once only post project, ideally 12– 24 months post last event depending on practice change areas of focus – may be longer for longer term changes e.g. feedbase.	Once only post project, ideally 12-24 months post last event depending on practice change areas of focus – may be longer for longer term changes e.g. feedbase.
Producer Advisors	Once only				

Table A6: Method of data collection by event category

<table>
<tr><th rowspan="2">EVENT CATEGORY</th><th colspan="2">Impact Data</th><th colspan="3">Attributable Adoption Data</th></tr>
<tr><th>Baseline Data</th><th>Post Change Data</th><th>Intent</th><th>Actual Adoption</th><th>Attribution</th></tr>
<tr><th colspan="6">METHOD OF DATA COLLECTION</th></tr>
<tr><td>Cat A</td><td rowspan="4">Participant survey at event or pre-event registration</td><td>Phone and/or online surveys/case studies</td><td rowspan="3">Participant survey at end of event</td><td colspan="2">Phone and/or online surveys/case studies</td></tr>
<tr><td>Cat B</td><td>Participant surveys during program and phone surveys, online surveys and/or in person (e.g. case studies) post program</td><td colspan="2">Participant surveys during program and phone surveys, online surveys and/or in person (e.g. case studies) post program</td></tr>
<tr><td>Cat C</td><td>Participant surveys during program and phone surveys, online surveys and/or in person (e.g. case studies) post program</td><td colspan="2">Participant surveys during program and phone surveys, online surveys and/or in person (e.g. case studies) post program</td></tr>
<tr><td>Producer Advisors</td><td colspan="4">Phone and/or online survey</td></tr>
</table>

In terms of collecting the required data around on-farm productivity impacts associated with adoption, for projects which involve an R&D or demonstration component, the required data will be captured for core producers during project delivery. These results can then either be extrapolated to observer participants, perhaps with some discount if considered appropriate depending on the type of practice change made, or if resources and time allow, observer productivity impacts can be collected via follow-up phone/online surveys. For activities with no R&D or demonstration component i.e. training events, follow-up surveys with participants will be required to capture this information.

In terms of collecting the required data to assign an economic value to productivity impacts, for projects which involve an R&D or demonstration component, this information is often collected for core producers as part of the project delivery process e.g. PDS projects. The economic values assigned to key productivity impacts for core producers can then be extrapolated to observer producers adopting the same management change. For activities with no R&D or demonstration component i.e. training events, follow-up surveys with participants can be used to capture this information, however data quality is often poor unless it is collected in person and/or actual farm financial records are used, and producers are often reticent to provide this kind of information. Alternatives are to use existing data sources (e.g. ABARES, benchmarking data) or modelling tools to assign economic values to productivity changes or to develop example economic case studies which represent the key types of practice changes being made by participants. These methods of collecting economic information may require specific expertise in economics which needs to be sourced outside of project delivery resources.

Table A7: Who collects the data by event category

<table>
<tr><th rowspan="2">EVENT CATEGORY</th><th colspan="2">Impact Data</th><th colspan="3">Attributable Adoption Data</th></tr>
<tr><th>Baseline Data</th><th>Post Change Data</th><th>Intent</th><th>Actual Adoption</th><th>Attribution</th></tr>
<tr><td colspan="6">WHO COLLECTS THE DATA</td></tr>
<tr><td>Cat A</td><td rowspan="2">Participant data collected by deliverer/co-ordinator.</td><td>Post program data collected by deliverer/co-ordinator or independent evaluator.</td><td rowspan="2">Participant data collected by deliverer/co-ordinator.</td><td colspan="2">Post program data collected by deliverer/co-ordinator or independent evaluator.</td></tr>
<tr><td>Cat B</td><td>Participant data collected by deliverer/co-ordinator during program. Post program data collected by deliverer/co-ordinator or independent evaluator.</td><td colspan="2">Participant data collected by deliverer/co-ordinator during program. Post program data collected by deliverer/co-ordinator or independent evaluator.</td></tr>
</table>

<table>
<tr><th rowspan="2">EVENT CATEGORY</th><th colspan="2">Impact Data</th><th colspan="3">Attributable Adoption Data</th></tr>
<tr><th>Baseline Data</th><th>Post Change Data</th><th>Intent</th><th>Actual Adoption</th><th>Attribution</th></tr>
<tr><td>Cat C</td><td rowspan="2"></td><td>Participant data collected by deliverer/co-ordinator during program. Post program data collected by deliverer/co-ordinator or independent evaluator.</td><td></td><td colspan="2">Participant data collected by deliverer/co-ordinator during program. Post program data collected by deliverer/co-ordinator or independent evaluator.</td></tr>
<tr><td>Producer Advisors</td><td colspan="4">Deliverer/co-ordinator or independent evaluator.</td></tr>
</table>

Depending on the number of participants involved, the method of data collection and available budget for data collection, post event data could be collected from all participants (e.g. smaller, more intensive projects) or from a subset of participants. For participant subsets, where data is collected remotely via phone or online surveys, ideally a statistically valid sample size should be used where time and budget allows. Alternatively, where more intensive data collection is required over a period of time, a case study approach might be best suited using a smaller number of participants selected to represent the range of practice changes made and key locations of participant businesses.

Appendix A1: User Guide for the M&E Framework

The following 9 steps provide a user guide for this framework, along with an example of the Profitable Grazing Systems (PGS) Lifting Lamb Survival learning package for each step. Appendix A4 provides further information and suggestions around how to implement the framework.

Step 1 – Identify intended outcome of the project/program in terms of on-farm impact for producers. Is significant producer practice change adoption an objective of the project/program? Can the impact of practice changes made be captured in economic terms? If not, this framework will not apply.

Example: PGS Lifting Lamb Survival

- *Lifting Lamb Survival's target outcome is to lift lamb survival by X percentage points across all participants by 20XX*

Step 2 – Align extension project/program to the relevant MLA extension product (Appendix 3) and practice change area (Table 1). If you are unable to link the extension project/program to an existing product, the MLA evaluation team will assist in adding an appropriate product to allow tracking of adoption and impact.

Example: PGS Lifting Lamb Survival

- *This project aligns with the Profitable Grazing Systems product and the practice change area of 'sheep reproductive efficiency'*

Step 3 – Select which practice change types from Table 1 align best with target outcome and practice change area/s.

Example: PGS Lifting Lamb Survival

- *Best aligns with Ewe nutrition (supplements), Ewe CS management and Lambing management practice change types*

Step 4 – Select which productivity KPIs from Table 1 align best with target outcome and practice change area/types.

Example: PGS Lifting Lamb Survival

- *Best aligns with 'lamb survival rate %' productivity KPI*

Step 5 – Select which economic impact KPI from Table 1 aligns best with target outcome and practice change area/types.

Example: PGS Lifting Lamb Survival

- *Best aligns with '$/ewe' economic impact KPI*

Step 6 - Identify the applicable baseline data requirements from Table 2, taking into consideration if farm advisors may be part of the target audience.

Example: PGS Lifting Lamb Survival

- *Requires collection of 'general' and 'sheep enterprise' baseline data (Table 2).*
- *No requirement for non-producer participant data collection as this program does not identify them as a target audience.*

Step 7 - Identify other data collection requirements to demonstrate progress against project/program KPI/s from Tables 1 and 3.

Example: PGS Lifting Lamb Survival requires collection of the following additional data

- *Lamb survival % (Table 1) - No. of foetuses scanned & depending on how it is measured, no. lambs marked or no. lambs weaned.*
- *$/ewe requires the data outlined in Table 1 'data required to measure Economic Impact KPI' column*
- *Table 3 producer Adoption data (No. of participants making change and scale of change etc)*
- *Table 3 producer Attribution data (% of change and impact attributed to project)*

Step 8 – Plan how data will be collected, how often it will be collected, who will collect it and how it will be collated and stored (Table 4). Consider:

- Frequency of data collection i.e. beginning of program, during program, end of program, post-program.
- How it will be collected i.e. participant surveys within program, activities within the program, on-line portals, online surveys, telephone interviews, in person etc.
- How data will be verified for validity/accuracy.
- How data will be stored, collated, analysed and reported.
- How practice change (adoption) and attribution information will be captured.
- Who is responsible for data capture, storage, collation and reporting.

Example: PGS Lifting Lamb Survival requires data to be collected

- *At the commencement of the program by deliverer (baseline demographic data and baseline lamb survival figures) for all participants via participant survey in workshop.*
- *At the end of the program by deliverer (intention to change or actual change and resultant or expected impact on lamb survival outcomes) for all participants via participant survey in workshop.*
- *Post program by deliverer or independent evaluator from a sub-set of participants (adoption, attribution, actual change in lamb survival figures over multiple seasons and economic costs and benefits of practice change implementation) – data collected by phone survey or online survey 12-24 months post program.*

This raw data would be recorded in the PGS evaluation template by the deliverer/independent evaluator and submitted to the PGS coordinator for collation, verification and reporting.

