Final report

Future Livestock Consultants 3

Project code: P.PSH.1189

Prepared by: Ben Reeve
Meridian Agriculture pty ltd

Date published: <Day, Month and Year - e.g.10 April 2015>

PUBLISHED BY
Meat & Livestock Australia Limited
PO Box 1961
NORTH SYDNEY NSW 2059

This is an MLA Donor Company funded project.

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government to support the research and development detailed in this publication.

Abstract

The Future Livestock Consulting 3 Program built on the success of two previous programs, with the objective to introduce 10 new livestock consultants to the sector who were confident and competent in assisting red meat producers. See: MLA what we do – Rural Professional.

The two-year program was designed to meet the program objectives, however faced significant challenges to the implementation due to the restrictions forced by the COVID-19 pandemic. The program, which heavily focused on group development and support through a collegiate cohort and supportive network, was largely restricted to interaction via teleconferencing due to the nationwide spread of participants. As a result, the program was altered to prioritise training opportunities and relied on an increase of activity to develop the support networks required. This support was aided through interaction with Alumni and MLA staff. In addition to training activities, the participants conducted group projects in order to work together, and regularly reflected on skill sets relevant to their successful career as a livestock consultant.

30% of participants maintained ongoing employment with their employer post program, while 90% maintain a commitment and engagement to a career in the red meat sector. Participants reported a nearly 69% overall increase of confidence in the skills required to both operate and further develop a career as a livestock consultant and successfully assist red meat producers.

Executive summary

Background

Future Livestock Consultants 3 (FLC3) aimed to address the issue of a decline in extension service delivery, stimulating the private sector to grow and meet the needs of red meat producers.

FLC3 builds on the success of two previous programs each operating as the "Livestock Consulting Internship". Introducing 10 new livestock consultants to the industry nationally per program, the network of program graduates increases to 29 at the conclusion of FLC3.

Objectives

The objectives of the program were to:

- conduct a scoping study to define the program objectives and design the program itself.
- recruit 10 employers, 10 interns and implement the two-year program.
- undertake an appropriate evaluation of the program.

Results/key findings

Results of the program were:

- a two-year program delivered for 10 employers and participant interns.
- a program that required significant and ongoing alterations to account for state-based travel restrictions due to the COVID-19 pandemic.
- 30% have maintained employment with the participating employer. 70% of participants have transferred into new roles post the program. Although not a new phenomenon, the rate of change is higher than previous programs.
- 90% of participants maintain an ongoing engagement and commitment to the red meat sector.
- participants reported a nearly 69% overall increase of confidence in the skills required to both operate and further develop a career as a livestock consultant and successfully assist red meat producers.

Benefits to industry

Based on the feedback provided by employers and interns through post program reflections, high engagement with the adjusted program through increased webinars and training sessions, has seen 90% of the participants remaining in the red meat industry. This ongoing commitment provides strength to the industry with individuals engaged through the supportive collegiate environment and direct interaction with MLA staff. In addition, the altered program fast tracked the introduction and interaction with previous FLC participants, enhancing their support network, while motivating the LCI Alumni.

Future research and recommendations

Based on the feedback and anecdotal evidence from FLC3, the following key learnings are recommendations for similar programs.

- Although previous programs have focused on developing a collegiate group environment as a priority, a focus on training activities first will provide focus and intentionality for the group, while the group development can follow the typical lifecycle of a group.

- Focus future participation on those committed to industry and livestock consulting as a career. Although hard to define, the FLC3 program cohort were intentionally younger and hence more likely to change career and personal focus than those older and established in the industry.

- An ongoing approach to increased interaction with established alumni would aide in the development of future industry projects, general collegiate support and encouragement as well as presenting the opportunity for alumni-based events where MLA can have direct interaction with all current and past participants.

Table of contents

1. Background

Future Livestock Consultants 3 (FLC3) aimed to address the issue of a decline in extension service delivery and to stimulate the private sector to grow and meet the needs of red meat producers. The Education Pipeline review (Stephens, et al, 2013) identified human capacity as one of six major challenges for the red meat industry. In relation to extension professionals, the review recommends preparing and nurturing graduates for influential extension roles by providing mentoring and professional development opportunities.

The MLA Strategic Plan 2020 identified an opportunity for increased provision of services by the private sector supported by industry. FLC3 strategically addresses an issue of extension service delivery decline by stimulating the private sector to grow and meet demand.

FLC3 builds on the success of programs FLC1 (P.PSH.0683) and FLC2 (P.PSH.0842) each operating as the "Livestock Consulting Internship". Introducing ten new livestock consultants to the industry nationally per program (9 participants in program 1), the network of program graduates increases to 29 at the conclusion of FLC3.

2. Objectives

The objectives of the program were as follows:

By December 2019:

- Conduct a scoping study to define the Cohort 3 professional development program.
- Deliver a refined program plan, budget and M&E plan based on stakeholder consultation and learnings for FLC 1 & 2 for a two-year future livestock professional development program.
- Recruit 10 employers.

By December 2021:

- Implement and evaluate a two-year capability development program for 10 interns.
- A minimum of 10 media opportunities (press releases/articles) published in publications such as Feedback, newspapers and/or social media.

2.1 Achievement of Objectives

2.1.1 Scoping Study

The scoping study was undertaken to develop the foundation and design of the LCI3 program. This process was undertaken in the following steps:

- A broad overarching survey with a range of employers and interns from previous FLC programs reviewing their experience in the program, identifying aspects to either retain, improve, or remove from program design. Respondents were encouraged to reflect on their experience and consider the needs of consultant, business and industry moving ahead.
- The broad feedback from surveys was refined into key topics or challenges the FLC3 program needed to address.
- Semi-structured interviews with a select range of employers and interns from previous FLC programs was then used to verify the key issues and also seek guidance on how to address

these via the program design. This feedback considered the realistic needs of both employer and intern participants.
- A model was developed and presented to the same employers and intern participants interviewed for feedback.
- After edits, the model was presented to MLA as the preferred model and outcomes seen in Appendix A.
- This model was used as a foundation for the development of the LCI3 program.

2.1.2 FLC Program Plan

A defined program plan was delivered as found in appendix B to address the outcomes defined in the scoping study.

Due to Covid-19 pandemic, the program plan was revised where possible to address state and federal travel-based restrictions, as well as the impact and changing needs of participants work schedules. The revision of delivery plans occurred numerous times over the two-year program.

2.1.3 Recruit 10 Employers

Expressions of interest were sought from suitable businesses to participate in the program. An employer information pack was developed and released to businesses that either expressed an interest in participating through a) previous participation or expressed an interest in applying for a FLC program direct to Meridian Agriculture, b) registering interest with Meridian Agriculture in participating in future programs, or c) had direct contact with MLA regarding their interest to participate. As a result, 30 businesses were made aware of the opportunity to participate in FLC3. Expressions of interest were received from 13 businesses to participate. Representatives of MLA made the final selection based on the expressions of interest received.

The appointment of interns varied for each chosen business. Some businesses had a recently appointed employee who agreed to participate as an intern. Others undertook independent recruitment campaigns to recruit a suitable person, outlining the requirements to participate in the program. In addition, program managers developed an advertising campaign using LinkedIn, university job boards and Seek.com ads placed in regions of employers who needed an employee. As a result of the Meridian Agriculture recruitment campaign, 101 applications were received, 15 shortlisted based on skill set and suitability for the requirements of the businesses with vacancies. Applications were passed onto each suitable business, and they independently undertook an internal interviewing process, with ongoing support and/or advice from program managers as required.

Table 1 outlines the 10 originally recruited employers. Some changes to the employers have been noted. All ten businesses were approved by MLA and interns were either sourced directly by the business or through the assistance of Meridian Agriculture.

All 10 interns were made aware of the program structure and what they were committing to.

Table 1 – FLC3 Employers and Interns

Employer	Intern participant
Brennan Mayne Agribusiness	Harriot Dunne
Bush Agribusiness	Karissa de Belle
Outcross Agriservices	Peter Brooker

Agripath	Anabelle Ottery
Sally Martin Consulting	Samantha Moorfield
Craig Wilson and Associates	William Sullivan
Holmes Sackett > Aggregate Consulting *	Courtney Cheers
Meridian Agriculture	Laura Forward
University of Adelaide in partnership with South Australian Livestock Consulting	Emma Peters
BOS Vet and Rural > Impact Veterinary Services**	Joanne Connolly

**During the program, the employer Holmes Sackett split into two new businesses. One business, Aggregate Consulting, continued the relationship with the program maintaining the same role, supervisor and industry focus as was with Holmes Sackett.*
***Within six months of the program commencing, the intern left the employ of BOS Vet and Rural, returning to Queensland. The intern maintained her involvement with the program and taking on the role of employer as a self-employed sole operator. The Meridian Agriculture program manager (hereby referred to as the "Program Manager") provided additional support in the role of mentor and coach throughout the inception and early stages of the intern's business development.*

2.1.4 Implement and evaluate a two-year capacity development program

The program plan, dates, schedule and content were implemented and commenced in February 2020, based on the scoping study (See Appendix A for guiding principles). The initial plan of meeting each intern and employer face to face at their place of work occurred for seven out of ten interns, with the other three conducted via video teleconferencing for efficiency or time availability.

The ability to fulfil the complete program plan was hampered by the Covid-19 pandemic, affecting both the implemented design, program activities and impact on participants.

Evaluation of the program occurred via a series of participant surveys and personal feedback.

2.1.5 A minimum of 10 media opportunities

Due to limited number of interactions with both intern participants and employers on a face-to-face basis and the increased nature of zoom based training sessions, 10 media opportunities were not sought or published by December 2021.

3. FLC3 Program

3.1 Program Design

3.1.1 Initial Program Design

The initial program design maintained elements of the FLC1 and FLC2 programs for both employer and intern participant, yet several new additions were embedded in the design of FLC3. Table 2 outlines the elements featured in the program design. The program design by time and group life cycle can be found in Appendix B.

Table 2 – FLC3 Program Elements

	For Employer	For Intern Participant
Existing in program design from FLC1 & FLC2	▪ A two-year program where an intern works within the business undertaking a suitable role and developing the skills in order to become a credible and experienced livestock consultant for client based and project type activity. ▪ Active involvement in the development of the intern, through planned program activity, developing support networks with other employers, the program managers and MLA. ▪ Quarterly webinars with other employers and program managers to discuss progress, issues, achievements and opportunities for the group. ▪ A regular subsidy towards the salary of the intern	▪ A two-year placement within an established and reputable livestock consulting business. ▪ Participation in six retreats across the two years with fellow interns. ▪ Develop nationwide networks that provide a foundation for a long-term career in the red meat industry. ▪ Develop a collegiate supportive relationship with other interns, participating employers as well as build relationships with participants from past program. ▪ Identifying, developing and implementing a research project with industry support.
New elements added in FLC3 program design	▪ The development and accountability of a formalised skill development plan for the intern (guided and facilitated by the Program Manager). ▪ Empowering the intern to undertake 20 days experience in another business through a secondment program. ▪ Participation in a two-day HR workshop to develop relationships with all other employers, interns, program managers and key MLA representatives; as well as develop key skills in order to appropriately manage the intern through the two-year program. ▪ Two webinars with all employers and interns to discuss relevant	▪ A supported and strategic skill development plan to focus on developing the skills required to be a livestock consultant, tailored for each intern. ▪ A group based formal training program delivered by The University of Melbourne as part of the Professional Development Modules in Agricultural Extension.

	matters and overall program progression ▪ Opportunities to share industry knowledge and experience with the intern group.	

3.1.2 Impact of Covid-19 and Refined Program Activities

The impacts of the Covid-19 pandemic on the program were catastrophic on the ability of the FLC3 program to fulfil its key objectives through the planned program activities.

A refined program was approved in April 2020 with fortnightly online activity undertaken, with a focus on continuing the building of relationships between the intern participants and undertaking training that was possible via teleconferencing.

2020 Speaker sessions were held as follows:

- Jim Shovelton – Meridian Agriculture – Critical Thinking
- Ken Solly – Solly Business Consulting – Consulting skills and running a consulting business
- Jum Lamont – Jump Start Communications – Communicating and working with the media
- Sharon Honner – Spectra Coaching – Group Facilitation skills, including online groups
- Lu Hogan – University of New England (& SALRC) – Career summary and insights from her experience

Several training aspects of the initial program design were initially withheld with the hope to undertake them face to face in 2021. Yet the ability to get participants (from five different states of Australia) together was negated by the associated travel and interaction restrictions, limiting the participants to meet only once face to face in the second half of the program. See Section 3.2 for more details.

Feedback received from the interns was that the fortnightly online sessions were too frequent and caused challenges with their workload, so the design from October 2020 onwards was to reduce the online training sessions to once a month. Revised planning for the second year of the program saw the development of three contingency plans (A, B and C). Plan A with limited travel restrictions and no quarantine requirements, Plan B with state-based outbreaks and resulting restrictions, and Plan C – A combination of both. (See Appendix C for all three plans). The Omnicron outbreak in late May 2021, resulted in all but one face to face meeting to be initially postponed, but then cancelled in favour of more online sessions. Regardless, the focus on the decided training activities remained the focus for ensuring all areas could be delivered. Table 3 outlines the content delivered in the 2020 year (year one) and the content to be delivered or expanded on in 2021 (year two).

Table 3 – LCI3 Training Content review for delivery in 2021

Purpose	Content covered	Content to be expanded on	Content not yet covered
Getting to know each other	Industry Project teams	Industry Project teams Group Dynamics Teamwork	VARK Learning Styles

Getting to know MLA	MLA Industry Funding Design Led Thinking	MLA Industry role and key people	
Getting to know you	DISC profiling	Intern interactions with employers	Mental Health Understanding your values
Developing Consulting Skills	Media Skills Personal experiences and tips Personal experiences and tips Group Dynamics & Facilitation Critical Thinking Skills	Analysing data Group Dynamics & Facilitation Employer HR Skills	Presentation Skills Innovation Industry Disruptors Change Management Financial literacy and farm economic analysis– UM study

2021 Speaker sessions were held as follows:

- Bill Malcolm & Alex Sinnett – University of Melbourne – Farm Business Economics
- Jill Rigney – The Right Mind – Personal Development, Mastery and Conflict Management
- Danielle Reeve – Lorem.Co – Understanding Mental Health
- Sally Martin, Elke Hocking and Andrew Speirs – All FLC3 Employers – Consulting Skills and sharing experiences.

In addition, MLA Manager Director Jason Strong shared with the interns at the online graduation ceremony.

3.2 Retreat Activity

The face-to-face retreat was held in Sydney in May. The three-day retreat focused on a number of activities. Including getting to know more about MLA, meeting key personnel, understanding their roles and the future opportunities within. Considerable effort was placed on the development of teamwork and getting to know each other more. In addition, a presentation skills workshop was conducted by Ann Burbrook of Concise Communications. The agenda for the retreat is found in Appendix D.

The retreat was successful in significantly developing the bonds and connection between interns, increasing the motivation to work together and the developing firm foundations to build upon for the remainder of the program. Although frustrating for program managers, MLA, the employers and interns that it took so long to eventuate; the outcomes from the evaluation (found in Appendix E) proved to be worthwhile for the interns and for the development of stronger relationships with MLA personnel, strategy and their interaction with consultants.

3.3 Skill Development Plans

Skill Development Plans were developed with all interns, with seven developed via face-to-face interaction and three via online video conferencing. The intention of these meetings was three-fold.

(a) To introduce both Ben Reeve and Meridian Agriculture as the LCI program managers, creating a trust-based relationship with the interns and starting the process of coaching and external support before meeting with other interns.

(b) To develop an understanding of what employers expect of the intern as their employee, based on the skills to be developed and experiences to be sought, as identified by the employer; and

(c) To start to formulate the Skill Development Plan to be actioned over the two-year program including four weeks placement with other businesses or organisations.

It was encouraged that each business and intern consider utilising another participating business within the internship program for at least one of the secondment placements. This would ensure the relationship and networking between employers occurred in addition to the expected intern interaction.

The intention was that employers would get to know each other and understand the capabilities and opportunities within other businesses at the first retreat. Due to the first retreat not going ahead as planned in March 2020, and many interns expecting to travel interstate for placements, the Skill Development Plans remained in draft format until travel restrictions eased. The plans were reviewed in January 2021 and where possible were actioned with some secondments and individual skill development noted through intentional training activity (by either employer or FLC3 program) or by simply spending time in the role undertaking he task, increasing both efficiency and competence naturally. The Skill Development Plans are not attached to this report due to the personal nature of the content for each participant. However as outlined in section 4.3 of this report, all intern participants have demonstrated steady growth in the key areas identified. All ratings are from both self-reflection and feedback from employers using a common rating scale.

3.4 Group Project

The group-based industry projects were to be focused on adoption, include a social research aspect and could also potentially include PDS activity. The group project process commenced August 2020 and interns worked in their groups until the end of the internship program (Oct 2021). Each project group was supported by an MLA representative in a mentoring capacity. This increased the interns direct networking within MLA and providing opportunities for:

- A direct contact for future project activities; and
- To work together as part of a group, encouraging the collegiate activities of the group.

Interns participated in a Design Led Thinking training session with MLA's Michael Lee and Clara Bradford. This formed the basis for understanding how MLA approaches project design. Interns then held a session identifying key issues across the industry, brainstorming industry problems and sharing with each other. This session was very well received by the group resulting in significant energy placed into the projects. The key issues identified were then refined back to six options for interns to consider and rank as to their preference for an industry project. As a result, three groups were created for three different project topics. All but one intern received their first choice for a topic (and that person got their second preference).

Table 4 outlines the industry project title and the working groups. With the support of an MLA mentor, each group used the design led thinking process to apply the principals to the problem at hand. Intern project groups worked on clarifying the problem they had identified, submitted a project proposal (including faux budget) and presented back their industry project findings to the group as well as submitted a project report. Each report can be found in Appendix F. The intention of the group project was to simulate the development of a project for MLA, identify the challenges of working in groups and undertaking project work in addition to their existing workloads. Although all

projects were completed, they were not accomplished as per their approved proposal. This was due to a number of reasons restricting their success including Covid 19 travel restrictions, reliance on other project partners (outside of the program) to collaborate, complete or approve the work, as well as some dysfunction, poor time management and communication within the project groups themselves. The learnings for each individual and group were therefore exceptional, and beneficial for reflection on the development of future projects and/or collaborative working groups.

Table 4 – Industry Project Topics and Groupings

Adoption Issue	Intern group members
Ag technology for data capture, record keeping and data storage – is there an ultimate package?	Karissa de Belle Anabelle Ottery Harriet Dunne Joanne Connolly
How can carcase feedback be utilised to change on farm practices to better meet market specifications?	Emma Peters William Sullivan Peter Brooker
How do producers best maintain and look after new sown pastures for persistence and resilience in the whole farm system?	Laura Forward Samantha Moorfield Courtney Cheers

3.5 Alumni

3.5.1 Alumni Conferences

Interaction with the already established 19 LCI graduates was considered important for the support and development of the younger LCI3 cohort. Again, due to the restrictions placed on the program activity, the intentional design and hosting of two LCI Alumni Conferences took place in December 2020 and December 2021 via videoconferencing. These conferences were not part of the initial program design, however the increased use and comfort with videoconferencing as well as a desire from the 19 previous graduates to interact with the LCI3 group was compelling motivation to facilitate the two events.

Both conferences included presentations from and interaction with the alumni of previous LCI groups. This gathering acted as both a conclusion to each year, but also increased the networking of the current intern group with now established livestock consultants who have been through a similar journey. The importance of the FLC3 intern cohort understanding that they are part of a bigger capacity building program and a supportive alumnus was important for developing the motivation for and resilience in a career as a livestock consultant.

3.5.2 Future Alumni Activity

Agreement between MLA and Meridian Agriculture has been made to utilise unused funds from the FLC3 program budget (that was initially forecast for retreat activity that could not occur) towards the development of an effective LCI Alumni. A committee has been formed with a participant from each of the first three programs to effectively design, manage and consider long term sustainable activity for the LCI Alumni. Funds will also be allocated to FLC3 participants to undertake intentional training

in MLA programs relating to the Carbon Neutral 2030 (CN30) and Northern Breeder Businesses (NB2) programs.

4. Program outcomes and Impacts

4.1 Commitment to red meat consulting careers

The activities undertaken in the FLC3 program aimed to increase the capacity of red meat consulting businesses by upskilling employees who have the capabilities, skills, and confidence to support an increased number of red meat producers. The nature of delivering a program that faced ever changing restrictions meant the continual evaluation and feedback from participants was key to ensuring the program itself was effective.

All 10 intern participants completed the two-year program, however the retention with the employer during the program has differed across the participants. Of the 10:

- Three participants (30%) have remained in the same role, continuing employment with the host employer.
- Three participants (30%) have changed career focus into an on-farm red meat production-based roles (although all state the desire to one day return to livestock consulting, claiming more experience on farm will aide their credibility).
- Two participants (20%) have changed career focus into agri-banking. Both with an agricultural production focus.
- One participant (10%) has changed career focus to a sales-based role focusing on livestock nutrition.
- One participant (10%) has changed focus and has decided to not pursue a career in agriculture.

90% of participants remain engaged in the red meat sector, although 60% have a different focus than that engaged throughout the program. Participants moving to new roles post the program concludes is not a new phenomenon, but the rate of change is higher than previous programs. One conclusion is the intentionally younger cohort have proven typical of persons in their early 20s who seek up to three career changes before they turn 30 (Burke, P., 2007).

The employment relationship between intern and employer plays a significant relevance to an intern remaining not only with the same career direction, but within their direct employ as well. The support provided to interns by the program managers anecdotally confirms that a strong established relationship is vital for long term success in maintaining engagement between employer and employee. See Section 4.4 for more detail.

Consideration must be placed on the effectiveness of the FLC3 program to solidify livestock consulting as a viable and credible career choice. The impact of COVID on the program design, resulting in an inability to undertake activities that solidify a collegiate atmosphere, a supportive cohort, and expansive network with LCI Alumni may have impacted on the overall retention rate of this program. Yet it cannot be concluded that the career of livestock consulting, influence of any participating employer or the LCI3 program itself. Participating interns have not been asked the direct question relating to these assumptions.

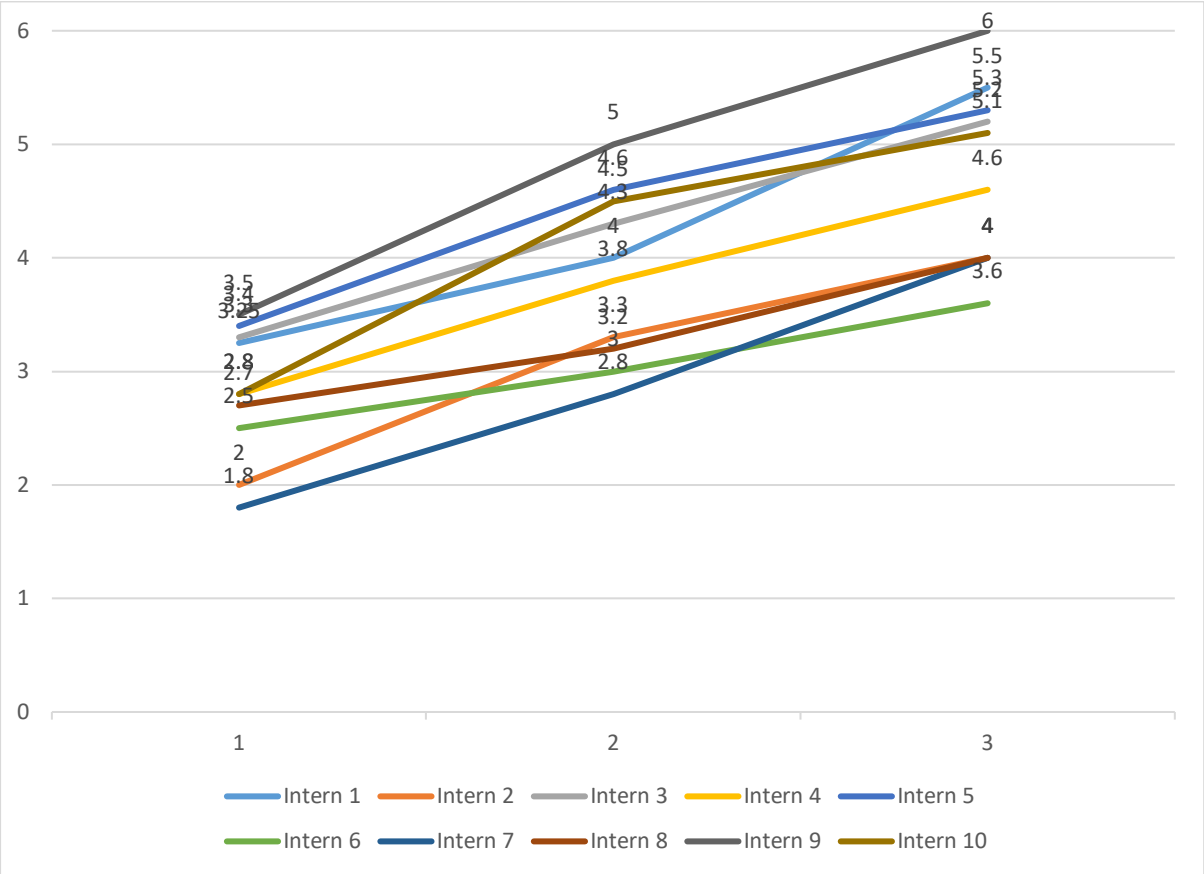
4.2 Engagement in Program Activities

Throughout the program, the active participation of the interns remained at over 80% for the duration of the two years. Participation rates in online workshops remained high, with most participants rarely missing a session. With an increased number of actual hours required for participation, the interaction with each other and the program activities demonstrated high engagement.

4.3 Skill Development Progression

Intern participants - with supervision and input from employers – were requested to self-rate individually relevant skills (to their role) on a scale of 1 – 6 (1 referencing no knowledge, skill or experience; to 6 referencing highly competent and working above industry standards). This self-rating occurred at the commencement of the program, at the midpoint and at the conclusion of all activities. Chart 1 outlines that each intern had an increase in the development of skills considered important to them over the two-year period. The agreed skills development increase is an average of 68.92% confidence in a variety of skills over the two-year period. Considering most interns were unable to develop these skills through the planned secondments, this continual improvement through employment or program activities is pleasing.

Chart 1 – Skill Development Ratings – Self Ratings (Averaged summary)



Participants have been intentionally de-identified.

4.4 Program Manager Intern Interaction

Over the course of the program, the interaction between Program Managers and interns for coaching and support has increased significantly compared to the programs before it. An increase is not unexpected due to the ongoing relationship and trust being built between Program Managers and each intern. Support has included one-to-one catch ups mixing from casual in nature, to reflecting on the work efforts and issues they are facing within the group projects, as well as issues with interaction with their direct employer/supervisor. Although not universal, some support has been provided to interns regarding high levels of dissatisfaction with their employment relationships, workloads or type of work undertaken. As a result, most interns sought support, advice and encouragement from Program Managers on the management and/or repair of this employment relationship.

It would be estimated that over 100 hours was dedicated to this support for interns over the two years, beyond that time expected in the development of skill development plans or as per the designed individual conversations.

In addition, several employers sought advice from the Program Managers on strategies for dealing with intern performance management issues. Again, this support has been provided in the previous two programs, yet because of the geographically remote nature of the relationships formed to date it has proven difficult to provide this support generally.

4.5 Final Session Feedback

During the final session of the program, participants were asked to reflect on their experience and provide some insights as to their personal highlights and challenges faced over the program. Diagrams 1 and 2 outline a variety of highlights and challenges faced. This variety is a reflection of the individual nature of the LCI experience, acknowledging that individuals value different aspects of the program and face individualistic challenges that affect their behaviour, attitude and commitment to the career or industry as a result.

Diagram 3 provides a one-word summary of the intern participant's experience. All words used by participants are positive and encouraging, while also reflective of their individual personalities and approach to the program.

Diagram 1 – Highlights

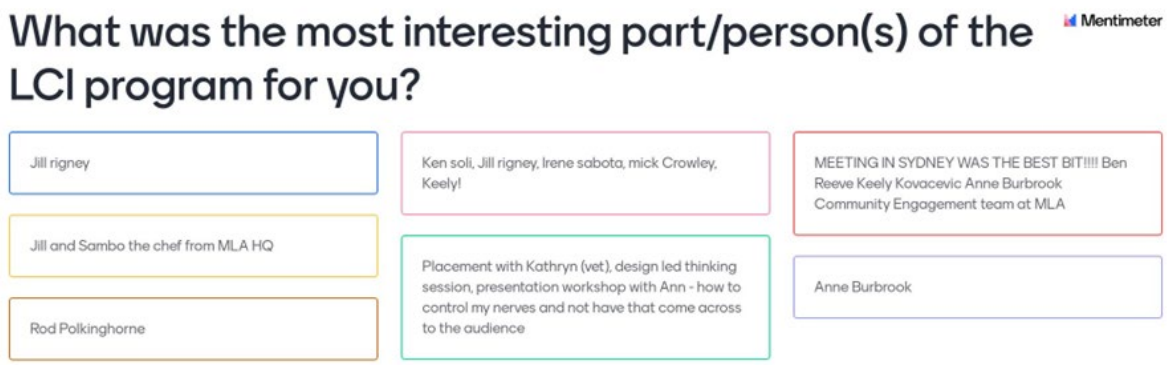


Diagram 2 – Challenges

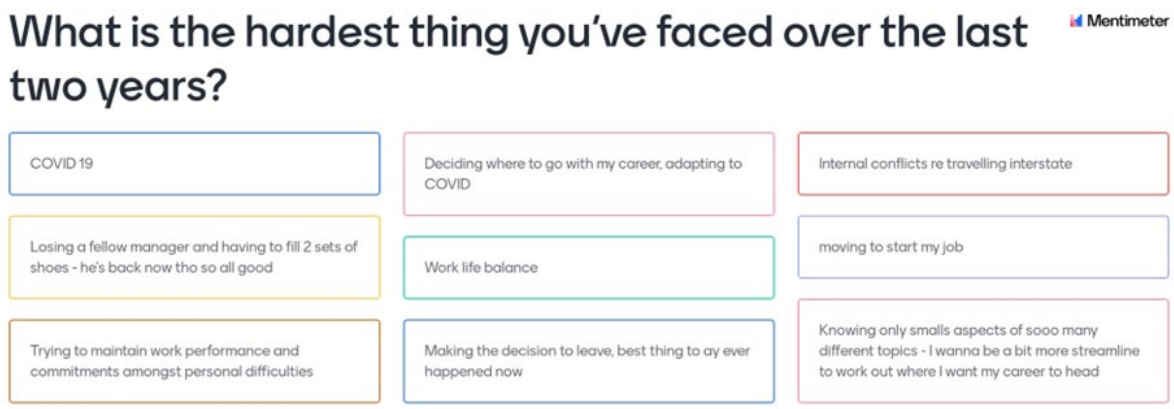


Diagram 3 – The LCI Experience summarised into one word

4.6 Participant Evaluation

Both intern and employer participants were requested to complete a short online survey relating to both the general program activities and general program value. The following tables provide a summary of FLC3 program satisfaction and value over the two years; and outlines a response or commitment as a result.