Step 9 - Data analysis and reporting of adoption and impact.

- Raw participant data on productivity and economic impacts for relevant KPI/s is used to calculate a net dollar benefit per adoption unit along with identification of number of adoption units by financial year.
- Adjustment of net dollar benefit/adoption unit and number of adoption units by financial year according to attribution data collected.
- Final net dollar benefit/adoption unit and number of adoption units by financial year will be utilised within the broader MLA monitoring and evaluation framework to assess return on investment in the product area over the relevant assessment period (e.g. 25 years 2020/21-2045/46).

To assist with this analysis, modelling tools such as the recently updated Rendell McGuckian model may be used. This estimates the individual farm as well as industry-wide economic benefits of on-farm practice changes.

Example: PGS Lifting Lamb Survival requires

- *Calculation of average additional net profit per ewe for producers adopting a practice change, including accounting for attribution of impact to project participation.*
- *Identification of total number of ewes impacted by practice change adoption by financial year over the evaluation period (e.g. 25 year period), including accounting for attribution of adoption units by year of adoption to participation in the project.*

Appendix A2: Example of Impact M&E Plan for 'BeefUp' Aligned to the M&E Framework

Impact Criteria	What data needs to be collected and from whom	How data is collected	When data is collected	Who is responsible	Data storage
Baseline Data	Participant demographics (all participants) • business contact details • # ha • # hd (breeders and total) • # participants per business • # non-producer participants	Online registration form via MLA CRM	Before event as part of registration process	Event organiser	MLA's CRM
	Baseline for key practice changes (all participants) • # businesses that preg test and CS breeders • Current pregnancy testing rates • # businesses that measure cow mortality • Current cow mortality • Current calf marking rates • # businesses that use supplements to manage CS in breeders	Online registration form via MLA CRM	Before event as part of registration process	Event organiser	MLA's CRM
Key Practice Changes & KPIs	<u>Beef Reproductive Efficiency</u> (as one example): **1.** Use of pregnancy testing • # businesses preg. testing before and after 'BeefUp' • Preg. testing rates before and after 'BeefUp' (conception rate %*) **2.** Use of supplements to improve CS for joining and calving • # businesses changing supplement use following 'BeefUp' • # businesses CS cows before and after 'BeefUp' • Calf survival before and after 'BeefUp' • Calf marking %* before and after 'BeefUp' • Breeder mortality (%) before and after 'BeefUp' Collect intent to change from all participants Collect actual adoption from a statistically valid sub-sample size *All % to be calculated from raw data	Baseline collected via online registration form via MLA CRM Intent to make change collected as part of end of event paper-based evaluation after facilitated ORID Actual changes collected via post event follow up 6-12 months later (phone calls)	Baseline collected before event as per above Intent to make changes collected at end of event Actual change collected after event as part of follow up	Event organiser Event organiser Evaluation manager oversees survey team	MLA's CRM or data downloaded from CRM to spreadsheet with additional data added

Impact Criteria	What data needs to be collected and from whom	How data is collected	When data is collected	Who is responsible	Data storage
Adoption & Attribution	Practice changes and KPIs above form the basis of a post-event follow up process to measure adoption and attribution. Key questions include: • Has any of the following <insert KPIs above i.e. calf survival %> changed since you attended 'BeefUp'? • If so, do you attribute the change to information/skills gained at 'BeefUp'? • If yes, how important was 'BeefUp' <insert multiple options that grade the importance of 'BeefUp' to the change>	Actual changes collected via post event follow up 6-12 months later as phone interviews with structured questions.	Actual change collected after event as part of follow up	Evaluation manager oversees survey team	MLA's CRM or data downloaded from CRM to spreadsheet with additional data added
Impact	Data to be collected from participants that identify having made a change from post-event follow up in the form of a case study: • Productivity benefit of change relative to KPIs above i.e. change in conception rates, calf survival/marking rates and breeder mortality. • Costs of making the change • $ and other benefits of making the change • Timing of implementation • Estimates of time taken to realise full benefits • Scale of change • Any other relevant data	In depth case study	6-12 months post event	Evaluation manager oversees evaluation specialist to construct case study	Participation in case study noted against record in MLA's CRM or project spreadsheet. Case study data recorded in separate file.

Appendix A3: Current MLA extension related products and their key practice change areas

Additional products to be added as required.

Product Code	Product Name	Practice Change Area Product Code	Practice Change Area
p00308	Producer Demonstration Sites (PDS)	p00308f	PDS Feedbase (2021-25)
		p00308g	PDS Sheep reproductive efficiency (2021-25)
		p00308h	PDS Animal wellbeing (2021-25)
		p00308i	PDS Marketing (2021-25)
p00567	BeefUp forums	p00567e	BeefUp forums - Business management (2021-25)
		p00567f	BeefUp forums - Feedbase (2021-25)
		p00567g	BeefUp forums - Beef reproductive efficiency (2021-25)
		p00567h	BeefUp forums - Animal wellbeing (2021-25)
		p00567i	BeefUp forums - Marketing (2021-25)
		p00567j	BeefUp forums - Genetics (2021-25)
p00637	MeatUp forums	p00637a	MeatUp forums – Business management (2021-25)
		p00637b	MeatUp forums - Feedbase (2021-25)
		p00637c	MeatUp forums – Beef reproductive efficiency (2021-25)
		p00637d	MeatUp forums – Sheep reproductive efficiency (2021-25)
		p00637e	MeatUp forums - Animal wellbeing (2021-25)
		p00637f	MeatUp forums - Genetics (2021-25)
		p00637g	MeatUp forums - Marketing (2021-25)
p00655	'Back to Business' bushfire recovery program	N/A	- Sheep reproductive efficiency - Beef reproductive efficiency - Feedbase - Genetics - Marketing - Animal wellbeing - Business management

Product Code	Product Name	Practice Change Area Product Code	Practice Change Area
p00650	BESTWOOL/BESTLAMB & BETTERBEEF extension program	N/A	- Beef reproductive efficiency - Feedbase - Genetics - Animal wellbeing
p00386	BredWell FedWell – Southern Beef	p00386c	Beef reproductive efficiency (2021-25)
	BredWell FedWell – Sheep	p00386d	Sheep reproductive efficiency (2021-25)
p01158	Dieback management & extension program	N/A	Business management
p00138	EDGEnetwork® producer extension courses & workshops - Northern Business	p00138e	Business management (2021-25)
	EDGEnetwork® producer extension courses & workshops - Southern Business	p00138d	Business management (2021-25)
	EDGEnetwork® producer extension courses & workshops - Northern Breeding	p00138f	Beef reproductive efficiency (2021-25)
	EDGEnetwork® producer extension courses & workshops – Northern Nutrition	p00138g	Feedbase (2021-25)
	EDGEnetwork® producer extension courses & workshops – Grazing land management	?	Feedbase
	EDGEnetwork® producer extension courses & workshops – Grazing fundamentals	?	- Sheep reproductive efficiency - Feedbase - Genetics - Animal wellbeing - Business management
p00634	Beeflinks productivity & extension program	?	- Beef reproductive efficiency - Feedbase - Markting

Product Code	Product Name	Practice Change Area Product Code	Practice Change Area
			- Genetics
p00405	Profitable Grazing Systems	p00405f	PGS - Business management (2021-25)
		p00405g	PGS - Feedbase (2021-25)
		p00405h	PGS - Sheep reproductive efficiency (2021-25)
p00339	Producer research sites (participatory R&D)	p00339a	PRS - Feebase
		p00339b	PRS – Phosphorus supplementation
		p00339c	PRS – Northern pain relief
p00681	Northern Breeding (NB2)	N/A	Beef reproductive efficiency
p00443	Northern Australia Climate Program (NACP)	N/A	- Feedbase - Beef reproductive efficiency - Animal wellbeing - Marketing
p00517	Lamb Survival/Weaning Productivity Tools and Practices	N/A	Sheep reproductive efficiency
?	FAP eLearning Project	N/A	Feedbase
?	T90 Project	N/A	Sheep reproductive efficiency
p01269	NSW Rangelands Living Skin research & extension program	N/A	Feedbase
p00330	ParaBoss (integrated parasite management) web resources & extension	N/A	Animal wellbeing
p00564	Model for forecasting of extreme climate events	N/A	- Feedbase - Beef reproductive efficiency - Sheep reproductive efficiency - Animal wellbeing - Marketing
p01268	Wambiana grazing trials/strategy program	N/A	Feedbase

Appendix A4: Critical Success Factors for Implementing the Evaluation Framework

Implementing the MLA extension M&E framework requires a change in approach and mindset about the way evaluation is implemented within an extension project. Evaluation processes are often viewed by deliverers as 'add-on' activities to the project/event. For example, most evaluation is presented as a one page 'happy sheet' at the end of an event/project when many participants have slipped out early or are tired and rushed to get away at the end of the session. The result is not quality data collection, nor is it useful data collection, often not enabling collection of crucial information. Answers may be guessed or rushed, or some questions not completed at all.