4.6.1 Interns

Feedback from the intern participants (9 respondents).

In Table 5 & 6, Intern respondents have outlined a positive experience participating in the program Respondents have acknowledged the impact of COVID 19 on the program design and limitations resulting. Regardless, they have communicated a high level of satisfaction with participating in the program, as well as value found in developing both the skills required for livestock consulting careers and the vital networks that support it.

Table 5 – LCI Program Satisfaction - Intern survey responses

	DISSATISFIED	SOMEWHAT DISSATISFIED	NEITHER SATISFIED OR UNSATISFIED	SOMEWHAT SATISFIED	SATISFIED	N/A
Personal support and communication provided by Meridian Agriculture personnel (if required)	0	0	0	3	**6**	0
Comments:	NA					
Communication from Program Managers Meridian Agriculture	0	0	1	2	**6**	0
Comments:	NA					
The quality of networks you've made (Interns, Employers, others)	0	1	2	**5**	1	0
Comments:	▪ The quality of the connections we have made has been fantastic. Just a shame that we were unable to extend those networks further due to COVID					
Adaption of program activities to abide by COVID19 restrictions	0	0	2	1	**6**	0
Comments:	NA					

Table 6 – LCI Program Value – Intern survey results

	NOT AT ALL VALUABLE		NEITHER VALUABLE OR NOT VALUABLE		EXTREMELY VALUABLE
Based on your experience, how valuable has this program been in developing your understanding of what it takes (skills, experience, approach, etc) to be a successful livestock consultant?	0	0	0	7	2
Comments:	▪ I now have an understanding of the skills needed and the rough timeframes for developing those				
Based on your experience so far, how valuable has this program been in developing your professional networks?	0	0	0	5	4
Comments:	▪ Opportunities to solidify/ extend networks were hindered by Covid and lack of face to face				

Table 7 provides valuable insight to the future commitment from the respondents to both the red meat industry and livestock consulting. Although some participants may have deviated from this career focus post program, this response does communicate a desire to return to the industry at some point in the future or an awareness they can participate in the industry with the appropriate skills and networks available to them.

Table 7 – LCI Program Personal Response – Intern survey results

	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE
The LCI Program provides me with opportunities to network wider than the business would otherwise	0	1	7	1
The LCI Program has provided the opportunity to develop the businesses employees career as a Livestock Consultant	0	0	4	5
The LCI Program has provided the opportunity to develop networks that assist in the interns career as a Livestock Consultant	0	0	4	5
I am committed to working long term in the red meat industry	0	0	1	8
As a result of participating in the LCI program, the intern's career as a Livestock Consultant has been fast tracked beyond what is would have been otherwise.	0	0	5	4

4.6.2 Employers

Feedback from the employer participants (9 respondents).

In Table 8 & 9, employer respondents have communicated a reasonable level of satisfaction of the program, outlining that it has also been valuable in their employees developing the appropriate skills and capabilities to add to their business.

Table 8 – LCI Program Satisfaction - Employer survey responses

	DISSATISFIED	SOMEWHAT DISSATISFIED	NEITHER SATISFIED OR UNSATISFIED	SOMEWHAT SATISFIED	SATISFIED	N/A
Personal support and communication provided by Meridian Agriculture personnel (if required)	0	0	0	3	**6**	0
Comments:	NA					
Communication from Program Managers Meridian Agriculture	0	0	1	2	**6**	0
Comments:	▪ Could have been more communication about program with interns					

The quality of networks you've made (Interns, Employers, others)	0	1	2	**5**	1	0
Comments:	▪ This would have been facilitated better through face to face networking opportunities, but given the restrictions, it still provided opportunity in this area. ▪ Networking with other firms is a great part of the program. Covid limited interaction for this program.					
Adaption of program activities to abide by COVID19 restrictions	0	0	2	1	**6**	0
Comments:	▪ Dealt with reasonably well given the circumstances.					

Table 9 – LCI Program Value- Employer survey responses

	NOT AT ALL VALUABLE		**NEITHER VALUABLE OR NOT VALUABLE**		**EXTREMELY VALUABLE**
Based on your experience so far, how valuable has this program been in developing your interns understanding of what it takes (skills, experience, approach, etc) to be a successful livestock consultant?	0	0	0	7	2
Comments:	NA				
Based on your experience so far, how valuable has this program been in developing the interns professional networks?	0	0	0	5	4
Comments:	▪ Limited by covid				

Employers have also outlined a long-term commitment to the red meat industry in Table 10, while also acknowledging the benefits of an employee fast tracking their career progression through the program.

Table 10 – LCI Program Personal Response - Employer survey responses

	STRONGLY DISAGREE	**DISAGREE**	**AGREE**	**STRONGLY AGREE**
The LCI Program provides me with opportunities to network wider than the business would otherwise	0	1	7	1
The LCI Program has provided the opportunity to develop the businesses employees career as a Livestock Consultant	0	0	4	5
The LCI Program has provided the opportunity to develop networks that assist in the interns career as a Livestock Consultant	0	0	4	5

As a business, we are committed to working long term in the red meat industry	0	0	1	8
As a result of participating in the LCI program, the intern's career as a Livestock Consultant has been fast tracked beyond what is would have been otherwise.	0	0	5	4

5. Conclusion

Based on the feedback provided by employers and interns, reflection by the interns during their final session, high engagement with the adjusted program of increased webinars and training sessions, and 90% of the participants remaining in the red meat industry; the FLC3 program was successful in its completion. Like the rest of the world, the impact of COVID 19 was significant in the development of relationships and the vital support structures underpinning the program design.

5.1 Key findings

- The FLC3 program, although impacted by the COVID 19 pandemic, did manage to fulfil the training elements incorporated into the program from the initial scoping study
- Travel restrictions and quarantine measures by state governments restricted the face-to-face activity between interns and employers to one key event. The design of the program to create a collegiate and supportive cohort through face-to-face events was therefore limited.
- A low retention rate of 30% of intern participants remaining with their employer cannot necessarily be attributed to the program or its amended activities, but the restrictions-based interns 'normal' work, employment relationships and the age of the cohort must also be considered (The 30% remaining with their employer are also the three oldest interns in this cohort).
- The interaction of LCI alumni with the intern cohort was imperative to building rapport and sustainability for a long-term career in both red meat production and livestock consulting more generally.

6. Future research and recommendations

Based on the feedback and anecdotal evidence from FLC3, the following key learnings are recommendations for future similar programs.

6.1 Training focus first, then group development

The restrictions placed on participants meeting face to face significantly limited the development of the group formation process in FLC3. All activity was intentionally designed around the forming, storming and norming of the intern group. This did not occur quickly, nor satisfactorily.

One key learning to be adopted for similar programs is the intentional focus on initial training activities to both fast track the learning of participants as well as emphasise the focus of the participants future activities. The group formation process should not be ignored; however, will be secondary to the training.

6.2 A cohort committed to the industry and livestock consulting

FLC3 intentionally attracted a younger graduate-based cohort of interns. This was a determination based on a varied FLC2 cohort and challenges it faced at times in creating the collegiate atmosphere within the group due to some age disparity. Yet the challenge of a younger cohort is similar to other job and industry sectors where younger people (20-30yrs) tend to change jobs and/or career focus more readily than those older. This was the outcome for intern participants in FLC3 with several moving to jobs outside of consulting, and one outside of agriculture.

Similar programs should aim for participants who have both outlined a career plan committed to red meat consulting and demonstrate a maturity to commit to the sector.

6.3 Interaction with LCI Alumni

The pandemic did present the opportunity for the FLC3 cohort to interact with previous FLC program cohorts via video conferencing. This occurred through the two “LCI Alumni” Conferences with past program participants sharing on their work and experiences to younger, less experienced consultants. An ongoing approach to increased interaction with established alumni would aide in the development of future industry projects, general collegiate support and encouragement as well as presenting the opportunity for alumni-based events where MLA can have direct interaction with all current and past participants.

6.4 Remain agile!

From a program delivery perspective, a key learning from delivering FLC3 was to adapt where possible to the pandemic related travel restrictions and availability of participants, guests and trainers. As program managers, the aim should be to remain as agile and flexible as possible to enable the content and activity to be delivered.

1. References

Burke, P. (2007). Forced Focus: the essence of attracting and retaining the best people. Messenger Publishing, Surry Hills, NSW.

Stephens, M., Hamilton, D., and Taylor, J. (2013). MLA Education Pipeline Review https://www.mla.com.au/contentassets/bc66677db6544f5782b43baa6581dde6/b.stu.0267_final_report.pdf

7. Appendix

7.1 Appendix A – Scoping Study

LCI Program Three – Proposed program design –

DRAFT FOR COMMENT - AS REQUESTED BY PROGRAM MANAGERS

Aims of LCI3:

We would like to see a set of interns that:

- Have a level of diversity in their thinking and approach to social, technical and environmental aspects of red meat production
- Will be people focused and have the skills or develop the skills to work with people.
- Will be navigation savvy - that is they are able to understand the technology available to industry and be able to provide the relevant information to producers on their relevant use
- Will need to be connected with and each other and the industry
- Will need to have a focus on coaching or an ability to challenge producers and be focused on delivery change
- Have a strong desire to create and drive change in the industry
- Have a desire to not stick with the status quo but deliver new programs, new outcomes and for the needs of the future of the industry
- Will need to be able to work with their competitors in a non-competitive space, understanding the limits of what can or can't be shared, yet work openly with others who maybe competitors in another environment. Understand and abide by Chatham House Rules
- Will need be advocates of MLA, MLA's programs and its activities and continually connect their internship with MLA.

We would like to see a set of employers that:

- Are dedicated to supporting the red meat industry
- Are committed to developing and engaged in seeing interns become the future of the red meat consulting industry
- Are supportive of interns thinking 'beyond' the business they are employed in, exploring ideas and driving change across the red meat industry

How will we see the above happen?

This will require a synergistic approach from employers, program managers, MLA and the interns themselves. The following table outlines the activities associated with aim.

Aim	How			
	Employer	**LCI Program**	**Intern**	**Other**
Have a level of diversity in their thinking and approach to social, technical and environmental aspects of red meat production	Through employment and mentoring, continually suggest interns look at the range of issues faced by the industry and seek opinions different to their own.	Through retreats, expose interns to a range of farming systems, industry leaders and people outside of ag who can help share insights.	Develop, interrogate and define their opinion on a range of issues affecting the industry.	Suggested readings, ted talks, guest speakers, etc.
Will be people focused and have the skills or develop the skills to work with people.	Through employment and mentoring, developing an understanding of the clients they mutually work with, and how to best work together.	Through retreats, develop an understanding of personality types, learning styles, appreciation of individual differences to vision, direction, values, etc.	Exposure to people different to them, developing a maturity to understand the value of diversity.	Have industry projects developed and undertaken as a group or 3 or 4. Suggested readings, ted talks, guest speakers, etc.
Will be navigation savvy - that is they are able to understand the technology available to industry and be able to provide the relevant information to producers on their relevant use	Through employment, suggest the intern explore and review various tools available to themselves and producers alike.	Through retreats or group hook ups, ask interns to share a tool or product they recommend to the group.	Maintain awareness to industry developments, new tools available and become aware of the potential.	
Will need to be connected with each other and the industry	Through employment, encourage connection with other interns and employers regularly. Suggesting they seek assistance from others to solve issues, broaden knowledge and develop a	Through retreats or group hook ups, facilitate activities to form bonds within the group and encourage interns to look at other networks they want to develop.	Be open to meeting new people, networking with industry and broader again. Encourage regular communication beyond formal program activities.	Encourage interns to attend events like Beef week, Lambex, etc together. Use the alumni of interns to build a sense of greater community where possible.

	nationwide industry approach.			
Will need to have a focus on coaching or an ability to challenge producers and be focused on delivery change.		TBC: Possibly a training session on coaching or will be developed through Use formal training?		Suggested readings, ted talks, guest speakers, etc.
Have a strong desire to create and drive change in the industry	Let interns explore beyond the status quo.		Identify core values that drive them to grow personally and professionally.	Identify areas of red meat production requiring focus in the future.
Have a desire to not stick with the status quo but deliver new programs, new outcomes and for the needs of the future of the industry	Let interns explore beyond the status quo.	Through retreats, create awareness of available MLA programs or other relevant programs as appropriate.	Encourage interns to seek out and hare of relevant programs, systems, etc that the group should know about.	
Will need to be able to work with their competitors in a non-competitive space, understanding the limits of what can or can't be shared, yet work openly with others who maybe competitors in another environment. Understand and abide by 'Chatham House Rules'	Through involvement with retreats and group hook ups; create relationships with each employer and intern in order to provide guidance and support as required. Operate and share with a confidence and trust that the content will be held in confidence. Operate knowing that openness and vulnerability	Through retreats and group hook ups, involve all employers and interns in open discussions on the development of the interns, mutual opportunities and industry related matters	Through involvement with retreats and group hook ups; create relationships with each employer and intern in order to provide guidance and support as required. Operate and share with a confidence and trust that the content will be held in confidence. Operate knowing that openness and	Ensuring external support and interaction with alumni happens to present a variety of opinions, experiences, etc.

	is mutual and expected of all.		vulnerability is mutual and expected of all.	
Will need be advocates of MLA, MLA's programs and its activities and continually connect their internship with MLA.	Create a personal awareness of relevant MLA programs and activities	Through retreats, introduce key MLA personal in order to develop both relationships and networks for future activity.		
Are dedicated to supporting the red meat industry	Actively involved with working with red meat producers as part of business activity.	Focus on red meat industry related production systems.	Actively involved with working with red meat producers as part of business activity.	
Are committed to developing and engaged in seeing interns become the future of the red meat consulting industry	Give interns opportunities to develop relevant skills and experience within their employment situation over the term of the program. Ask interns to report back on who they met, networked and interacted with during retreats, etc.	Through retreats, introduce key MLA personal in order to develop both relationships and networks for future activity.	Through retreats, take the opportunity to develop both relationships and networks for future activity.	
Are supportive of interns thinking 'beyond' the business	Give interns opportunities to develop relevant skills and experience within their	Giving all interns the opportunity share on issues from their	Through retreats, reflect on what they have heard, learned or experienced;	Ensuring external support and interaction with alumni happens to

they are employed in, exploring ideas and driving change across the red meat industry	employment situation over the term of the program in order to become senior consultants (or similar), or progress beyond the business where and if appropriate.	perspective, acknowledging that the interns my focus on different aspects of an issue within their business.	always considering the implications for industry and opportunities for development.	present a variety of opinions, experiences, etc.