For evaluation to be useful and meaningful to both the collector and participant, a different approach is needed. Here are some examples of how data can be collected as a start for discussion:

1. **Baseline data (demographics and current practice)**

   Most baseline data can be collected pre-event/project as part of a registration and initial engagement process. When collected pre-event/project, this data can be valuable for planning as it allows the deliverers an insight into who the audience is and what their needs are as well as what they currently do. Online participant registration platforms can be designed to include simple data collection, or at least link registration details to previous participation lists (where data already exists) so that follow up baseline data collection only needs to take place with new participants.

   Even if online registration is not used, pre-event/project registration can allow organisers to communicate with participants and collect verbally or via online forms relevant data such as baseline demographics, what they want to get out of the event/project and what their current practices are.

2. **At event data collection (short event)**

   If pre-event data collection occurs, 'at event' data collection is minimised. If an event is something that is a proven tested format, there is little need to ask if participants 'liked' the event or sessions or if they would recommend it to others (note this is different if it is a pilot). Data collection 'at event' becomes targeted to 'what did they learn that was useful to them' and 'what they intend to do with this information/skills post event'. This works for short (1/2 day or full day events).

3. **At event/during project delivery data collection (multiple days)**

   If the event/project involves a series of workshop days/field days, evaluation of KASA, intent to change and actual practice change needs to be built into the content and process so that it is collected as part of the event delivery process at different stages. For example, if the activity is designed to improve lamb survival, then day 1 would involve data collection as a group activity of current lamb survival and discussion about where producer issues are, with the

deliverer recording the results. As the activity is rolled out over multiple days, the deliverer would facilitate discussion amongst participants about what changes they are going to make and record these for future reference. By the time the workshop is on its final day, participants are primed to report back on any new lamb survival data generated during the program's timeframe which can then be recorded by the deliverer. The final day would involve a process where participants are encouraged to articulate verbally or on paper what other changes they intend to make and these are recorded for follow up at a later date.

Other approaches include having participants set themselves tasks or projects that relate to practice change and then having them report back at the next session to the group. The crucial part is that the deliverer records this information in some format for future reference and then follows up. This is a process used in many formal leadership or business development training programs where participants are encouraged to implement as they go their new knowledge and skills and complete 'projects'. The challenge is for the deliverer/program evaluator to record practice change progress for each participant to monitor progress and impact. It is not difficult but does require a conscious change in the way events are designed and run. To ensure data collection is done, templates are required to enable it to happen effectively and efficiently.

4. **Post event/project data collection**

Development of follow-up data collection to monitor whether intent to change resulted in actual change and to assess the impact of the change is crucial for measuring impact over time. This can be done several ways, such as follow up phone interviews, follow-up day where participants report back to the group on changes made, and longitudinal case studies. These are all processes that keep participants engaged in making change and provide event deliverers valuable information regarding the changes participants are making and what the challenges are.

Who should do the data collection?

Ideally the deliverer/facilitator of the program if it is a multi-day event, mainly because it keeps them engaged with their participants and gives the deliverer/facilitator valuable insights into what participants have taken from the event/activity.

For short events, the follow-up can be done by the deliverer/facilitator or by an independent evaluator who has knowledge of the event to context the data collection.

What happens with the data collected?

Not only should the data be collated, impacts calculated and reported to the funding organisation/s, but evaluation data should also be collated and reported to the deliverer/co-ordinator. In some cases (for longer programs) it can also be shared with the participants so they can see the impact of their practice changes and how their data is used for evaluation purposes.

Deliverers and participants are often sceptical about what happens to their data with good cause, as it is rarely shared with them after collection so they never know what happens to it, how it is used and what it means. To change this perception, evaluators need to report back and get feedback from deliverers and participants to ensure data reported is accurate and relevant to the program being evaluated.

The theory supporting this approach

Modern coaching theory, neurolinguistic programming and neuro science support the practice of having participants think and then articulate to their peers, the changes they intend to make. This process helps to imbed change in the mind of the participant as well as providing opportunities for feedback from peers and on-going evaluation of adoption and impact. Holding participants to account for the changes they have articulated is very successful at ensuring they take action, and if they come up against issues or challenges with implementation, this process gives them an audience to discuss these difficulties to assist with finding solutions. Again, this can be used to evaluate the success of the program as well as evaluate impact, adoption and attribution.

Making practice change and problem solving a focus of delivery, as opposed to awareness, knowledge and skill acquisition (which is the focus of most current extension programs), not only improves the likelihood participants are supported to make change but makes it much easier to determine adoption, attribution and impact of a program. It does not take much to 'tweak' an existing program to incorporate evaluation for impact into delivery. All it takes is a change of focus on the outcome of the extension event to incorporate simple ways to develop data collection for evaluation that enhances practice change outcomes as well as the ability to measure impact.

10.0 Appendix B – Summary of Results from Assessment of Adoption Products Against the M&E Framework

Table B1: Products not assessed against the M&E Framework

Product Code & Title	Projects Related to Product	Status and Comments
p00330 - ParaBoss	P.PSH.0792: ParaBoss – Phase II and Phase IIa L.ADP.2028: ParaBoss Communication Activities B.AHE.0314: ParaBoss for cattle parasites P.PSH.1320: ParaBoss Phase III Producer Communication, Extension and Adoption Delivery and Website Management L.ADP.2204: Paraboss Phase III Advisor training	**M&E Framework Status:** Framework to be applied in future. **Impact Assessment Status:** Not able to be assessed for current evaluation. May be able to be assessed in future. **Comments:** The contract for the project for the extension phase of this product has only recently been signed and thus the project is in the development phase with no plan of activities or MER plan to assess.
p00410 - It's Ewe Time	No new investments in delivery since 2017/2018	**M&E Framework Status:** Product is complete. **Impact Assessment Status:** Has previously been assessed, most recently for project L.LSM.0025. **Comments:** No events have been run since June 2019, and there are no plans currently in place to deliver future activities.
p00275 - More Beef from Pastures	No project investments	**M&E Framework Status:** No projects currently funded. **Impact Assessment Status:** No investment to assess against.

Product Code & Title	Projects Related to Product	Status and Comments
		Comments: No projects currently funded or planned.
	P.PSH.1171: Phase 2 – Maximising the reproductive potential of the meat sheep industry by eliminating high oestrogen clovers, more live lambs on the ground	**M&E Framework Status:** Project is complete. **Impact Assessment Status:** Was assessed in 2019 for project L.ADP.1903.
	L.LSM.0004: Improving lamb survival by optimizing lambing density and mob size	**M&E Framework Status:** Project is complete. **Impact Assessment Status:** Has been assessed for project L.LSM.0025 but updated for the current impact assessment.
p00650 - BESTWOOL/BESTLAMB & BETTERBEEF extension program	P.PSH.1234 Innovative sheep and beef networks	**M&E Framework Status:** Framework to be applied in future. **Impact Assessment Status:** Not able to be assessed for current evaluation. To be assessed in future. **Comments:** This project is in the development phase with no plan of activities or MER plan to assess.
EID Enabled Stimulating the Information Supply Chain (no product code)	P.PSH.0923 EID enabled stimulating the information supply chain	**M&E Framework Status:** Project is complete. **Impact Assessment Status:** Not able to be assessed **Comments:** Project is complete and no data is available for adoption and impact measurement.

11.0 Appendix C - Product Assessment Against the M&E Framework: 'BeefUp'

Product Code: p00567

Product Title: BeefUp

Secondary Product Codes & Titles

- p00567e - BeefUp - Business management (2021-25)
- p00567f - BeefUp - Feedbase (2021-25)
- p00567g - BeefUp - Beef reproductive efficiency (2021-25)
- p00567h - BeefUp - Animal wellbeing (2021-25)
- p00567i – BeefUp – Marketing (2021-25)
- p00567j – BeefUp – Genetics (2021-25)

Projects Included:

- L.GFB.1800 BeefUp Coordination
- B.FUP.2020 BeefUp Coordination 2020-2022
- B.FUP.2021 BeefUp Coordination and Delivery 2021-2023

Project(s) Start Date/End Dates: 02/09/2019 to 29/03/2024

Delivery Organisation: Capacity in People Consulting P/L coordinate the 'BeefUp' forums

Product Description

MLA's 'BeefUp' Forums (1/2 to 1 day) aim to present clear and practical take home messages and encourage producers to implement practice change on-farm, assisting northern beef producers to lift productivity and profitability.

'BeefUp' forums also encourage producers to register their interest in other extension programs such as 'PDS', 'EDGEnetwork' and 'PGS'.

Product Objectives

Promotion:

- Promotion of 'BeefUp' Forums coordinated by the 'BeefUp' Coordinator.
- Participation at the 21 BeefUp's totals >2,100 attendees.