Intern Activity

- Six retreats including a graduation ceremony at 2021 MLA AGM. Each will be between 2-4 days in length)
- Retreats held on the back of major relevant industry events (Beef Week/Lambex) where possible, limiting travel requirements for those who plan on attending these events
- Participate in group webinars every second month
- Regular individual hook ups with program managers to discuss any issues relating to employment, etc.
- Undertaking an industry project in a small group setting (with modest project funding provided)
- With guidance form employer and the program managers, develop a Skill Development Plan that must include four weeks placement/secondment experience in another business or organisation
- Assist in the running of the program through an intern representative, defining retreat agenda, and the running of the graduation ceremony.

Employer Involvement and Activity

- Work with program managers and intern to develop a Skill Development Plan (SDP) for the intern's two year development
- Release the intern to undertake four weeks of placement/secondment (This may be 4 X one week, 2 X two week or 1 X four week placements – dependent on what works for the SDP)
- Work with program managers and intern to develop a Skill Development Plan (SDP
- Participate in the opening retreat, including in a HR/mentoring workshop, building relationships with the other employers and all interns. This retreat will aim to establish a 'culture of trust' between employers and interns.
- Participate in the graduation ceremony and program wrap up
- Participate in up to seven group hook ups with employer group
- Participate in another two group hook ups with employers and interns

A Culture of Trust

Employers must be the leaders in driving a culture of openness and trust. The strength of the program is in the change and development occurs through vulnerability. This occurs through sharing and a trust that all are safe to do so.

The program acknowledges that businesses may be in competition with each other, but need to establish a code of conduct that drives a culture of trust within both employer and intern groups as well as across the whole program.

Skill Development Plan

In order to address the expectation of interns that livestock and consulting skills will be developed, the Program Managers will work closely with each of the participating businesses to develop a tailored Skill Development Plan (SDP). The SDP will have a 12 month review with the Program Manager and employer. The employer will need to demonstrate a path for development for the intern and its measurement will be part of the program evaluation process.

Industry Project

- Interns will participate in an industry project (like the previous two programs).
- The aim is to expose interns to the thinking, workings and
- The focus could be technical, could be future focused i.e. something that the industry will face in the future from 2022 onwards; or potentially design and deliver a PGS type project.
- A preference is placed for group projects (3-4 interns), however individual projects may be accepted, but will be the exception rather than the rule. There will need to be exceptional rigger and a high level of innovation to the project should they be undertaken individually.
- A independent mentor will be allocated to each project to guide, to set milestones, to keep each member accountable.
- Budget of $10,000 will be provided to each group. Additional funding may be sourced, but accounted for as part of project proposal and reporting. This additional amount may be capped (TBC)

The expected skills/experience/knowledge addressed in LCI program.

Group standards dynamics and culture
Understanding self and others: DISC, learning styles, communication styles, etc.
Presentation skills
An introduction to MLA, its programs and activities
How to work with the media
Design Thinking
Values
Mental health
Leadership
Media training and messages (inc social media.)
Innovation, Entrepreneurship and Change Management
QLD, Vic, Tas, other production systems

LCI program formal training

Interns in the first two programs have had the requirement to undertake and complete the Graduate Certificate in Agricultural Consulting through UNE. This has been reviewed (by program managers and via feedback from the intern group) and the complete course is not deemed relevant for the interns in Program Three.

Several options are being considered for inclusion in Program Three through formal training institutions but will not result in an actual qualification. The training may be credited towards other study if the interns would like to do so beyond the program. The program has not budgeted for formal training as interns have carried the cost of their own education in the past. However, the program may subsidise training as the options being considered would be deemed essential activity for the interns.

Quotations have been sought from the relevant training providers but are not available yet. Regardless, some options for considerations:

- Employers pay for the training cost (as access may be provided to the employer as well)
- Interns pay for the training cost

- Employers pay for a % of the training cost, subsidised by the program
- Interns pay for the training cost, as part of their salary package (before program commences)

Intern criteria

- Must want to develop a career as a livestock consultant.
- Ideal age is 22-30. People outside this range may be accepted, but determined on their ability to fit within the group.
- Should have one to two years of life experience either working independently, travelling or expressing a level of independence and maturity.
- Demonstrate a passion and an interest for consulting and or change management within the industry.
- May have a degree or tertiary education (should further training as part of program activities be required)
- If currently employed with the host employer, must be new or relatively new i.e. less than one year within the business.
- Must be willing to travel or potentially relocate

7.2 Appendix B – LCI3 Project Plan

Year	Month	Intern activity	Employer Activity	Retreat	Location	Other Optional Event	
2019	Sep		Call for Employer EOI				PRE PROGRAM DEVELOPMENT
	Oct		Employers confirmed/ Call for Intern EOI				
	Nov		Interns confirmed				
	Dec						
2020	Jan	Commence Employment					FORMING
	Feb		Develop Skill Development Plan				
	Mar	Retreat	Retreat	1	Sydney		
	Apr	Group Hook up					STORMING
	May	Retreat	Commence Industry Project	2	Tasmania		
	Jun	Individual catch up	Employer hook up				NORMING
	Jul	Retreat		3	Melb/Regional Vic	Lambex	
	Aug	Individual catch up					
	Sep	Group Hook up	Employer hook up				
	Oct	Joint group hook up	Joint group hook up				
	Nov	Retreat		4	TBC		PERFORMING
	Dec	Individual catch up	Employer hook up				
2021	Jan						
	Feb	Group Hook up	Review SDP		Potential for informal gathering	Evoke AG	
	Mar	Individual catch up	Employer hook up				
	Apr	Group Hook up					
	May	Retreat		5	Rockhampton/QLD	Beef Week	
	Jun	Group Hook up	Employer hook up				
	Jul	Joint group hook up	Joint group hook up				
	Aug	Group Hook up	Industry Project due				

	Sep	Individual catch up	Employer hook up				
	Oct	Group Hook up	Employer hook up				
	Nov	Retreat	Retreat	6	TBC	MLA AGM	ADJOURNING
	Dec						

7.3 Appendix C – Revised 2021 LCI3 Plan for COVID Normal Program

Background

COVID-19 restrictions resulted in a dramatic change to the design of the LCI3 program. The program emphasised the regular contact between participants and aimed to cover relevant content possible via online learning. A Steering Committee meeting was held in October 2020 to discuss the programs progress, outlook and plans for 2021. As a result, this document outlines the plans for 2021, assuming a national COVID Normal situation would be achieved, where interstate travel is both possible and safe.

This document outlines some considerations and possible plans for 2021 for consideration by the Steering Committee, utilising feedback from participating employers and interns alike.

Intent and Objectives

The intention for 2021 is to ensure the following objectives are met:

- Interns develop relationships with MLA and each other,
- Undertake relevant training to develop relevant skills for livestock consulting
- Employers are supported and HR skills are increased.

What's been achieved and covered so far

The programs activities have revolved around fortnightly zoom-based hook ups, averaging an 80% attendance rate. All sessions have been recorded and uploaded to a private YouTube link for sharing with those unable to attend. Content that can be delivered online, has been delivered online. Some content will need revisiting, while others have been intentionally put on hold until face to face training can occur. Table 1 outlines the content delivered, needing expanding or yet to cover.

Table 1. LCI3 Content

Purpose	Content covered	Content to be expanded on	Content not yet covered
Getting to know each other	Industry Project teams	Industry Project teams Group Dynamics Teamwork	VARK Learning Styles
Getting to know MLA	MLA Industry Funding Design Led Thinking	MLA Industry role and key people	
Getting to know you	DISC	Intern	Mental Health Understanding your values
Developing Consulting Skills	Media Skills Ken Solly – personal experiences and tips Lu Hogan –personal experiences and tips	Analysing data Group Dynamics & Facilitation Employer HR Skills	Presentation Skills Innovation Industry Disruptors Change Management Financial literacy and farm business analysis– UM study

Rational and focus in 2021.

The group life cycle has been considered in the design of the program. The six gatherings providing a process for group forming, storming, norming, performing and then transforming. The intern group are well into the norming stage, with an acceptance of each other and a general interest in each other's work programs. In order for the group to move into the performing stage, considerable effort will need to be placed into the norming process in 2021. This will include the setting of objectives for the year, developing of team work, vulnerability and increased understanding of MLA and opportunities within.

Saying this, there is significant activity between interns already evident, with private social media and networking where possible, supporting each other by sharing during sessions and individual follow up. Feedback from the introduction of the industry project has been positive with all participants in working closer with each other.

The content to be covered or expended upon in Table 1 will be the focus for 2021 program delivery.

It was intended that alumni from previous programs would interact with the current participants as possible during retreats. As a result of the online space and the ability for all to participate across the country in an opportunity to wrap up 2020 surfaced with a combined alumni conference. This will wrap up the 2020 online program and aims to build some excitement and focus of 2021.

Feedback has been sought from employers and interns as to the planning needs for the 2021program. Consideration needs to be made for what COVID Normal actually looks like for each state, including restrictions and quarantine requirements for each intern/employer returning home. The length of time deemed acceptable for travel and being away from work has been sought from employers and interns alike.

Plan A addresses an optimistic view that face to face activity will be possible in the first third of the year, but will be eased in to the program design. Three face to face activities (one including employers) will be balanced with online catch ups as well.

Plan B considers the potential for outbreaks at either state of national level and relies on no face to face activity. However, online sessions will be less often and longer in format.

Plan C, although not outlined below is likely to be the program format utilised. The format of Plan A will be followed and adjusted regularly in accordance with relevant restrictions, moving to Plan B if required.

Plan A – COVID Normal - Limited travel restrictions, no quarantine requirements

Date	Activity	Format
Feb	Setting objectives for 2021. Each intern sets goals and objectives for the final year of the program. Utilising content from Alumni Conference and SDP developed earlier in 2020. Actions created for each individual to follow up.	Online. Individual sessions.
March	Commence formal study with Uni of Melb	Undertaken online inc regular activity and group discussions.
April	Group hook up -1.5hrs - Industry project updates - Guest speaker - Employer	Online
Mid May	First retreat – Sydney 4 days Employers – ½ day HR workshop Interns & Employers – Team building exercises (DISC, VARK, networking, sharing (quarantine station?). Interns – Presentation skills workshop	Face to face
June	Second retreat – Victoria 3.5 days Interns – Uni of Melb face to face day Values and perception Mental Health Visit PTN sites Group facilitation Guest speaker - Wilson	Face to face
July	Individual coaching	Online/Phone
Aug	Group hook up -1.5hrs - Industry project updates - Guest speaker - Employer	Online
Sept	Group hook up -1.5hrs - Industry project updates - Guest speaker - Employer	Online
Oct	Individual coaching	Online/Phone
Nov	Final Retreat – Location TBC 3 days The future of livestock and livestock consulting Innovation - MLA - Emma Black (Ag Tech) Disruptors - Meat Analogue - Welfare - Carbon Graduation (aiming for MLA AGM audience) Where to next for you/ this group?	Face to face
Dec	LCI Alumni conference	Online

Plan B – COVID Normal, or with state based outbreaks and resulting restrictions

Less sessions, but longer. Once a month 2 – 2.5hrs

Setting objectives for 2021.

LCI Employer HR workshop - online

Date	Activity	Format
Feb	Setting objectives for 2021. Each intern sets goals and objectives for the final year of the program. Utilising content from Alumni Conference and SDP developed earlier in 2020. Actions created for each individual to follow up.	Online. Individual sessions.
March	Commence formal study with Uni of Melb	Undertaken online inc regular activity and group discussions.
March	Employer HR workshop and networking session – 2 hrs	Online
April	Group hook up – 2 hrs - Industry project updates - Guest speaker - Employer	Online
May	Interns – Uni of Melb final session – 4hrs	Online
June	Group hook up – 2 hrs Guest speaker - Values and perception – Jill Rigney Guest speaker - Mental Health – Danielle Reeve	Online
July	Group hook up – 2 hrs - Industry project updates - Guest speaker – inspirational (Wilson Ekayupan)	Online
Aug	Group hook up – 2.5 hrs - Industry Innovation – Emma Black/Other? - Change Management -	Online
Sept	Group hook up - Industry disruptors o Meat Analogue o Welfare o Carbon - Guest speaker - ???	Online
Oct	Individual coaching	Online/Phone
Nov	Final Retreat – Location TBC The future of livestock and livestock consulting Graduation (aiming for MLA AGM audience) Where to next for you/ this group?	Face to face or online if need be
Dec	LCI Alumni conference	Online

7.4 Appendix D - Retreat agenda

Livestock Consultants Internship – Program Three

Accommodation:

- Vibe Hotel North Sydney - 171 Pacific Highway, North Sydney.
- Accommodation is twin share.
- If you have a car, you will need to give your registration number to the front desk on check in.

Dinner: Tuesday 25 May 2021. As most will be coming into Sydney on the Tuesday night, we will meet casually near the hotel for dinner at 7pm. Meet in hotel foyer from 6:50pm. Meal will be at your own cost.

Intern Workshop (Day One)

Location: MLA Office (40 *Mount Street, North Sydney*)

Date: Wednesday 26 May 2021

Time: 8.30am – 5.00pm

Note: *Wear comfortable shoes for walking*

Time	Details
8.30am –	Meet outside MLA office, 40 Mount St, Nth Sydney LCI3 Program intro: Agenda review Expectations Program Update
10:00am – 1:30pm	The MLA Roadshow
1:30 – 2:00pm	Lunch break
2:00pm – 2:30pm	Industry Project Update - Can we get the mentors? -
2:30pm – 5:00pm	Group Activity
6.30pm	Dinner at The Greens

Livestock Consultants Internship – Program Three

Intern Workshop (Day Two)

Location: MLA Office Level 1, 40 *Mount Street, North Sydney* - Training Room

Date: Thursday 27 May 2021

Time: 8.30am – 5.00pm

Time	Details	Facilitator
8.30am – 9:00am	Intro to rest of the day	Ben Reeve
9.30am – 12.30pm	Intern presentations	Ann Burbrook
12.30pm – 1.15pm	Lunch break	
1.15pm – 3.00pm	Presentation workshop	Ann Burbrook
3:00pm – 3.20pm	Afternoon tea break	
3.20pm – 5.00pm	Presentation workshop	Ann Burbrook
6.30pm	Dinner at Piato – Activities at dinner.	