Value for MLA:

- Increased producer awareness of what MLA does and the relevant RD&A it funds (reinforced by all presentations having a linkage to MLA).
- R&D, Adoption and Marketing incorporated into each 'BeefUp' forum booklet.

Pathway to Adoption:

- Producers agree they were exposed to practical information and tools they could use on farm immediately to assist them improve business productivity and profitability.
- All events facilitate a clear pathway for producers to attend an 'EDGEnetwork', 'PDS', 'PGS' and/or other relevant extension and adoption events (which have an MLA linkage).

Regional Consultation:

- An increased awareness of the opportunity for producer participants to have their say on MLA's on farm investment priorities via the RBRC.
- Producers agree MLA is consulting with them in relation to regional RD&A priorities.
- Producers understand what MLA is doing to address their regional RD&A priorities.

Monitoring and Evaluation:

- Overall participant satisfaction, value levels and intent to change match or exceed 2018 and 2019 evaluation outcomes.
- Post event surveys conducted using the agreed template provided by MLA.
- Event survey data provided to MLA in excel spreadsheet form using the agreed template provided by MLA.
- Event survey data to be provided to MLA (as outlined above) within three weeks from the date of the 'BeefUp' event.

Quarterly and annual reporting of M&E data from events to be provided in the agreed template supplied by MLA.

Targets are:

- 21 events (9 in 2021, 8 in 2022, 4 in 2023)
- 2,100 attendees
- Referrals to other MLA products i.e. PGS, PDS, EDGE etc

Assessment of Current Data Collection Against the M&E Framework

Data collection has been assessed against each of the five elements of the M&E Framework in the following section. These elements include:

- Baseline data collection – Table A2 of the M&E Framework: Participant contact details, general demographic data, permission for follow-up contact for evaluation purposes, and in some cases includes baseline practices around specific management areas related to the product.
- Measuring productivity impact – Table A1 of the M&E Framework: Collection of data that allows for estimates of productivity improvements resulting from management changes made across a range of identified key practice change areas.
- Measuring economic impact – Table A1 of the M&E Framework: Assessment of economic impact (additional net profit) in terms of either valuing productivity improvements and/or reduced costs resulting from management changes made across a range of identified key practice change areas.
- Measuring adoption – Table A3 of the M&E Framework: Assessing the number of producers who make a change, the timing of the change and the number of adoption units (e.g. area/no. livestock) impacted by the change for each producer.
- Assessing attribution of adoption and impact – Table A3 of the M&E Framework: Estimating the degree to which involvement in the MLA project contributed toward the decision to make a practice change and the level of benefits received as a result of making that change.

Baseline Demographic Data

Recommended baseline data collection is provided in Table A2 of the M&E Framework.

Table C1 provides a summary of product alignment with the M&E Framework for collection of baseline demographic data.

Table C1: Alignment of 'BeefUp' product with the M&E Framework for collection of baseline demographic data

Criteria for Assessment	Evidence	Improvements Needed to Align with MLA MER Framework
What data is collected?	Baseline data collected by participant consists of: • # ha • # head • # breeders Data collected on type of participant i.e. producer/non-producer but not able to be separated by business. Participants asked if they can be contacted for further evaluation (opt in option). No data collected about current practices	The **business name** for each participant needs to be added so that demographics (# ha, # hd) for multiple participants from the same business are not double counted. This would allow number of businesses attending to be identified as well as number of participants. **Current practices**: 'BeefUp' needs to identify what current practices the event is targeting e.g. improving beef reproduction efficiency then ask questions regarding this such as do you pregnancy scan etc to gather information about current practice that can be followed up post-event to see if it has changed. **Non-producer participants**: If 'BeefUp' considers this audience to be a target, then basic information about them needs to be collected. Table A2 of the framework has suggestions for this. Baseline data required for each business (producer and non-producer) (As identified in Table A2 from M&E Framework): • Beef enterprise data • Management practices (as identified relevant to 'BeefUp' forum content/aims) • Non-producer demographics (if this considered to be a target audience) Suggestions for non-producer demographics are: • Business name/organisation represented • Contact details (phone and email) • Geographical area serviced (region e.g. South West Victoria) • Nature of service provided to industry (e.g. pasture, animal health, reproduction, financial services etc) • No. producers serviced annually • % clients with sheep • % clients with beef • Permission to contact non-producers for follow-up evaluation

Criteria for Assessment	Evidence	Improvements Needed to Align with MLA MER Framework
		Depending on 'BeefUp' content, may want to collect information regarding if they already engaged in PDS/PGS or have seen these research results before or why they are there (pick up new information, network, listen to a particular presentation/speaker).
When is it collected?	At the end of the event	Suggest collect demographics/current practices as part of event registration – pre-event rather than at event.
Who is it collected from?	All attendees present at the end of the workshop	All attendees including walk ups on the day.
How is it collected (incl. who collects it)?	Paper feedback form by deliverer	Online registration process or manual data collection from participants as they register. Walk-ups at events would need to fill in registration form as they arrived (paper or electronic).

Productivity Impact Data

Recommended data collection for measuring productivity impacts for a range of identified key practice change areas is provided in Table A1 of the M&E Framework.

Table C2 provides a summary of product alignment with the M&E Framework for collection of productivity impact data.

Table C2: Alignment of 'BeefUp' product with the M&E Framework for collection of productivity impact data

Criteria for Assessment	Evidence	Improvements Needed to Align with MLA Framework
Key target practice change area/s aligned to Table A1 of M&E Framework	• Business management • Feedbase • Beef reproductive efficiency • Animal wellbeing	
ID of productivity KPIs? (Y/N)	No	Practice change KPIs (As identified in Table A1 from M&E Framework for KPIs) • From 'intent to change' information at end of event • From post event follow-up, what have been the productivity impacts of changes made 'BeefUp' needs to consider what practices they are targeting with their information and if possible, collect baseline statistics as well as post program to determine if

Criteria for Assessment	Evidence	Improvements Needed to Align with MLA Framework
		and what changes have been made e.g. change in calving rates or cow mortality etc.
What data is collected?	None	Productivity impact data would ideally be collected from post-event interviews where participants are asked what change have they made as a result of 'BeefUp' and the impact it has had on their business. Some of this will be speculative as changes will not have had an impact yet and the impact may need modelling as part of case studies (see Economic impact in next table).
When is it collected (timing and frequency)	N/A	Post event – 6-12 months.
Who is it collected from? (producers vs advisors) (All participants/some participants)	N/A	Sub-set of participants – minimum of 10% of producer participants or a statistically valid sample size.
How is it collected (incl. who collects it)?	N/A	Phone interviews with follow up email for those participants whose changes warrant a case study

Economic Impact Data

Recommended data collection for assessing economic impact for a range of identified key practice change areas is provided in Table A1 of the M&E Framework.

Table C3 provides a summary of product alignment with the M&E Framework for collection of economic impact data.

Table C3: Alignment of 'BeefUp' product with the M&E Framework for collection of economic impact data

Criteria for Assessment	Evidence	Improvements Needed to Align with MLA MER Framework
ID of economic impact KPI? (Y/N)	No economic KPIs identified for this product	If BeefUp's aim is to have an economic impact on participants, then it will need to identify economic KPIs for measurement. Once productivity KPIs have been identified for 'BeefUp' (table above), the appropriate economic KPI that relates to productivity can be identified from Table 2 of the framework. Data can be sourced to demonstrate impact: • From post event follow up, impact on farm of changes made/being made (speculative or actual) • And/or estimates made using other data sources or modelling
How is economic impact to be measured? E.g. participant data, modelling, existing industry data etc	N/A	As collection of economic data from producers over the phone is difficult and typically lacks accuracy, it is recommended that information is collected via case studies from a sample of participants representing the types of practice changes made by participants. This will provide a more accurate method for assessing economic impact. Alternatively, economic impact of productivity

Criteria for Assessment	Evidence	Improvements Needed to Align with MLA MER Framework
		changes identified from post event follow up, can be estimated or modelled using other data sources.
What data is collected?	None	Estimates of economic impact from participants that relate to practice changes.
When is it collected (timing and frequency)?	N/A	Post-event via phone interviews.
Who is it collected from? (producers vs advisors) (All participants/some participants)	N/A	The number of case studies that would be conducted would be indicative of the range of practice change observed from the follow up interviews. We have suggested at least 5 -10 but this is a guide only.
How is it collected (incl. who collects it)?	N/A	Collected over the phone from interviews with follow up email to confirm assumptions. Skilled evaluator would be required to model the economic impact and data would be collected by skilled interviewers.

Adoption Data

Recommended data collection for assessing adoption is provided in Table A3 of the M&E Framework.

Table C4 provides a summary of product alignment with the M&E Framework for collection of adoption data.

Table C4: Alignment of 'BeefUp' product with the M&E Framework for collection of adoption data

Criteria for Assessment	Evidence	Improvements Needed to Align with MLA MER Framework
# Participants including non-producers	2018/19 = 1,328 2021=389	
What data is collected (ie intent/actual change)	Evaluations at event collect intent to change (for 2021 events) with some words around what changes participants are contemplating. These changes have not been collated or analysed to identify practice change themes.	Adoption data (As identified in Table A3 from M&E Framework) to be collected includes: • 'Intent to change' collected at the end of event with detail of type of change to be made • Actual adoption of intention to change and scale/scope/timing of change collected post event follow-up. Intent to change information gathered at events needs to be collated and themed to show quantitative results i.e. X % of participants are intending to make changes to reproduction etc.

Criteria for Assessment	Evidence	Improvements Needed to Align with MLA MER Framework
When is it collected (timing and frequency)?	Once only on the day and at end of event	End of event – collect intent to change. Post-event follow up would confirm if intent to change became actual change.
Who is it collected from? (producers vs advisors) (All participants/some participants)	Collected from all attendees (40% return rate for 2021 evaluation data)	Collect from all participants their intent to make change and what this change might be. As noted above for baseline data, this needs to be able to be expressed as adoption data per business not per participant.
How is it collected (incl. who collects it)?	Paper based form	End of event – paper form by event organisers Post-event as interviews conducted by experienced interviewers.

Attribution Data

Recommended data collection for assessing attribution of adoption and impact is provided in Table A3 of the M&E Framework.

Table C5 provides a summary of product alignment with the M&E Framework for collection of attribution of impact data.

Table C5: Alignment of 'BeefUp' product with the M&E Framework for collection of attribution of impact data

Criteria for Assessment	Evidence	Improvements Needed to Align to MLA MER Framework
What data is collected?	No data collected	Attribution data required includes (As identified in Table A3 from M&E Framework) • Participation in other MLA products (for follow up and reference post event) as a result of attending 'BeefUp' • Contribution of 'BeefUp' to any changes made post event
When is it collected (timing and frequency)?	N/A	Post event interviews with a sub-set of participants.
Who is it collected from? (producers vs advisors) (All participants/some participants)	N/A	Sub-set of producer participants.
How is it collected (incl. who collects it)?	N/A	Phone interviews- as per above suggestions.

General Recommendations for Implementation of M&E Data Requirements

Before specific actions for improved M&E for 'BeefUp' can be taken, the purpose of 'BeefUp' needs to be reviewed to determine if there is a need to capture economic impact data from this type of event. As a half to one day category A event, 'BeefUp' cannot be expected to be the cause of a major practice

change with significant economic impact. It's role is most likely as a trigger for change that may/may not lead to participants participating in further MLA extension or obtaining additional information/skills from other places to enable them to explore the viability of and implement the desired change.

As a starting point for following a change journey in participants, it is suggested that data collected from 'BeefUp' participants needs to be able to be linked to participation in other MLA extension products. This would see the data collected from participants in 'BeefUp' integrated with the other product's economic impact evaluation e.g. as a result of attending a 'BeefUp' event a producer subsequently enrols in 'PGS' where they make practice changes which are evaluated for economic impact.

In its simplest terms, 'BeefUp' evaluation could be improved by undertaking the following:

- Collecting baseline data as part of the program registration process including business name so that multiple participants from the same business do not have their demographics double counted.
- Capturing at the end of the workshop more information about intention to change and preferences for follow up regarding engagement with other MLA products.
- Conducting interviews 6-12 months post event to relate intention to change with what has actually happened since. These interviews would also collect information relating to attribution as well as economic impact. Recommend a statistically valid sample or at least 10% of attendees are followed up and questions relating to attribution are also asked.
- If adoption is deemed to be a desirable outcome, a number of case studies over time are suggested to follow the journey of the participant from 'BeefUp' to participation in other MLA products and what the impact of any practice changes made due to involvement in those follow-up products has been. The number of case studies required would be dependent on the different types of change that participants have made and can only be determined once the post-event follow up has been conducted. In addition, case studies may be 'joint' case studies with other extension products such as 'PGS' if the 'BeefUp' leads the participant to enroll in other products.

Data Collection, Collation, Analysis and Storage

Data needs to be stored in a format that allows it to be interrogated per participant and per business. It needs to allow for follow-up interviewers to be able to access all participant data including intention to change to be able to ask questions that relate to previously captured data.

Evaluation reports generated need to be able to link all the data sets together i.e. pre-event, at event, post event and allow data sharing of participants through to participation in other MLA extension products.

Data storage needs to be able to identify repeat participants who have attended multiple 'BeefUp' events.

Analysis of data to be a project management responsibility but may initially be outsourced to evaluation expert to build project manager capability and processes.

Economic impact to be calculated by evaluation expert (internal to MLA or external) based on data collated and submitted by project manager. If no case studies, economic impact will likely need to be modelled based on 'average' scenarios with scenario and/or sensitivity analysis depending on the type of changes being made and the amount and quality of data that producers were able to provide during follow-up phone surveys.

Additional Resources Required to Implement Recommendations

Estimates of cost to undertake improved M&E data collection and analysis based on 5% budget for M&E as per current contract.

Total project budget	$ 1,542,609	Projected number of participants	2,000
% of budget for M&E	5%		
		10% follow up interviews	200*
Total budget for M&E	$ 77,130.45		
		Cost per interview	$ 130
Collection, collation and analysis of pre-event data	$ 10,000		
Collection, collation and analysis of post-event data	$ 10,000	Number of cross program case studies	5**
Follow up interviews with participants	$ 26,000		
Collation, interpretation and reporting post workshop	$ 10,000	Cost per case study	$ 3,000
In depth case studies	$ 15,000		
Reporting and comms	$ 6,000		
Total budget	$ 77,000		

**Statistically valid sample size with a 90% confidence level and 5% error margin would be 239.*

***Would ideally do more case studies if budget allowed to better capture range of practice change types being made.*

Key personnel required:

- *M&E manager (suggest project manager develop capability themselves or oversee a contractor) to design and implement data collection processes and analyse and report data.*
- *Interviewers for post follow up interviews – operating under direction of M&E 'BeefUp' manager*
- *Evaluation expert (internal or external) to oversee data analysis and reporting and to calculate impact/develop case studies – to work in conjunction with 'BeefUp' manager.*

Impact Assessment

Assessed for current project.

12.0 Appendix D: Product Assessment Report: p00567 'BeefUp'

KEY FINDINGS

Product Code & Title

p00567 BeefUp forums practice changes

Secondary Product Codes & Titles

p00567e - BeefUp – Business management (2021-25)
p00567f - BeefUp - Feedbase (2021-25)
p00567g - BeefUp – Beef reproductive efficiency (2021-25)
p00567h - BeefUp – Animal wellbeing (2021-25)
p00567i – BeefUp – Marketing (2021-25)
p00567j – BeefUp – Genetics (2021-25)

Species

100% cattle

Zone

Northern Beef zone – 100%

Impact

% of benefits due to increased production/reduced losses: 100%

% of benefits due to reduced input costs: 0%

Practice Change Area	Net Benefit/Head
Business management	$ 2.84
Feedbase	$ 3.30
Beef reproductive efficiency	$ 3.22
Animal wellbeing	$ 1.35
Genetics	$ 2.34
Marketing	$ 2.60

Adoption

Benefits commence in 2021/22 with peak adoption expected in 2023/24 at 145,606 head of cattle.

Practice Change Area	Peak Adoption (Head)
Business management	2,912
Feedbase	53,001
Beef reproductive efficiency	14,124

Animal wellbeing	2,038
Genetics	72,949
Marketing	582

These adoption numbers are in addition to those provided for the previous impact assessment of 'BeefUp' in 2019 based on delivery of new events. Adoption numbers will be further updated on an annual basis up to 2025.

Attribution

100% to MLA

Investment

The investment by MLA in 'BeefUp' for the assessment period was $?.

Product Description

Category A Extension Program

'BeefUp' is a one-day forum aimed at creating awareness of key issues, MLA programs, best practice and new research data. It is run in northern Australia and began in 2010. It utilises leading industry experts and consultants to deliver key messages. Participants are sign-posted to other programs and sources of information for follow up afterwards. It is considered to be a 'feeder activity' to other programs i.e. creates awareness and appetite for other MLA programs.

Since the previous impact assessment of 'BeefUp' conducted in 2019, four events have been run which have involved 232 producer participants across the northern cattle producing regions of Australia.

Data Assessment (brief summary of the impact and adoption data available)

Available data from 'BeefUp' M&E includes numbers of producer participants, estimated total number of cattle per producer, intent to change and type of change intended. Evaluations reveal that 52% of producer participants that completed an exit survey indicated an intent to make a change as a result of attending 'BeefUp'[8]. No data was available to assess actual adoption, attribution or impact.