Livestock Consultants Internship – Program Three

Intern Workshop (Day Three)

Location: MLA Office (*Mount Street, North Sydney*) Dining Room

Date: Friday 28 May 2021

Time: 8.00am – 2.00pm

Time	Details	Facilitator
8.00am – 10:00am	Presentation Workshop.	Ann Burbrook
10.00am – 10.20am	Morning tea break	
10.20am – 12.00pm	Intern Presentation Workshop	Ann Burbrook
12.00pm – 12.45pm	Lunch break	
12.45pm – 3.00pm	Presentation workshop continued (if needed) Next Retreat and wrap up - Introduction to People, People, People.	Ann Burbrook & Ben Reeve
3.00pm	FINISH	

7.5 Appendix E – Retreat Evaluation

EVALUATION FORM

LIVESTOCK CONSULTING INTERNSHIP 3 - FIRST RETREAT

Feedback on the First Retreat

Overall, how satisfied are you with this retreat?	9.25/10 (Averaged)
How valuable was this retreat in boosting your communication/presentation skills?	9.5/10 (Averaged)

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
This retreat has met my expectations	**6**	**4**			
All material was well presented	**7**	**3**			
The program contained too much information for the time available		**1**	**1**	**5**	**3**
I will be able to use the skills gained from this retreat	**8**	**2**			
The retreat atmosphere helped me to relax and learn	**8**	**2**			
Presenters were well prepared and understood their tasks	**7**	**3**			

General Feedback

Sam – Everything was great, so worthwhile. I am leaving today with so much more knowledge, skills and friends than I came in with. I really can't think of any way this could be improved.

Will – had a great time and learnt a lot very supportive, made me feel accepted and that I had a future with MLA.

Pete – I had the best time! I love networking with likeminded people.

Karissa – No feedback

Emma – I absolutely had the most amazing time. I'm so glad my first time in Sydney was with the best group of lifelong friends. Anne has changed my life I am so thankful to have her in my toolbox. Thanks Ben

Harriet – Great to meet everyone. Found the presenting aspect and some activities very challenging but I needed to be pushed out of my comfort zone to improve. Overall a great experience.

Laura – It was all absolutely amazing. Was wonderful to meet all the people from MLA, and Anne's presentation was fantastic.

Jo – Great retreat learnt a lot, will really benefit. Content, venue, accommodation meals were all fantastic.

Courtney – I would have liked a bit more MLA interaction but no less time with Ann – we needed it. Loved Ann's part. Maybe a little more down time would be good but all in all a great time.

Belle – Fantastic session with Ann. Good content, venue and accommodation.

7.6 APPENDIX F - GROUP PROJECTS

7.6.1 Group One –Samantha Moorfield, Laura Forward, and Courtney Cheers

=

Final report

How can producers best maintain new sown pastures for persistence and resilience in the whole farm system

Project code: <MLA project code = X.XXX.nnnn>

Prepared by: Courtney Cheers Aggregate Consulting

Laura Forward Meridian Agriculture

Samantha Moorfield SheepMetriX

Date published: 09/11/2021

PUBLISHED BY
Meat and Livestock
Australia Limited PO
Box 1961
NORTH SYDNEY NSW 2059

This is an MLA Donor Company funded project.

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government and contributions from the Australian Meat Processor Corporation to support the research and development detailed in this publication.

Abstract

The question underpinning this project is *'How can producers best maintain new sown pastures for persistence and resilience in the whole farm system?',* a pertinent question facing the industry, affecting the profitability of extensive grazing systems. There is a need to better present existing research to enable a higher rate of adoption in producers. A collaboration between this project and an existing project in the Feedbase Adoption Plan was formed to produce a Profitable Grazing Systems course on re-sowing pastures. The component this project was responsible for was delivered in full for review by MLA and is still in the final stages of the course development. The benefit of increasing profitability for individual producers in increasing their pasture persistence can be extrapolated across the entire industry.

Executive summary

Background

Persistence and productivity of pastures are key factors affecting the profitability of extensive grazing systems and have been the focus of much research over the last 50 years. The question underpinning this project is *'How can producers best maintain new sown pastures for persistence and resilience in the whole farm system?'.* Information available to industry on pasture management during the establishment phase has been collated over a long period of time, and not readily accessible for red-meat producers to develop skills and implement learning in their business. This project sought to contribute to a coaching-style Profitable Grazing System (PGS) course on re-sowing pastures in a way that sets them up to be persistent and productive.

Objectives

The impact of the project will be to contribute to a course that will focus on increasing grower capacity to make decisions to increase their economic return of investment in pastures either by:

1. Reducing the investment required by removing practices that will not return adequately OR managing pastures in a way that increases their longevity, thereby reducing the frequency of investment in re-sowing pastures

2. Increasing the productivity of those pastures and therefore increasing the income generated from that investment.

The component of the course that this project was responsible for delivering was completed June 2021. The entire course content is in the second draft phase and working to a timeline of rolling the course out during 2022.

Methodology

The design phase uncovered a common theme that this is not a new issue, and it is highly relevant to the industry; therefore, a large amount of work had already been undertaken, and was still being undertaken in this field.

The project sought to collaborate with an existing project to develop a PGS course on re-sowing pastures, putting together both content and lesson plans.

Results/key findings

A small survey in the design phase uncovered that stakeholders in the industry felt this was a relevant topic. The main project result was the collation of content and lesson plan for the course, delivered in June 2021. Outcomes for industry cannot be reported on until the course is rolled out and data can be collected.

Benefits to industry

Increased adoption of appropriate perennial pasture management practices will benefit the wider red meat industry. Improved persistence and resilience of perennial pastures and the optimisation of stocking rate can improve the productivity, profitability and sustainability of extensive livestock grazing operations in southern Australia. These benefits align with the FAP desired outcomes of improved productivity of extensive sheep meat and beef cattle enterprises and overall business performance.

Future research and recommendations

- Advisors across different regions of Southern Australia with the relevant experience, skills and knowledge should be given the opportunity to become accredited deliverers of the pasture re- sowing PGS. Less experienced advisors should also be given the opportunity to become accredited deliverers through the 'train the trainer' mentor program.
- Increased investment in the development of pasture cultivars that are more robust and able to persist as the Australian climate becomes hotter and soil moisture decreases.
- Research on species and cultivar specific grazing management guidelines during the pasture establishment phase.
- Research on species specific benchmarks available for weed and pest thresholds in the establishment phase.

1. Background

Persistence and productivity of perennial pasture species are fundamental to the profitability of extensive livestock systems in southern Australia. The establishment phase of newly sown pastures is vital to this as the failure of sown species to persist is perhaps the costliest component of pasture renovation. Appropriate management strategies during the establishment phase that will generate a return on investment vary between environments and species. This makes identifying the 'best steps' for pasture persistence and productivity a complex task for producers. The question underpinning this project is *'How can producers best maintain new sown pastures for persistence and resilience in the whole farm system?'.* Given this has been a perennial question for the industry, many of the best answers available to us lie within existing research and industry expertise. Bringing together this information in a way that is relevant, accessible and able to be applied to varying environments is key to a) making better use of existing information and b) identify knowledge gaps for future research.

As part of Feedbase Investment Plan (FIP), a final report on Establishment and Persistence of major temperate grasses and tropical pastures in Southern Australia identified the two key issues to be pasture establishment and pasture persistence. Successful pasture establishment for ongoing persistence and production is defined by the EverGraze principles of 'Putting the Right Plant in the Right Place for the Right Purpose with the Right Management'. Overarching themes for these principles include soil health, species selection, weed management, grazing management.

The Feedbase Adoption Plan (FAP) is an MLA project currently underway to develop awareness activities, training, related products, and Supported Learning Programs (SLPs) across the "Feedbase Four" themes soil health, pasture weeds, plant nitrogen and pasture persistence. The FAP will build on the research outcomes from the FIP. This project sought to align with the FAP outcome of enabling producers and advisors to apply management practices to maintain productive pastures on their farms and address pasture run-down.

Information available to industry on pasture management during the establishment phase has been collated over a long period of time, and for some of this research, the methods of disseminating information have since evolved. The need to increase adoption of best practice management strategies through modern approaches to education such as coaching style learning has been recognised (C. Nicholson, personal communication, February 2021). The proposed project aims to address the following gaps in pasture establishment information available to industry:

1. Sowing
2. post-sowing observations
3. Grazing management
4. Weed and pest control

The initial project sought to create a short course delivered to producers, with the intention being to increase adoption through capacity building. Given this is a highly relevant question to the industry, this project formed a collaboration with an existing MLA project to develop and deliver a Profitable Grazing Systems course "Re-sowing Pastures" as part of FAP. The collaboration was to ensure that developed products are delivering the same messages and the same work is not duplicated, increase the efficiency of funding from MLA and combine skills and experience from several consultants in the industry.

2. Objectives

This project, in collaboration with the Feedbase Adoption Plan, proposes to deliver the following output:

S	Deliver components of a PGS course on pasture establishment, and appropriate management strategies during the establishment phase of the pasture based on the relevant regions and species being sown
M	A manual provided to producers, with course content and instructions for deliverers to ensure they are delivering consistent and correct key messages. Pre- and post-course surveys will identify participants' change in knowledge and skill level because of participating in the course.
A	Given the abundance of research available in the industry, and the collaboration with experienced consultants and project deliverers, this output of the project is achievable.
R	By collaborating with an ongoing, MLA funded research project to deliver the same outputs, this project is working to ensure the relevance of the topic to industry as the topic has been identified previously as being important to red-meat producers.
T	The component of the course we will be working to deliver will commence Feb/March 2021 set for completion by October 2021 where the final report for the project and output will be delivered.

The intended outcome of the PGS course is to increase the adoption of and increase the capacity of producers to implement appropriate strategies during the re-sowing and establishment phase of pastures. The impact of this will be to increase the economic return of investment in pastures for producers, either by:

1. Reducing the investment required by removing practices that will not return adequately OR managing pastures in a way that increases their longevity, thereby reducing the frequency of investment in re-sowing pastures

2. Increasing the productivity of those pastures and therefore increasing the income generated from that investment.

The component of the course that this project was responsible for delivering was completed June 2021. The entire course content is in the second draft phase and working to a timeline of rolling the course out during 2022. The objectives of the course in terms of adoption and the intended benefits of adoption are not able to be reported on due to still being in the development phase.

Methodology

Project design and methods

The initial project began in the design phase, with a broad question that was pertinent to industry. The project team set out to first understand the issues and the relevance of the question, and then determine work previously completed in this area.

Numerous stakeholders including red-meat producers and their advisors, as well as MLA representatives across many regions were consulted as part of the proposal development. A series of five questions were developed and informal interviews were conducted to gain a range of perspectives on the current issues the industry faces regarding persistence and resilience of new sown pastures. This information was pooled, and several key issues were identified which informed the project concept.

A common theme that emerged by following the design-led thinking practices provided by MLA was this is not a new issue, and it is highly relevant to the industry; therefore a large amount of work had already been undertaken, and was still being undertaken in this field.
This is a highly complex issue that has not been 'solved' after years of work. Rather than duplicating research work, the project moved toward a focus on collating existing work into a format that was structured, easy to follow and practical.

In this phase, we contacted the project team for FAP and discovered they were already undertaking a similar initiative under the PGS banner. The decision was made to collaborate.

The two teams met in Euroa on the 4th of February 2021 to begin planning the course. As each section (content and relevant skill assessment) was determined, it was delegated to a team member that was best qualified to complete it. Content was collated during February/March, and the first draft was created. The course is now in the final draft stages.

The design-led thinking approach was considered effective. We arrived at a similar plan to what was already being funded in industry, which indicated that the deliverables were relevant and timely to industry. The approach of combining funds and expertise through collaboration proved successful in allowing the project to generate a greater impact than what would have otherwise been achieved.

The timeline for the project was as follows:

Deliverable	**Date**
Final Proposal Approved & Commencement of Project	January 2021
Project team meeting with Cam Nicholson, Jim Shovelton, Lisa Warn and Lisa Miller, location likely to be central Victoria e.g. Seymour	February 2021

Development of PGS course material	February - March 2021
Course material - first draft submitted	March 2021
Course material reviewed by MLA (current stage)	TBC
Final Report submitted to MLA	October 2021

Results

During the project design phase, a small survey was conducted to better understand the issue and the needs of the industry (see Appendix 9.1 for survey results). The survey was also an opportunity to test whether initial project plans were relevant to producers and industry.

The result of the project was delivering content and resources for components of the pasture re-sowing PGS course (see Appendix 9.2 for content contributed by the project team). Note that content developed by the project team was edited and altered by Cam Nicholson before being included in the deliverers manual. The deliverers manual is in the final draft stages and is currently being reviewed by MLA. Once the deliverers manual is finalised the participants manual will be developed by Cam Nicholson. Material that was developed by the project team and not included in the deliverers manual may be included in the participants manual. This cannot be reported on until the participants manual is developed.

Outcomes for industry cannot be reported on until the course is rolled out and data can be collected.

Conclusion

Key findings

Initial survey results from various industry stakeholders revealed insight into the main issues producers face with perennial pasture establishment:

- Economic waste for the individual business which can be extrapolated to the wider red meat industry. Economic loss occurs from direct costs of pasture establishment, and indirect costs associated with not achieving increased productivity from the feedbase.
- Producers are reluctant to undertake future pasture renovation if previous failures have occurred.
- Lack of understanding and skills in analysing the cost- benefit of implementing management practices such maintenance and capital fertiliser and pasture renovation.

- Matching stocking rate to carrying capacity to achieve optimal pasture utilisation. Pastures are often under or over stocked and this has implications on the production and persistence of the feedbase and animal production.
- Access to cultivars that are suitable for the Australian environment. The development of persistent and resilient pasture genetic material and seed production in Australia has declined.
- Selection of the appropriate species and cultivars for the environment, and then applying the appropriate management for those species and cultivars. It is important to understand the physiology of the species and cultivar, and their requirements at different stages of establishment and at different times in the season.
- Simple and easy to implement tools for adoption of best practice pasture establishment and management need to be made available to producers, for example:
    - Expansion of the Feed on Offer (FOO) library for the purpose of calibrating dry matter estimates
    - Simplified fertiliser calculations to help producers understand:
        - How much NPK (nitrogen, phosphorus, potassium) is being removed with production and how much is needed to replace it.
        - Benchmark levels of soil fertility and pH throughout the soil profile.
        - How much rain is needed for pasture persistence?
    - Persistence and production data on species and cultivars. A simple way to do this would be a rating system.

As a result of undertaking research to build PSG course content the following gaps in knowledge and information available were identified:

- Lack of species and cultivar specific grazing management guidelines during the pasture establishment phase. Information available is largely anecdotal and based on experience.
- Lack of species-specific benchmarks available for weed and pest thresholds in the establishment phase.