To estimate actual adoption and impact for the 2019 'BeefUp' impact assessment interviews were conducted with 40 participants from 33 forums. Unfortunately, of the interviewees that had made a change since 'BeefUp', few were able to describe the change in enough detail to form case studies or develop a model for most likely change. Instead, impact was estimated from case studies of similar changes made by producers participating in 'More Beef from Pastures' events (MBfP) (Howard *et al*., 2014). This was not ideal as these figures represent participants in Category A, B and C events in Southern beef producing regions, but was the only estimate of potential impact that was obtainable for the timeframe of the evaluation.

8 Data from 122 (53%) forum participants as captured on M&E response forms

Given that the current impact assessment did not involve an opportunity to collect further data from more recent 'BeefUp' participants, revised data from the 2019 assessment has been used to assess impact and to inform the assumptions around attribution and adoption for the current impact assessment.

Counterfactual (what would have happened without 'BeefUp')

To estimate the counterfactual situation for the 2019 evaluation (what would have happened without 'BeefUp'), the participants of 'BeefUp' forums were interviewed and those who had made changes were asked if they would have made the change anyway. If they would have made change, they were asked if it would have been on the same scale and in the same time frame, with estimates, if possible, of delay in time frame. Table D1 outlines their responses.

Table D1: Participant responses from 2019 evaluation interviews asking whether they would still have made the change if they had not attended 'BeefUp' forums

	% of participants making a change*	Average time to implement w/o BeefUp
Yes - on same scale and at same time	24%	
Yes - on same scale but later on	18%	1.5
Yes - on smaller scale and later on	12%	No estimates
No	35%	
Don't know	12%	
Grand Total	**100%**	**1.5**

*30% of participants said they had made a change and a further 3% thought they would make a change in the future and another 10% thought they may make a change.

Participants that made changes post 'BeefUp' were also asked if they would still have been able to achieve the same level of profit benefits if they had not attended the forums. Of the 24% that would have made change at the same time and scale without 'BeefUp' (Table D1), 25% said they would have made less profit. As no interviewee was able to estimate the reduction in profit if they had not attended 'BeefUp', a figure of 10%[9] was used based on responses from interviews with 'It's Ewe Time' participants.

In the absence of any new information since the 2019 evaluation, this information has also been used for the current assessment to model a counterfactual adoption and benefit scenario and to create an adoption profile that reflects the 'with investment' scenario (see next section).

9 Figure based on estimate made from interviews made by one participant from 'It's Ewe Time' forum. No other participants were able to quantify the reduction in profit if they had not attended 'BeefUp'.

Impact (what is actual or expected impact and how has this been measured)

Data from the four 'BeefUp' events assessed indicates that 52% of producer participants expressed an intent to make a change in post event surveys. Where possible the practice change area was identified based on the information contained in the event database. For producers who indicated an intent to change but did not provide sufficient information to identify the area of practice change (39% of producers), these were allocated to a practice change area according to the same proportions as those producers who did indicate a practice change area. The practice change areas, along with the proportion of 'BeefUp' participants intending to make a change in each area is provided in Table D2.

As for the 2019 assessment of 'BeefUp' impact, the current impact assessment has also used case study data from the More Beef from Pastures Program to quantify the economic value of practices made across relevant practice change areas. MBfP case study data was updated for the current impact assessment to reflect changes in practice change areas, costs and income. As with the 2019 assessment, an additional weighting was applied to reflect differences in scale of operation of the case study participant farms compared to the average of the 'BeefUp' participants. This was applied because it was considered that these case study farms did not represent the average net benefit that the 'average BeefUp' participant would receive per head. For example, the average number of animals for 'BeefUp' participants was 2,575 head/participant whereas the case studies ranged from 152-2,500 head/case study. To account for this over estimate, the net benefits have been weighted using a ratio of average 'BeefUp' herd size to case studies herd size for each practice change area (Table D2).

Table D2: Estimates of impact for 'BeefUp' using estimates from 'More Beef from Pastures' case studies and one case study from 2019 'BeefUp' interviews

Practice Change Area	Av Net Benefit per head*
Business management	$ 4.07
Feedbase	$ 4.72
Beef reproductive efficiency	$ 4.60
Animal wellbeing	$ 1.94
Marketing	$3.72
Genetics	$3.35

*Estimates made from 'More Beef from Pastures' practice change case studies and one 'BeefUp' 2019 case study adjusting for herd size ratio and expressing in 2020/21 $

The producer surveys completed in 2019 provided the following information regarding attribution:

- 47% said the workshop provided enough information and skills to implement the practices they tried, 41% said it partly helped
- 12% said it did not provide enough information and skills to implement their change
- 88% sought additional information to that provided at the event
- 71% thought the workshop was the most important source of information/skills for implementing change
- 24% said they would have made the change at the same time and scale without the workshop

- Of those that would have still made the change without attending the workshop, 64% felt they would still have made the same amount of profit as they did by attending. No respondent gave a response to how much less they would have made without the workshop.

In the absence of any new survey data, the 2019 data has also been used for the current impact assessment.

The values for benefit per head in Table D2 have been adjusted to account for the extent to which participation in 'BeefUp' provided the information required to implement change and the influence of 'BeefUp' in achieving better results than would otherwise have been achieved had the same change been made anyway (Table 3). Using business management as an example, as indicated in Table 2, average net benefit in the 'with investment' scenario is $4.07 per head. While a proportion of participants interviewed in 2019 who did adopt improved practices after attending a 'BeefUp' forum reported they would still have made the same change at the same time and scale had they not attended the forum (24%), a proportion of these producers (25%) also reported that they were able to achieve a better outcome due to attendance at the forum than they otherwise would have (10% higher profit per head reported in 'counterfactual' section above). For these producers, the counterfactual profit per head is calculated as 90% of $4.07, or $3.66 per head. Thus, a benefit equal to the difference between the 'counterfactual' and the 'with investment' benefit per head of $0.41 ($4.07-$3.66) is also attributed to the 'with investment' scenario for these producers.

After allowing for the proportion of producers who would have received a lower profit in the counterfactual and the timing of adoption for these producers, the additional average net benefit per head due to a higher benefit in the 'with investment' compared to counterfactual for these producers averaged out over all adopters at $0.06 per head.

Thus, the overall net benefit of adoption is calculated as $4.13 per head ($4.07+$0.06).

However, this figure assumes that everyone that has made a change did so based only on information and skills gained through participation in 'BeefUp'. Based on the 2019 interview data the net benefit was discounted to reflect the following:

- 47% of participants gained the information they needed to make the change from 'BeefUp' so 47% of the benefit was retained at $4.13
- 41% of the benefit was discounted by 50% ($2.07) to account to for 'BeefUp' partially helping with providing enough information and skills to make the change
- 12% of the benefit was discounted by 90% ($0.41) to account for participants that said they needed to seek additional information to implement their change.

*With these considerations, the net benefit for adoption is **$2.84** (47% of $4.13+ 41% of $2.07 + 12% of $0.41) per head.*

Table D3 shows the adjusted net benefits for each practice change area as calculated above to take into account the counterfactual and attribution.

Table D3: Adjusted net benefits/head for each impact area

Practice Change Area	Adjusted Net Benefit/Hd
Business management	$ 2.84
Feedbase	$ 3.30
Beef reproductive efficiency	$ 3.22
Animal wellbeing	$ 1.35
Marketing	$ 2.60
Genetics	$ 2.34

Additional Unquantified Benefits

The 2019 producer surveys also revealed that 'BeefUp' forums provided the following additional benefits to participants:

1. **Sign posting to other events:** 33% of participants interviewed said they had been prompted to attend other events such as other 'BeefUp' forums, 'EDGEnetwork' courses, one day workshops and field site visits etc.
2. **Felt more in control/less stress**: 15% of participants interviewed reported that the changes they made enabled them to feel more in control or less stressed.
3. **Safer work place:** 5% of participants interviewed reported that their changes contributed to a safer work place.

Impact Risk Assessment

The greatest source of variability around the estimates of impact are:

1. Season and whether the season is considered 'poor' (low rainfall, low feed supply) or 'good' (higher rainfall, better feed supply). While it is impossible to know the impact of poor or good seasons on these factors, it was assumed this would impact on costs of feed and fertility.
2. Market prices and the impact they have on decision making i.e. if prices rise, previously unattractive options (opportunity feedlotting or trading, capital investment in infrastructure that has a slow rate of return) become more attractive, whereas when prices fall (and costs remain the same or increase), there is a reduction in profit and little to reinvest in new ideas/technology/infrastructure.

To assess the likely range of variability around impact estimates, a best case and worst case scenario were modelled with likely variations in production and prices. The results shown in Table D4 are the weighted averages of case studies in each impact area.

Table D4: Best case/worst case risk scenarios*

Practice Change Area	Best Case	Worst Case
Business management	$ 4.85	$ 3.33
Feedbase	$ 8.93	$ 1.62
Beef reproductive efficiency	$ 7.80	$ 2.56
Animal wellbeing	$ 9.65	$ (1.70)

Marketing	$ 8.00	$ 1.15
Genetics	$ 5.95	$ 2.01

*Estimates made from 'More Beef from Pastures' and 2019 'BeefUp' practice change case studies updated and with herd ratio applied.