Benefits to industry

The project objective was to assist the development of content for the pasture re- sowing PGS, with the overall aim of improving the persistence and resilience of new sown perennial pastures and therefore the profitability of extensive livestock grazing systems in southern Australia.

The course has been developed by a team of advisors that are highly experienced and knowledgeable in pasture management in extensive grazing systems in southern Australia. Delivery of the pasture re- sowing PGS is expected to provide producers with the tools, skills and knowledge to make the best decisions for their production system when establishing a newly sown pasture.

Increased adoption of appropriate perennial pasture management practices will benefit the wider red meat industry. Improved persistence and resilience of perennial pastures and the optimisation of stocking rate can improve the productivity, profitability and sustainability of extensive livestock grazing operations in southern Australia. These benefits align with the FAP desired outcomes of improved productivity of extensive sheep meat and beef cattle enterprises and overall business performance.

Base level delivery numbers for the pasture re- sowing PGS are unknown as the project team was contracted to write the material for the PGS rather than deliver the course. The project manager

Cam Nicholson was involved in a large survey testing the demand for MLA products. Early results showed around 28% of producers would be willing to pay an average of $975 to participate in the course. The cost of delivering the course is likely to be above that figure, so this would see less than 28% of producers that would pay to participate in the course. Even with 10% of producers willing to participate, this is a significant number of producers.

LCI industry project review

Reflections on group performance

Working on this project as a group was a great experience, allowing us to explore different ways of working together - seeing what was efficient and worked for us all, and what did not. The intern group worked quite well together, quickly developing a process of working on documents between us - this included things such as using google docs to prepare a proposal together, colour-coding each of our work to allow easy editing and reviewing, as well as having regular phone or zoom catch-ups to go through it all together.

The project group as a whole, including the project coordinator and more experienced members, did not work well together. It proved to be quite a struggle to maintain effective communication with the project coordinator, which made it very difficult to stick to our planned timelines and receive necessary feedback on our input.

Reflections on undertaking an industry project

The opportunity to experience the entire lifecycle of a project was a highlight for the LCI project. The short time frame and limited budget meant that it was difficult to address the assigned question in an impactful way on our own. The decision to collaborate was pivotal for the project, and allowed our team to contribute in a more impactful way. It would be useful for future groups to be 'paired' with current industry projects.

Future research and recommendations

During the project design phase initial survey results identified some gaps in research and development. When researching to develop course material a key challenge was addressing gaps in knowledge and areas where little research has been done. As a result some recommendations for future research and development can be made:

- Increased investment in the development of pasture cultivars that are more robust and able to persist as the Australian climate becomes hotter and soil moisture decreases. Genetic material is currently being sourced from overseas where there are different environmental challenges to the Australian environment.
- Research on species and cultivar specific grazing management guidelines during the pasture establishment phase.
- Research on species specific benchmarks available for weed and pest thresholds in the establishment phase.

To increase the adoption of best practice pasture establishment and management advisors across different regions of Southern Australia with the relevant experience, skills and knowledge should be given the opportunity to become accredited deliverers of the pasture re- sowing PGS. Less experienced advisors should also be given the opportunity to become accredited deliverers through the 'train the trainer' mentor program. Upskilling advisors under the PGS would help ensure technically sound information and advice according to industry best practice standards is given to producers.

One of the project outcomes that was not achieved due to time frame constraints was the development of a 'ute- guide' type supporting material for the PGS. The ongoing development of simple, easy to access and implement tools and materials such as the 'ute- guide' would improve the uptake and adoption of the information currently available.
Adoption activities focussed on utilising modern approaches to education such as coaching style learning for both producers and less experienced advisors would ensure full value is achieved from the project.

References

Appendix

Initial survey results

Questions	What are the repercussions of not achieving persistence in pasture base on; a) the individual farm business and; b) red meat production in southern Australia	What is the biggest challenge for producers in achieving persistence in their pastures?	What represents persistence and resilience in the system? What does the optimal pasture look like?	What are the major barriers for adoption of best practice management of pastures? Is the information available and not being utilised? Why not?	What tools would you like to see available?
Responses	•Economic waste (i.e. low return on the cost of sowing new pastures) •Needs to be 4 DSE/hectare gain if the pasture	•Understanding the cost-benefit of maintenance fertiliser, capital fertiliser and pasture renovation	The optimal pasture is the most profitable one. The profitability of a pasture needs to account for		More tools like the FOO library to calibrate producers on making DM assessments. •Simplified fertiliser

	persists to justify the economics •Inconsistent stocking rate - not driving pasture production and failing to maintain inputs will mean declining pasture persistence and likely reduction of stocking rate between years. This will affect the long term production and therefore profitability. •The cost on the individual business can be extrapolated as a cost to the entire industry	•Understocking and under utilising pastures •Overstocking and over utilising pastures •To get the increase in production capacity, pastures cannot be 'molly-coddled' because at different times (due to drought, flood, high stocking rate, insects) they will be put under stress. If they cannot handle these stresses, then that is a problem.	the cost of establishment and also its marginal benefit over what was there before. You also need to be able to separate out the benefits of additional soil fertility from the benefits of the change in species. The marginal benefit of the species is the only margin above a highly fertile pasture. When you consider all of these things, persistence is the number one profit driver up to ten years of age. After that, because of the time value of money, the additional benefits of persistence begin to diminish. •Balancing outputs with inputs - the ability to stock optimally long term. 10, 20, 50 years - if the inputs are correct why is		calculator for producers to demonstrate how much NPKS is being removed with production and what is required to replace it - "Pocket Agronomist". •The benchmark levels of soil fertility and pH (on top and at depth), and also the rainfall I need to give myself the best chance of having the pasture persist. •Persistence data on each species along with production data. What makes them more persistent and how do they rate those traits?

			persistence an issue?		
	- Failed investment as it takes a number of years to get a payback from sowing a perennial pasture. - Producers may be reluctant to undertake future pasture improvement programs if failure occurs. - Impact on profitability from direct costs associated with pasture establishment and indirect costs associated with achieving optimal animal production levels.	- Selecting the appropriate species/ cultivars for the landscape. - Access to suitable cultivars for landscapes in Australia i.e. work needs to be done on genetic material - breeding cultivars that are persistent in Australian environments. - Soil nutrition - Getting livestock producers to think of pastures like a crop that needs care, fertilizer and the appropriate grazing strategies applied. - Grazing management and managing stocking rate in variable seasons.		- Understanding best practice grazing management for different species and cultivars. Need to understand the physiology of the species and cultivar, and management at different stages of establishment and at different times in the season. - Lots of information around and good advisors that can provide suitable advice on sowing pastures - The big unknown is do I need to change my species selection to account for increased climate variability? - Producers who have a few failures can be reluctant to	- Upskilling of consultants/ advisors in pasture establishment / management - Pasture assessment methods and then the appropriate actions to take need to be simple and easily applicable for improved uptake of best management practices.

				try again - Still a lot of people who fail to correctly prepare for pasture re-establishment e.g. fertilizer and weed management, and this reduces the success of the pasture.	

Deliverers manual components developed by the project team

Deliverers manual component developed by Courtney Cheers

'Rule in' the economics of sowing are acceptable

The final step is to determine if the economic benefits from sowing are acceptable. The term acceptable is used deliberately because it is up to the individual to decide if they are prepared to accept the anticipated benefits and costs. This training package only needs to ensure the correct analysis is undertaken, not to determine what is an acceptable break-even time and return on investment.

The discounted cash flow method (DCF) is the appropriate approach to consider a return on investment over time. While it may appear complicated, the approach allows additional costs and additional benefits to accumulate at different stages, commonly when large upfront costs are required that are 'repaid' over time. Knowing how long the payback or break-even period is, and the likely return on that investment over a period, is essential information to inform a decision.

The *Evergraze Pasture Improvement Calculator* uses the DCF method and has been recommended for this analysis. It is free and can be downloaded from the MLA website.

Note:

- Trainers may have their own DCF calculator, and this can be used if desired as long as it captures the information outlined below. A simple gross margin calculation is insufficient and should not be used.

Marginal benefit and marginal costs

To assess the merit of sowing a pasture (or any investment decision), the marginal benefit and the marginal cost need to be quantified. Marginal means the *additional* benefit or cost from an additional action.

The term marginal is important to understand, because in most situations some production will be achieved from the paddock, although it may be well below potential. Even weedy pastures which have a short growing season provide some production. If no changes are made, this production is likely to continue and therefore needs to be subtracted from the new total productivity achieved after sowing.

The important marginal benefits and marginal costs are shown (Figure 4) and explained.

Figure 4. Marginal benefits and marginal costs to be considered in an economic analysis.

Major benefits are:

- **Increase in production.** This is the difference between the expected production (stocking rate) on the new pasture to the current pasture. It is easy to confuse the productivity from the new species as the increase in production, when it should be the difference between the new production and the old production.

- **Value per production unit**. This is commonly expressed as $/DSE. Gross Margin is used rather than profit, assuming every additional DSE generally does not incur additional business overhead costs. The value per production unit does not change from the old pasture to the new pasture.

- **Lifetime of production unit increase.** This refers to the persistence of the pasture or the time before you re-sow the pasture. It also includes a possible failure rate. The production pattern over the life-time of the pasture and hence the stocking rate over the pasture life is usually not flat.

Major costs are:

- **Inputs (preparation, sowing, maintenance).** Inputs associated with correct preparation, sowing and maintenance such as fertiliser, seed, machinery costs to ensure the success of the pasture. Maintenance costs should only be what is *additional* to maintenance on the current pasture. This could include extra labour.

- **Foregone grazing.** This is the time the new pasture is unable to carry the stocking rate achieved in the old pasture. A simple method of valuation is the amount of supplementary feed needed to fill the shortfall (assuming the farm is stocked to maximum). If there are other underutilised pasture available, no cost is assigned.

- **Additional livestock.** Increased stocking rate requires more animals. These can either be sourced through purchase or by delaying expected sales. Either way additional livestock have a cost that should be included.
- **Cost of money.** This includes the desired return on investment, interest on the money if not used on resowing, inflation and even tax.

Incorrect economic analysis of investments often comes from attributing the wrong marginal benefits and not including the foregone grazing and additional livestock costs.

TASK: On a whiteboard draw up two columns, with two headings, marginal benefits and marginal costs. Invite participants to identify what needs to be included under each column,

Notes:

- Considering inputs/practices as separate investments rather than grouping them together at the start will avoid confusion.

Calculating the marginal benefits and marginal costs

The costs and benefits of sowing a pasture accumulate over time, often with upfront costs that are 'repaid' over many years. Given the likely costs involved, a comprehensive analysis should be undertaken.

It is recommended the Pasture Improvement Calculator developed in the *Evergraze* program is used. This Excel based worksheet includes all the information to complete a discounted cashflow (DCF) analysis of a possible investment in pasture sowing. This approach captures benefits and costs over time, while taking into account the opportunity cost of the money invested and the risk. DCF is valuable to help understand the likely time reach a positive cash flow and the rate of return on the money invested. It can be accessed at:

https://www.evergraze.com.au/library-content/pasture-improvement-calculator/

There is also an explanatory video of how to use the tool. Participants should be encouraged to download the tool and complete the pasture improvement calculation for the paddock they are considering sowing.

Notes:

- Trainers can use their coaching time to help individual businesses install and use the calculator on their computers.

Demonstrating the Pasture Improvement Calculator

Trainers should demonstrate the steps and information required in the Pasture Improvement Calculator. A real life example should be worked through with participants. Use Appendix 4 to start collating these numbers that can then be transferred into the pasture improvement calculator.

Some critical points that need to be highlighted when using the tool, either because the information may be challenging to obtain, the values are sensitive to the outcome or the terms may be unfamiliar to participants.

These 'grey' areas are:

- **Direct costs of resowing.** These can be broadly estimated at this stage but are likely to be refined once the sowing plan is finalised. The direct costs for consideration are:

- **Infrastructure costs in paddock development**, such as fencing or troughs that leads to better utilisation of the pasture (row 1, Appendix 4).

- **Direct costs related to paddock preparedness and sowing,** which includes, lime, seed, fertiliser sowing costs, herbicides etc (rows 2 to 7, Appendix 4).

- **Annual pasture maintenance costs**. These are likely to be around fertiliser and herbicides (rows 8 and 9, appendix 4).

- **Production curve for a sown pasture**. The 'shape' of the production curve has a major influence on the analysis. Discussing what is a feasible pasture production curve over time for the environment, paddock conditions and species choice is a useful exercise (Appendix 5). The expected life of the pasture is a sensitive value and worth highlighting.

TASK: Participants to create their own production response curve for a sown pasture (Blank chart in Appendix 5).

- **Agistment cost.** This value recognises the loss of grazing while the pasture is being sown. It can be calculated as an agistment cost or cost if supplementary feed is required in lieu of grazing. Calculate and then transfer this value to row 18, Appendix 4.

- **Change in livestock production.** In most cases the value from pasture sowing is derived from increases in stocking rate (DSE/ha) rather than per head performance ($/DSE). In other words, more animals are carried rather than the value of each animal increasing. If this is the case, then it is fair to assume the return per DSE remains the same unless the business overhead costs increase as a result of increasing the total DSE across the farm. This cost is most likely to be linked with labour and would need to be over a large enough scale to warrant additional labour.

There is a capital cost in acquiring more animals (or a foregone income if we retain animals for longer e.g., not sell breeders). If the value of the animal increases, possibly through meeting higher value market specifications or selling at a higher price, then this needs to be included as well. In this case the value per DSE increases.

Calculate and then transfer the gross margin values to rows 19 and 20 in Appendix 4.

· Capital cost of livestock. This includes the additional animals that need to be grazed to reach the peak stocking rate. The source of these animals can be through purchase or by retaining animals that would have otherwise been sold. Both should have the same value. To calculate the value, determine the anticipated livestock price to peak stocking rate and divide by the annual DSE rating (DSE ratings for different classes of stock are provided in Appendix 3). Calculate and then transfer the value to row 21 of Appendix 4.

- **Rates of return**. Values such as opportunity cost of capital, inflation rates, tax rates and interest of borrowed and invested funds may be foreign concepts to include in economic analysis. The values may also be difficult to obtain. Trainers should be able to explain the relevance of these terms and give some guidance on possible values. Once discussed, transfer the appropriate values to rows 22 to 26 in Appendix 4.

- **Residual values**. These values may also be foreign concepts in an analysis. Trainers should be able to explain the relevance of these terms and give some guidance on possible values. For most of the values listed, the residual value will be small. The exception may be infrastructure (fencing, water) that has a value in the future. If in doubt don't include these values. If sowing doesn't pay without the residual value attributed, it is unlikely to be a sound investment. Once discussed, transfer the appropriate values to rows 27 to 31 in Appendix 4.

- **Environmental benefits.** The calculator provides opportunity to capture some long term environmental benefits created through the improved pasture such as groundcover protection or increased soil carbon. These benefits are also hard to quantify and if in doubt don't include these values. Transfer this value (even if 0) to row 32, Appendix 4.