Adoption (what is the expected adoption and how has this been measured)

As noted above, 'BeefUp' M&E from the four events being assessed indicated that 52% of producer participants that completed exit surveys intended to make a change post event. Phone surveys of 554 producers conducted for the Majority Markets Program review indicated that 75% of those producers who indicated an intent to change in post event surveys actually ended up making the change (Howard *et al*., 2014). In the absence of any follow-up data to determine actual compared to intended change for 'BeefUp' participants, this finding has been applied for the current impact assessment, resulting in an assumed adoption rate of **39%** (52% x 75%). This is very similar to the adoption rate of 43% for the 2019 impact assessment of 'BeefUp' based on producer surveys.

Based on survey data collected for the 2019 impact assessment of 'BeefUp', it has been assumed that adoption was 100% on a whole of farm scale for this analysis.

The proportion of attendees at the four events being assessed who were not farmers was 27% and consisted of consultants, stock agents, researchers, extension officers and 'other'. Their influence on adoption has not been able to be quantified in this analysis so is assumed to be negligible. The logic is that although they may share information with producers from 'BeefUp', this information is at best a trigger or a prompt for the recipient producer to follow up with other advice/information and thus not directly attributable to 'BeefUp'. Further evaluation of non-producer participants would be needed to make accurate assumptions.

Calculating units of adoption

Using the data recorded from post event surveys, units of adoption were calculated using the following steps:

- Base number cattle = 597,359 for 232 producer participants - this was assumed to be the maximum potential number of units for adoption for the program (non-producer participants were removed from the analysis).
- It was assumed that adoption would occur in the year following event attendance for 50% of producers and in the following two years for the remaining 50% of producers (25% each year).
- The number of participants that would have made changes anyway had their cattle removed.
- The participants that would have made change on the same scale and later had their cattle removed later in the adoption curve to reflect delay in adoption (average of 1.5 years later).
- The participants that would have made the change on a smaller scale had half their cattle removed.
- The participants that would have made the changes later and on a smaller scale had half their cattle removed later on to reflect delay in adoption.
- A 5% decline in adoption per year was applied after 10 years to account for producers moving out of the industry or adopting new technology.

These assumptions are consistent with those used for the 2019 impact assessment of 'BeefUp' based on producer phone survey findings.

The 'BeefUp' adoption profile is presented in Table D5.

Table D5: Adoption profile for 2021 'BeefUp' Forums (No. cattle)

Year	# Head – Business manage-ment	# Head - Feedbase	# Head – Beef reproductive efficiency	# Head - Animal wellbeing	# Head - Genetics	# Head - Marketing	Total # Head
2021-22	1,771	32,224	8,587	1,239	44,353	354	88,529
2022-23	2,237	40,705	10,847	1,566	56,025	447	111,826
2023-24	2,912	53,001	14,124	2,038	72,949	582	145,606
2024-25	2,563	46,641	12,429	1,794	64,195	513	128,134
2025-26	2,493	45,369	12,090	1,745	62,444	499	124,639
2026-27	2,423	44,097	11,751	1,696	60,693	485	121,144
2027-28	2,423	44,097	11,751	1,696	60,693	485	121,144
2028-29	2,423	44,097	11,751	1,696	60,693	485	121,144
2029-30	2,423	44,097	11,751	1,696	60,693	485	121,144
2030-31	2,423	44,097	11,751	1,696	60,693	485	121,144
2031-32	2,302	41,892	11,163	1,611	57,659	460	115,087
2032-33	2,187	39,797	10,605	1,531	54,776	437	109,333
2033-34	2,077	37,807	10,075	1,454	52,037	415	103,866
2034-35	1,973	35,917	9,571	1,381	49,435	395	98,673
2035-36	1,875	34,121	9,093	1,312	46,963	375	93,739
2036-37	1,781	32,415	8,638	1,247	44,615	356	89,052
2037-38	1,692	30,794	8,206	1,184	42,384	338	84,600
2038-39	1,607	29,255	7,796	1,125	40,265	321	80,370
2039-40	1,527	27,792	7,406	1,069	38,252	305	76,351
2040-41	1,451	26,402	7,036	1,015	36,339	290	72,534
2041-42	1,378	25,082	6,684	965	34,522	276	68,907
2042-43	1,309	23,828	6,350	916	32,796	262	65,462
2043-44	1,244	22,637	6,032	871	31,156	249	62,189
2044-45	1,182	21,505	5,731	827	29,599	236	59,079

Limitations to Analysis

Limitations to this analysis have included:

1. Incomplete survey data from 'BeefUp' event participants:

    - Not all producers who attended the four 'BeefUp' events assessed completed a survey post event (53% completed surveys).
    - Not all producers who completed the exit survey and indicated an intent to change identified the type of change intended (39% did not identify type of change).

As a result, the survey data that was obtained had to be extrapolated across all participants who did not respond to key questions.

2. No data was available from participants who attended the four 'BeefUp' events to assess actual adoption or attribution, thus previous survey data had to be used as an estimate.
3. The participant data from events did not allow for identification of multiple participants from the same business, thus adoption data will be an over-estimate.
4. No impact data was available from participants attending the four 'BeefUp' events being assessed, thus data from other sources had to be used as an estimate.

Bibliography

Howard, K.A., Beattie, L. and Graham, C. (2014) Assessing the Impacts of MLA's Southern Majority Markets Program – Final Report. Report prepared for Meat and Livestock Australia contract B.Com.031

Appendix

Table D6: 'BeefUp' consolidated data for participation at forums in 2021

No. Events	Event Date Range	No. of participants	No of producer participants	Total cattle	Av. Cattle/Participant
4	26/3/21 – 30/7/21	318	232	597,359	2,575

13.0 Appendix E: Observations regarding data generation, collection, collation, analysis, interpretation and reporting

The following discussion highlights the issues/problems encountered when utilising MLA's existing data sets for the impact analysis. It takes a systematic approach in looking at all steps in the data management pathway.

1. **Data generation**. Ensuring survey methods and questionnaires have been designed to collect the required data is the first step. The following was observed when assessing data generation for measuring impact:

    a. **Most products do not know what they need to report for impact**. For instance, most products were able to collect basic demographic data but had not designed data collection to gather information to identify participants from the same business (to reduce double counting of demographics for ha and livestock), identify 'what changes' participants were intending to make in enough detail to assign them to a practice change area or allow for data from evaluation to be linked to registration to enable meaningful follow up to occur[10]. Even the understanding of what type of demographic data is needed is low as most products are using historical data collection formats that have not been assessed for usefulness against current needs.

    b. **Methods of generating data vary and can be inadequate for impact evaluation**. For instance, 'BredWell FedWell' uses turning point personal 'clicker' technology to provide a fun interactive way to gather group data during the workshop that gives the presenter and participants instant feedback during the workshops and adds to the experience. It is inadequate however for gathering demographical data as participants can only chose one option rather than entering their own data. Similarly, they can record intention to change as a multiple-choice option, but not provide details as to what they intend to change that allows it to be meaningfully used. Lastly unless the presenter assigns a name to every clicker handed out, the results are anonymous so cannot be used for follow up purposes. Paper based evaluations can also generate 'tick and flick' (quick and less accurate) responses if not enough time or emphasis is given to allowing participants to put down genuine responses[11]

    c. **Questions asked on evaluation forms generate data that can be hard to interpret**. For example, 'EDGEnetwork' asks the question 'Do you intend to make a change or take action?' and follows up with a multiple-choice question asking what change or action they

[10] For meaningful follow up to occur with participants post event, need to be able to determine who the participant is (name, contact details, permission to follow up), what type of business they represent (beef/sheep, scale of enterprise), whether they intend to make a change and what change they intended to make. Participants also need to be 'stratified' for follow up meaning there needs to be equivalent representation of all property sizes, enterprise types, event categories etc.

[11] To generate more meaningful responses to 'what do you intend to change as a result of today's event/workshop etc' requires presenters to prime the participants with a process that gets them to think beyond the content of the day to 'how is the content useful to you' and 'what will you do with this information'. In general, most end of event evaluations collect too much data about event satisfaction/participant learning and not enough relating to how useful the event is.

intend to take with multiple responses allowed. This would be better as a single question that allows people to choose options and provide detailed action for later interpretation.