Case studies

Case study examples are a useful way of highlight the sensitivities of some key values. Two case studies are provided (Appendix 6), one related to sowing, the other comparing manipulation interventions instead of sowing. They highlight the sensitivity around different assumptions, especially longevity of the pasture life and risk of establishment failure. Trainers should become familiar with these examples or create their own.

TASK: Demonstrate the use of the Pasture Improvement Calculator by using the case study examples in Appendix 6 or using other examples.

Ask participants to share their 'take home' messages from the analysis.

Note:

- Trainers may wish to create their own examples that better suit their situation. This will help becoming familiar with the Pasture Improvement Calculator.

Making a decision

Resowing pastures is a costly exercise and is highly sensitive to key assumptions as demonstrated by the Pasture Improvement Calculator. After running an individual scenario, the return on investment may be lower than expected, perhaps even negative. An important part of farmer decision making is the prioritising of investments to yield the best return. The value in the Pasture Improvement Calculator is to appreciate the true costs and true returns over time. Even if the return on investment for pasture renovation is positive, it may show that other investments will yield a better return. By analysing the planned pasture renovation correctly, it enables an informed decision to be made.

The results from using the Pasture Improvement Calculator are built on a series of assumption. These assumption may change during this training due to two major reasons:

- Participants learn more about the costs and benefits, so can revise the initial values used.

- Participants appreciate they can adopt practices that can alter these assumptions, especially in reducing the risk associated with failure, extending the longevity and reducing the decline of the pasture productivity after the peak.

Therefore, it is recommended participants undertake an initial assessment using the Pasture Improvement Calculator and decide on whether they wish to proceed only after compelling the second part of the training package. The Pasture Improvement Calculator is revisited in part 2, to review the assumptions and confirm the decision proceed to developing a sowing plan.

Homework:

- Complete an analysis using the Pasture Improvement Calculator. Examine different sensitivities by changing assumptions the producer believes are high risk or uncertain.
- Encourage participant to take a soil test on the paddock (see section in pre sowing soil conditions).

Appendix 4. Information required for Evergraze *Pasture Improvement Calculator*

Row		Initial answer ($/ha)	Revised answer ($/ha)
Paddock development (once off sowing) costs			
1	Paddock infrastructure (fencing, troughs, pipes etc)		
2	Cultivation		
3	Lime/gypsum		
4	Seed		
5	Fertiliser		
6	Sowing		
7	Herbicides		

Paddock maintenance (annual) costs			
8	Fertiliser		
9	Herbicides		

Row		Answer	Answer
Paddock and Pasture Production Values			
10	Expected pasture/infrastructure life (4-20 years)		
11	Chance of pasture failure (%)		
12	Stocking rate before improvement (DSE/ha)		
13	Peak stocking rate after improvement (DSE/ha)		
14	Time to reach peak stocking rate (1-5 years)		
15	Year when stocking rate begins to decline		
16	Stocking rate at end of pasture/infrastructure life (DSE/ha)		
17	No. of weeks grazed in year of sowing		
Economic and Financial Values			
18	Agistment cost ($ per DSE per week)		

19	Gross margin before improvement ($/DSE)		
20	Gross margin at peak stocking rate ($/DSE)		
21	Capital cost of livestock ($ per DSE)		
22	Opportunity cost of invested capital		
23	Expected annual rate of inflation		
24	Marginal Tax Rate		
25	Interest on borrowed funds		
26	Interest on investment funds		
Residual values			
27	Residual values of seed and sprays ($/ha)		
28	Residual values of lime/ gypsum ($/ha)		
29	Residual value of fertiliser ($/ha)		
30	Residual value of soil N (Higher legume content ($/ha)		
31	Residual value of paddock infrastructure ($/ha)		
Estimated environmental benefits			
32	Annual environmental benefits ($/ha)		

Appendix 6. How do the different assumptions affect the results? – two case study

James McDonald is considering sowing an old pasture on his farm located in south-west Victoria, which runs 8000 composite ewes producing prime lambs. That paddock is approximately 100 hectares, and the current pasture is reasonably weedy. James estimates it is currently carrying 8 DSE per hectare.

Keen to only invest where it is worthwhile, James has a return threshold of 15%, which means that if an investment will yield less than this, he will not invest.

James uses the Pasture Improvement Calculator to assess investing in re-sowing his pasture. His assumptions are listed (Table 1).

Table 1. Assumption used in Pasture Improvement Calculator for sowing

Expected life of the pasture	20 years
Chance of failure	10%
Current stocking rate	8 DSE/ha
Peak stocking rate after improvement	12 DSE/ha
Time to reach peak stocking rate	2 years
Year when stocking rate begins to decline	Year 8
Final stocking rate at the end of the pasture life	8 DSE/ha
Pasture available for grazing in first year	26 weeks
Cost of supplementary feed	$1.50/DSE//week

Gross margin per DSE	$65/DSE
Capital cost of livestock	$150/DSE
Total cost of re-sowing	$425/hectare

James' plan will generate a rate of return of 22%, which is above his investment threshold.

James also understands the calculator results are sensitive to a number of different assumptions, and to understand the risk of not achieving the plan, he generates some sensitivity tables.

James is hoping his new pasture will last 20 years, and only has a 10% chance of failing to persist. But if it doesn't, how will it affect the outcome (Table 2).

Table 2. Sensitivity of pasture improvement rate of return to failure rate and persistence

Pasture life	**Failure Rate (% chance)**		
	50%	**25%**	**10%**
2	-86%	-73%	-62%
5	5%	10%	13%
7	12%	16%	19%
20	17%	20%	22%

James can see that a pasture life below 7 years is not going to be around his investment target, assuming the original plan stays the same. He can also see that the return will be marginal if the chance of success isn't more than 50%. Sowing species that establish and persist will therefore be an important part of James' plan.

This sensitivity table is also working on the assumption that James will achieve his budgeted 4 DSE/ha increase in stocking rate. If the stocking rate lift was only 3 DSE/ha, the pasture life would need to be 15 years (assuming a failure rate of 10%) to achieve a return of 16%.

To check his other assumptions, James runs another sensitivity table (Table 3).

James is budgeting for a marginal lift of 4 DSE per hectare in stocking rate, which will be achieved by Year 2. The lift will maintain at this level until Year 8, where the stocking rate will begin a steady decline to the original stocking rate by the end of the pasture life.

Based on his 5-year average, James is also budgeting for a gross margin of $65 per DSE but is cautious of how deviations to this will affect the entire investment.

Table 3. Sensitivity of pasture improvement rate of return to the increase in production and the value of those productive units at a pasture life of 20 years and a failure rate of 10%.

Gross Margin ($/DSE)	Increasing in stocking rate (DSE/ha)			
	1	2	3	4
$50	1%	7%	12%	15%
$60	2%	10%	15%	20%
$70	4%	12%	19%	24%
$80	5%	15%	22%	29%

As he would expect, an increase in gross margin per DSE means a higher rate of return. Even at $50 a DSE ($15 below his 5 year average), James can justify the investment so long as everything else goes to plan.

James notes, however, that at any gross margin the return is marginal if he isn't able to achieve a minimum marginal increase of 3 DSE per hectare.

The final assumptions James wants to test is the costs of pasture improvement. He is budgeting for $425 in total costs for fertiliser, lime, herbicide, seed and any contractor costs. Because James is stocked at optimum, he also wants to understand the influence of the supplementary feed cost for stock that aren't able to graze the pasture for part of the establishment year (Table 4).

Table 4. Sensitivity of pasture improvement rate of return to the cost of establishing the pasture and the cost of feeding animals (whether it be on farm or through agistment) during the establishment year a pasture life of 20 years, failure rate of 10%, increase in stocking rate of 4 DSE/ha and a gross margin of $65/DSE.

Supp feed cost ($/DSE/week)	Total costs ($/ha)		
	$600	**$400**	**$200**
$5.00	9%	11%	13%
$3.00	14%	16%	19%
$1.50	18%	22%	28%
$1.00	20%	25%	34%

Even if the rest of James' plan works, at $5 a DSE per week in feeding costs the rate of return is below his threshold. For his costs of establishing the pasture at around $400 a hectare, he will need to keep costs at $3 a DSE or lower for supplementary feeding.

James is happy with the return at a total cost of $425 per hectare, however this will be on the basis that his inputs will be sufficient to achieve the production gains and persistence required to achieve those rates of return.

Pasture manipulation with fertiliser – a case study

James has assessed the return of re-sowing a pasture, but would now like to understand what is the lowest cost way of increasing pasture production.

When re-sowing pastures, a combination of improving soil fertility, ameliorating constraints such as acidity, and controlling weeds are employed to give the pasture the best chance of success in persisting. Fortunately, these strategies can all be employed without renovating a pasture, and have been proven to increase production of the existing pasture.

Therefore, James should analyse the economics of increasing pasture production through lower cost means such as improving the soil fertility.

A trial site at Bookham, NSW, provided key information about increasing fertiliser and stocking rates (REF?). In year 1, the site not fertilised carried 6.3 DSE/hectare, while the site that received superphosphate (250 kg/ha at start, average annual rate of 100 kg/ha for the subsequent 13 years) initially increased stocking rates to 11 DSE/hectare and gradually increased up to 15.1 DSE/hectare over subsequent 13 years.

The following assumptions were used (Table 4).

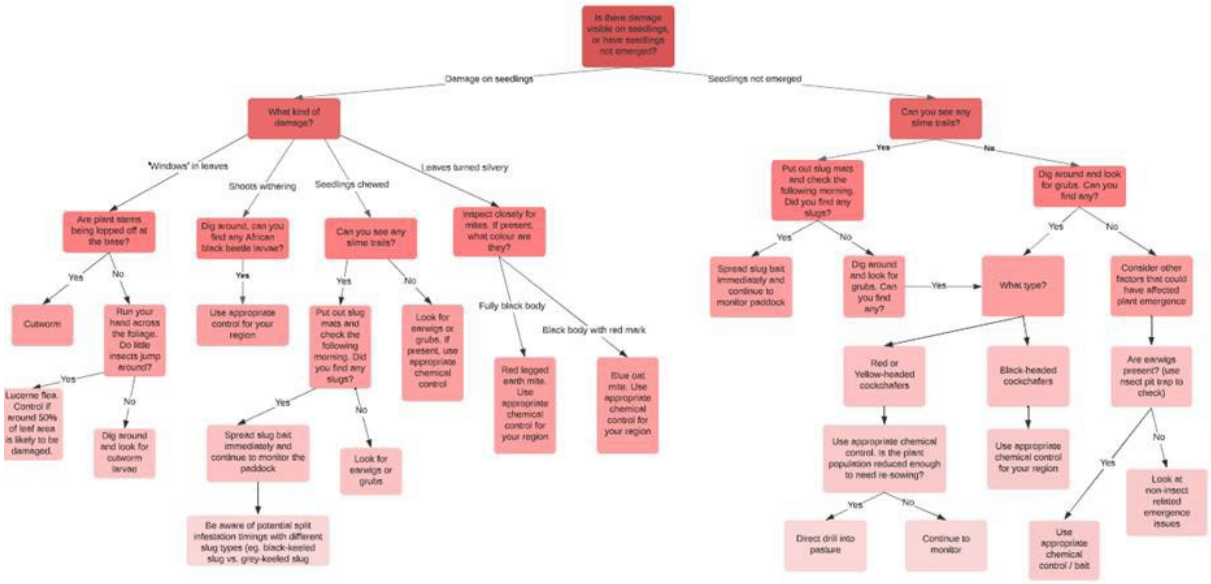
Table 4. Assumption used in Pasture Improvement Calculator for fertiliser only.

Expected life of the pasture	13 years
Chance of failure	0%
Current stocking rate	6 DSE/ha
Peak stocking rate after improvement	14.5 DSE/ha
Time to reach peak stocking rate	5 years
Year when stocking rate begins to decline	Year 14
Final stocking rate at the end of the pasture life	6 DSE/ha
Pasture available for grazing in first year	52 weeks
Cost of supplementary feed	$1.50/DSE/week
Gross margin per DSE	$65/DSE
Capital cost of livestock	$150/DSE
Capital application of fertiliser	$150/ha
Annual maintenance fertiliser	$60/ha

The internal rate of return on this investment was 50%.

Deliverers manual component developed by Laura Forward

Figure 13. Diagnosis of pest damage in new and established pasture (diagram courtesy Laura Forward)



Deliverers manual component developed by Sam Moorfield

Grazing

Observations:·

At establishment: For first grazing ensure the main tiller has at least 3 leaves. Apply the 'pinch and pull' test. This involves pinching a leaf between thumb and finger and twisting when pulling upwards to mimic a grazing animal. If the leaves break rather than the plants pull out, then it is safe for a first grazing (Figure 14). Conduct this test at least 6 times across the paddock.

Figure 14. The 'pluck' test method – a swift grab and pull of the leaves on the plant (Dairy NZ, 2021)

- Pastures should ideally be initially grazed with sheep (who nip graze) or young cattle rather than mature cattle (who first pull with their tongues before biting).
- For subsequent grazing, count the number of leaves on tillers before grazing.
- Next year: Count the number of leaves on tillers before grazing.

Benchmarks:

- At establishment: Passes the 'pinch and pull' test, with no plants pulled out from grazing.
- Subsequent grazing when species have reached **maximum live leaves** for the species (Appendix 8, Table 1).
- Next year: Graze at a minimum of 2.5 leaves recovered after the previous grazing.

Post sowing grazing management.

It is a common misconception that grazing should be avoided in the establishment year. The opposite is in fact true, appropriate grazing management during establishment can encourage tillering and root development. Grazing during establishment affects the lifetime persistence and productivity of the pasture.

Grazing can occur in winter once the pasture is adequately anchored. Once a plant starts growing its third leaf, it also begins to produce secondary roots which anchor the plant more securely. A simple 'pinch and twist' test can be used to determine when grazing can commence (see part 3 for technique). While there may be little fodder provided from these early grazings, the plant responds by increasing tillering and root growth (assuming adequate spelling follows grazing).

As discussed in Appendix 8, increasing tiller density and sub-clover leaf production is required create robust plants. Several 'nip' grazings may be possible over winter and early spring depending on seasonal conditions, however establishing pastures should not be grazed under dry growing conditions as this induces further plant stress.

The priority during spring and early summer of the establishment year is to maximise seed set and tillering of the grasses sown and minimise weed incursion. Subsequent grazing should be delayed until the following autumn but before the break in the season, where the pasture can be grazed to remove excessive dry material and reproductive tillers.

Do not cut new pasture for hay in the establishment year. Silage may be considered in areas where exceptional post sowing growth has occurred, and annual weeds are present (as the sown species will have time and moisture to recover after cutting).

Post sowing weed control

It is difficult to predict what weeds may appear after sowing. Therefore, anticipating what post sowing weed control may be required is impossible. However, the main pasture weed control techniques used in an established pasture should be avoided in the sowing year. This includes spray grazing, winter cleaning and spray topping.

Selective herbicides and grazing are the only options for post sowing weed control.