2. **Data collection.** Collection of participation data was problematic on a number of fronts. In general, the following was observed:

    a. **Most products count the number of participants.** They all do not however identify the non-producers from the producers and the number of businesses represented from the number of producers who attend. This means attendance figures are 'over inflated' when it comes to using them to attribute impacts as there are a % of participants who are either not producers or come from the same business. The only extension product able to identify #businesses from #participants was 'EDGEnetwork'. The extension products able to identify non-producers from producers ('BeefUp', 'MeatUp' and 'BWFW') did not count # businesses. 'PGS' may have collected this data but it was not able to be accessed during this assessment phase.

    b. **Projects varied in the collection of base demographics** such as #ha and #head and varied in the way they asked this question i.e. some asked for total # cattle/sheep, some asked additionally for # breeders and some asked for #lambs sold or #weaners/cattle traded. While it is acceptable for 'BWFW' to collect breeder # because that is the important demographic, the 'MeatUp' project was inconsistent in that it collected #head cattle and # breeder but only collected #ewes and #lambs sold rather than #total sheep. These figures additionally were collected per participant rather than per business and this posed problems for data collation, analysis and interpretation which will be discussed in those sections.

    c. **Participation demographics are often recorded at the end of event not at registration.** Collection of producer demographics at the end of the event as part of event evaluation causes issues as many participants leave early or the evaluation process is rushed resulting in less data being captured than is desired. While it is unrealistic to expect that every participant's details are recorded from events where 'walk-ins' occur i.e. 'MeatUp', 'BeefUp' and 'BWFW', this is not the case for 'EDGEnetwork', 'PGS' and 'PDS' where pre-registration is required to ensure the events go ahead.

    It is recommended that it be standard practice to collect participant demographics pre-event as part of the registration process to ensure that data is captured from as many people as possible and that this data is checked over prior to attendance to fill gaps and confirm details such as how many people are attending per business. With the new COVID requirements for participants at events to register their attendance, the capture of data and the cross reference of who has attended and who has not should become more routine as everyone accepts the need to register. The benefits of collecting this data pre-event also gives event organisers insight into who is attending in terms of enterprise mix, location, business size etc and coupled with questions about why people are attending and what they expect to get out of the event, will enable event organisers to run better, more targeted events.

3. **Data entry.** Data entry methods vary from online registrations to transcription of paper-based data to spreadsheets. Excel spreadsheets allow for the data to be statistically analysed and is preferred for the flexibility it allows for analysis. However not all spreadsheets were equal and some data entry templates created problems for later analysis. The following was observed:

    a. **Transcription from paper evaluations causing errors in the data.** For most extension products, participation and demographic data is manually transcribed from evaluation sheets to an excel spreadsheet. As far as could be ascertained, little is done to check data integrity after entry by calculating averages etc to check that the figures entered 'make sense' when compared with raw data. During this project the occasional anomaly was identified i.e. a figure seemingly too big/small compared to other data entered. Going forward, to improve data integrity and accuracy, all data entered ideally needs to be checked to pick up these errors before the source data (paper evaluations) are filed and/or disposed of.

    b. **Inconsistent data entry formats.** This creates errors in calculations when formats are changed from one data entry time to another. For example, in some data spreadsheets, when a producer did not have sheep, it was entered as a "0" or "-" or a blank cell in the spreadsheet. This becomes an issue when averages are calculated as they become inaccurate depending on how data is to be reported. Text entries such as 'Yes/No' can be abbreviated or entered with spaces which makes accurate collation of totals difficult because like entries are not picked up with formulas. While seemingly insignificant, these errors require correcting or 'cleaning' before meaningful data can be analysed and reported accurately.

    c. **Not all non-producers have no livestock**. Depending on the way this demographic was collected, some non-producers i.e. livestock consultants, stock agents etc, also have farms so for the sake of recording demographics and adoption, they need to be recorded as 'producers' with a side note that indicates their 'professional' occupation. This allows their data to be included in the participation and adoption statistics.

    d. **Blanks in answer to questions**. Data obtained from paper forms inevitably contain missing data e.g. # breeders entered but not #total head, or # ha. While some of this is unavoidable, in some cases, this data can be estimated from other responses. For example, if #breeders is entered but not #total cattle, the data can be entered as same as #breeders to at least provide an estimate of total cattle numbers.

    Data is entered as 'averages' rather than as individual entries per participant or business. In some products, data has been collated before data entry to provide averages rather than individual data entries per participant or business. While this seems to be a past practice for 'BeefUp' (this has been changed), it is important this does not occur again as it impacts on the ability to determine if the totals entered came from every participant who completed the survey or (more likely) only a proportion of participants who completed the survey supplying a response to that question.

4. **Data collation.** At some point, data needs to be collated for impact analysis data to be calculated. When this was done for this round of impact assessments, the following was observed:

    a. **A number of extension products do not collate data between events in a meaningful way.** For example, some products have a separate spreadsheet for each event which allows for an event-by-event comparison but does not allow for an overall product comparison, nor running totals to be viewed after each event/reporting period. Leaving collation of all event data to the end of the project misses anomalies in data entry and misses the opportunity to make corrections to data generation/collection if it is found to be inadequate for program monitoring and improvement as well as reporting.

    b. **Data is collated but not standardised to ensure it can be analysed.** This is related to fixing data entry anomalies as mentioned above but also includes addition of other data such as event name, date, location and other defining categorisation such as delineation between northern and southern program delivery, event categories (e.g. feedbase, reproduction etc) and species (beef, sheep, goats).

5. **Data analysis**. Data analysis, rather than simply calculating statistics, is required to ensure data accuracy and integrity. The following was observed:

    a. **In some products, data has been collated but not analysed to provide relevant statistics such as counts, averages and sums,** or it has been only simply analysed rather than converted to percentages or analysed across categories to allow comparisons e.g. north v south, state by state, category by category or even to identify producers from non-producers and number of producers versus number of businesses.

    b. **Calculations such as averages, counts and sums are done but not checked to ensure they make sense.** Related to data entry anomalies above, sometimes the formulas are applied but as the data has not been analysed, mistakes in calculations are not identified such as averages including all participants or only the ones answering the question.

    c. **More complex analysis in not undertaken** such including number of responses to questions rather than assuming that every question has been answered by the same participants which impacts on the way total numbers are interpreted. This also includes assigning themes/categories to free text responses so that statistics can be calculated that relate to what type of change participants are intending to make e.g. 30% are going to pregnancy scan and 20% are going to condition score rather than simply, 50% are intending to make a change. The former is more useful for determining what kind of impact changes are likely to make.

6. **Data interpretation.** Interpretating data with underlying assumptions explained is essential to ensure that there is no misinterpretation of figures or misreporting. During data gathering, the following was observed:

a. **Totals and averages for ha and livestock numbers are reported without explaining how the figure was derived.** For example, products report a total ha figure for the event but do not account for participants that do not provide data or for any data corrections to ensure that participants from the same business are not double counted. In many cases, averages are reported per participant rather than per business. Total ha/# livestock should explain the reach of the program so assumptions must be made about missing data points such as averages/medians were provided for businesses that did not supply data to give a total that is more reflective of actual participation rather than what was gathered from evaluations[12].

b. **Percentages are calculated using the wrong total.** For example, if a question was asked regarding 'intent to change' and only 90% of people answered the question, the total for calculating the % who intended to change is the number of evaluations returned not number who answered the question (those that didn't answer should be listed as 'non-responses' to allow the statistic to be applied to total participation/number of businesses). Another example is where respondents are allowed to provide multiple choices in which case the total is still the number of evaluations received not the total number of choices made.

7. **Data reporting.** In a number of products, the data required to calculate impact may exist but was not reported in a way that allows it to be used from final reports or milestone reports. The following was observed:

a. **Figures were reported but without explanation on what they represented**. For example, as mentioned in point 5, a total ha figure is provided without explaining that the figure only includes the data obtained from evaluations returned rather than being an adjusted figure that represents total business participation using averages or medians to fill the gaps.

b. **Data was analysed but not reported**. For example, individual event data provided but not a collation of all event data or all event data was presented as an average without totals.

c. **Data in reports was not cross checked with its source**. For example, totals on one page of an evaluation report do not tally with totals on another. While it is human to make errors, all figures need to be checked to make sure they are accurately reported.

d. **Graphing formats did not allow for actual figures to be determined**. For example, a pie chart was presented to show breakdown of participation visually but it was difficult to determine how many participants were producers. This needs to be included in the text or tables to allow the data to be utilised by the audience of the report.

[12] As mentioned in data entry, more accurate demographic data with less missing data is likely to be obtained if this is collected 'pre-event' as part of a registration process rather than from end of event evaluation.

As part of recommendation 4, to appoint an MLA evaluation manager, the role could focus on the following activities to assist with addressing some of the issues highlighted above:

1. **Develop a streamlined data generation, collection, entry, collation, analysis, interpretation and reporting processes across products so that data is stored in the same or similar formats.** This will involve standardising data entry templates but also allowing for different products to customise the templates to suit their needs. It also includes developing procedures that project managers can apply to obtain the data required.

2. **Train and support project managers** to use the data templates to ensure that there is consistency in the way they are used and analysed and that project managers develop an understanding and appreciation for the value the data provides for continuous improvement as well as reporting.

3. **Test the integrity of data** and pick up on errors/anomalies to continuously improve evaluation data capture and use. This will provide a feedback loop that is currently lacking in the system to ensure data is meeting the needs for reporting impact as well as project performance.