While there are a range of selective herbicides for use in pastures, many are not suitable for use in a pasture less than one year old. Therefore, pre sowing weed control is vitally important.

The suitability of the selective herbicide depends on the target weeds and desirable species present. In simple terms it is easier to remove grasses from broadleaf based pastures and broadleaf weeds from grass pastures. Unfortunately, a productive pasture typically has both desirable grasses (perennial ryegrass, phalaris, tall fescue, cocksfoot) and broadleaf plants (sub-clover, white clover) which limits the choices.

Each herbicide has specific requirements and impacts on desirable species. It is recommended to liaise with your supplier for specific details.

Meat and Livestock Australia have a useful resource on understanding the efficacy and safety of some selective herbicides:

- *How do I ...choose the appropriate selective herbicide for my pasture? IN FINAL STAGES OF PRODUCTION*

TASK: Hand out the MLA technote How do I USE SELECTIVE HERBICIDES???? and highlight any other points of interest.

The application of selective herbicides has both a direct and indirect cost. The direct costs relate to herbicide application and are typically in the order of $20 to $35/ha depending on the product choice.

The indirect costs refer to the loss of pasture production, from the removal of the weeds and the suppression in growth of the newly sown species. In a newly sown pasture this loss is likely to be small.

TASK: Complete the seed selection and rate row (conclusion and actions) for the table in Appendix 7.

Revisit and if necessary adjust row 11 (chance of pasture failure) in appendix 4 of the Evergraze
Pasture Improvement Calculator

7.6.2 Group Two – Emma Peters, William Sullivan, and Peter Brooker

Final report

Optimising sheep production by nurturing processor – producer relationships to improve on-farm practices through carcase feedback evaluation and education on carcase quality.

Project code: MLA project code = P.PSH.1189

Prepared by: Emma Peters - University of Adelaide
Will Sullivan - Craig Wilson and Associates
Peter Brooker - Outcross Agriservices

Date published: 6 December, 2021

PUBLISHED BY
Meat and Livestock Australia Limited
PO Box 1961
This is an MLA Donor Company funded project.

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government and contributions from the Australian Meat Processor Corporation to support the research and development detailed in this publication.

Abstract

This Project was undertaken to address the barriers between producers and meat processors and how feedback generated by processors can improve the quality of producer consignments. The underlying problem in the Australian sheep meat sector is that producers are currently being paid on quantity, not quality. To uphold our reputation of having lamb that eats well and tastes great, producers need to understand and benchmark where the eating quality of lamb is heading nationally, which is unfortunately bearing a negative trend. To solve this problem, producers and consultants from around Australia were invited to take part in the Meat the Market program. This program is designed to improve producer knowledge around Intramuscular fat (IMF) and lean meat yield (LMY) and how they can improve this to generate a higher return on their lamb. Producers taking part in the workshops at the Gundagai Meat processing plant will gauge an understanding as to what factors contribute to sheep meat eating quality and how to meet the highest possible market specifications. Producers were surveyed on their current and optimal on-farm performance within their sheep enterprise. Feedback was given on factors that need to be addressed to improve performance, as well as management strategies to overcome these limitations. It was evident that producers knew there was room for significant improvements on-farm. A limited understanding of eating quality factors such as intramuscular fat and lean meat yield can significantly affect the value and reputation of the product. Producers are now beginning to understand the sheep meat supply chain, and implement up to date technology and on farm practises to further improve the overall quality of their products. By taking part in these workshops, producers are becoming accustomed to factors which can impact the returns they receive on their lambs, as well as being guided to interpret carcass data feedback to make more informed business decisions on farm.

Executive summary

Background

- The main question being addressed is how we can assist farmers in adopting new technology and information generated by meat processors to make educated decisions on-farm to improve profitability.
- The main target audience is lamb producers because they are currently paid on quantity of lamb not quality.
- Due to new technology, farmers can now receive a premium for increased lean meat yield and intramuscular fat.
- The results of the research will be used to gain insight into participating farmers' businesses and determine whether they are adopting information provided to them in the MLA “Meat the Market” sessions to make changes to increase profitability.

Objectives

- To gain an understanding of producer knowledge so workshops can be tailor made to maximise understanding and adoption. .
- To provide support to producers to understand carcase feedback provided by the processor and help initiate on-farm practice change.
- To help producers achieve consistent production of high quality livestock that meet market specifications and are seen to be premium products in terms of meat and eating quality.
- Help farmers adopt slaughter feedback and use the data to make productive changes to their business.

Due to COVID-19 the program was severely disrupted resulting in only one of the three producer sessions being executed. This interruption has affected the program's ability to achieve results in the allocated time. The program will be continued in 2022 pending COVID-19.

Methodology

- A survey has been developed to gauge the current knowledge of the producers.
- The survey will gauge if the concepts taught during the first session have been put into practice.
- The producers were contacted via phone initially and then sent the survey via follow up email to be completed in their own time.
- The survey was delivered to 15 individual producers from 13 different farming businesses across NSW.

Results/key findings

This program was significantly affected by the COVID-19 due to lockdowns. The program is designed to be a hands-on learning experience which limits its ability to adapt to an online format. This disruption has affected the program's ability to generate positive results and key findings. One key finding that came out of the first session was the producer’s enthusiasm towards learning how they can utilise information provided to make positive change in their business. The surveys conducted will

allow facilitator's and their industry bodies to track the progression of adoption at the end of the program. This will show key findings to improve facilitation and adoption of information provided.

Benefits to industry

This project will benefit the industry by getting a better understanding of producer knowledge and program adoption. The program is designed to demonstrate to producers the value of slaughter feedback and greater compliance, to open up opportunities for high value products. The data generated from this survey will give a clear indication if the information provided was adopted on farm to practice generate change.

Future research and recommendations

The data generated from the research surveys give insight into how businesses are currently performing after one session. Due to COVID-19 the program was postponed, meaning that there is not enough data to provide the industry or stakeholders with valid information to make educated recommendations on future research and development.

Background

Background of proposed work and significance

Historically, data collection, analysis and interpretation within the agricultural industry, in particular the livestock sector has been put in the "too hard basket" because "we've always done it this way". With a steadily aging population of Australian producers coming to terms with traditional industry farming practices vs modern day practices, it has never been more critical to justify what is important in terms of maximising profitability and adhering to it.

The barriers that form around the adoption of new practices generally revolve around costs, labour, productivity and profitability, as well as the symbiotic relationship between each other. Some processors and producers, often those viewed as leaders in the industry, want to see the facts, figures and results before they make any long term decisions. The new practices need to be specific, measurable, achievable, realistic and timely (SMART) resulting in positive impacts on productivity and a reduction in expenses.

MSA technology and data has been very well documented and utilised in the beef industry, however, is yet to be utilised by lamb producers. The industry is preparing for this data to become available to sheep producers and as young industry professionals building our career, we are determined to improve the livestock industry by assisting in building better relationships between processor and producer to ensure premium sheep are being produced for slaughter.

With slaughter feedback currently only being distributed to producers by a handful of processors in the South-East of Australia including but not limited to; Thomas Foods International Lobathel (SA), T&R Pastoral Murray Bridge (SA), JBS Bordertown (SA) and TFI Tamworth (NSW) following slaughter of a consignment, the majority of this feedback only encompasses carcase compliance information and feedback on health and disease conditions detected at the time of slaughter (Dickason, 2016). It was suggested by Dickason in 2016, that slaughter feedback assists producers in improving sheep health and welfare, maximising farm productivity and increasing overall farm profitability, however, producers currently only have insight into potential on-farm management changes available to reduce identified adverse health conditions and are lacking insights on carcass quality traits impacting meat and eating quality.

Greater compliance, reduced animal health disease conditions and increased meat and eating quality can open up opportunities for the production of a higher value product. In order for sheep producers to supply meat processors with products that meet market specifications with greater consistency, and a higher standard of meat eating quality, producers must be able to locate, interpret carcass feedback data in order to make informed decisions both on and off farm.

This project is being developed to demonstrate the potential opportunity to assist producers in a group setting to locate carcass feedback data provided by the processor after slaughter, interrupt this data and be assisted in making informed decisions to improve the quality of their livestock to better meet market specifications by being provided additional information by industry professionals. This project will focus on the Gundagai meat processing plant in NSW as they develop 'Gundagai Lamb' - a dramatically different approach to the relationship between producer and processor - bringing a new level of value to the entire supply chain. Gundagai is currently implementing new technology to be able to collect relevant data relating to carcass information, in particular meat and eating quality. Not

only are GMP looking to improve meat and eating quality, they are looking to develop and build upon processor-producer relationships and also extend existing R&D projects and programs.

By developing and delivering group sessions with GMP producers to aid in the interpretation and implementation of their carcass feedback data, producers are able to take a step in the right direction to improving their production systems and overall farm profitability. The information provided by the feedback reports, once fully understood will initiate practice change resulting in increasing the supply of consistently high quality sheepmeat products that meet market specifications, benefitting the processor by increasing processing chain efficiency and marketable products as trimming and condemnation of carcasses will be reduced, the consumer's perspective on sheepmeat and the industry as a whole is greater consistency and meat quality will in turn contribute to a more enjoyable eating experiences and increase demand for sheep meat products.

Jim Meckiff, private consultant, on behalf of MLA and as a part of the Profitable Grazing Systems program has developed a three session workshop titled 'Meat the Market" - growing lambs to hit the mark every time, which will be delivered to existing GMP producers to aid in data interpretation. These sessions focus on carcase quality, specifically understanding the ins and outs of what contributes to meat and eating quality. A brief outline of the topics covered in each session is provided below:

Session One - Identifying the potential

- Live lamb assessment - fat scoring
- Carcass scoring
- Dressing percentages relating to fat score
- The effect of time off feed on dressing percentages
- Understanding the language
    - Dressing Percentage (DP)
    - Hot Standard Carcass Weight (HSCW)
    - Saleable Meat Yield (SMY)
    - Lean Meat Yield (LMY)
    - Eating Quality Score (EQS)
    - Intramuscular Fat (IMF)
    - Shear Force (SF5)
- Objective carcass measurement technologies
    - Current methods of determining LMY and their accuracy
    - Currently in use in industry
    - Technology being rolled out

Session Two - Understanding the customer

- Identifying the overall philosophy (goal) for the prime lamb enterprise

Session Three - Practical solutions to non-compliance

Managing LMY and EQ on farm through genetics

- What influences an animal's performance?
- Genetic tools for the producers
    - MLA Genetics Hub
    - LAMBPLAN
    - Ram Select

- On farm management
    - pasture quality and quantity
    - relationship between pasture quality (energy) and digestibility
- Feed conversion efficiency

Session one was delivered to GMP producers on the 30th March 202, however due to current restriction caused by the global pandemic of COVID-19, no other sessions have been delivered as of yet.

Objectives

With the implementation of a program like this that supports producers to understand feedback from the processor and help initiate on-farm practice change, specific measures need to be taken in order to determine whether progress is being made toward the end goal. The ideal outcome from this project would be the consistent production of high quality livestock that meet market specifications and are seen to be premium products in terms of meat and eating quality. The changes in livestock quality can/will be measured upon subsequent consignment, in which another load of sheep will be processed and improvements/deterioration will be observed within the carcass and consequently made aware in the feedback.

The outcome of this report is to determine which aspects of the first MLA "Meat the Market" session were well adopted, leading to greater understanding of production KPI's and the initiation of on-farm changes and which aspects need to be adapted and further expanded upon for full understanding.

Methodology

A survey has been developed to gauge the current knowledge of the producers, after attending the first session of the MLA 'Meat the Market' program (appendix 1). This survey will identify if the concepts taught during the first session have been put into practice. Producers have been asked to identify their current enterprise targets, actual performance achieved, and rate of performance, what needs to be addressed to improve the performance and management strategies or changes to overcome limitations against some common industry standards.

These surveys were to be asked via a phone call, however, due to the current time of year, producers are busy. After contacting the initial three producers, it was perceived that the survey would be better received via email, allowing producers to answer the questions in their own time.

The survey was delivered to 15 individual producers from 13 different farming businesses across NSW. The contact details for each producer were provided by Jim Meckiff. All producers have been allocated a number as a form of identification in order to remain anonymous and uphold confidentiality. The number system is as follows; producer 1, producer 2, producer 3, producer 4, producer 5, producer 6, producer 7, producer 8, producer 9, producer 10, producer 11, producer 12, producer 13, producer 14, producer 15.

Development of the Survey

Progress cannot be determined without tracking some specific, measurable, achievable, realistic and timely (SMART) performance indicators. These performance indicators are determined by a value that can change over time i.e. a monetary figure, a percentage, a specific gain over an indicated amount of time etc. for example lambing percentage may increase from 120% to 140% due to the implementation of new genetics into the flock in a subsequent lambing season.

The following performance indicators were determined to be most appropriate in gauging progress of the group;

- Stocking rate (Av. rainfall - 250mm)/25
- Number of ewes joined
- Lambing percentage (from ewes joined)
- Lamb growth rate (g/day)
- Lamb weight at sale (kg)
- Lamb cost of production ($/kg cwt)
- Animal health
- Fat score
- IMF%
- LMY%
- Carcase weight (kg)

The following questions have also been implemented into the survey to allowing producers to openly speak and to have individual opinions about the program;

- What do you want to get out of this workshop?
- What aspect of your business do you want to improve?
- What steps have you taken since the first meeting to improve this?
- Do you have any further questions or comments regarding the program?

These questions also allow us to observe the specific practice changes being implemented (if applicable) on farms since the first session to help improve the production of higher quality livestock. This will also help determine which aspects of the program, and more specifically the individual sessions have been most useful/most valuable.

Results

Survey Responses

The surveys were provided to producers on the 23rd of November 2021 and it was recommended that they were returned within a week. By the 3rd of December (10 days after dispersal), two surveys were returned.

The surveys returned from each producer have been condensed and are displayed below. To see the full survey layout, please refer to appendix 1.

Table 1: Producer 9's survey response.

	Your target	Actual performance achieved	Rate your performance 5 = good, 0 = poor	What needs to be addressed to improve the performance?	Management strategies or changes to overcome limitations
Stocking rate (DSE or ewe/Ha)	10	7	3-4	manage fat ewes	confinement feeding
Number of ewes joined	-	-	-	-	-

Lambing Percentage (from ewes joined)	170	145	3	foetus survival	ground cover
Lamb growth rate (g/day)	350	350	4	parasite monitoring	strategic drenching
Target market	trade	trade	4	early access to protein grains	creep feeding
Age of turn-off (weeks)	12	12 - 14	3	all of the above	-
Lamb cost of production ($/kg cwt)	-	-	-	-	-
Animal Health	-	-	-	-	-
Fat Score	3	3-4	3	-	-
IMF%	-	-	-	-	-
LMY%	-	52	-	-	-
Carcase weight (kg)	22	22	-	-	-

Table 2: Producer 3's survey response

	Your target	Actual performance achieved	Rate your performance 5 = good, 0 = poor	What needs to be addressed to improve the performance?	Management strategies or changes to overcome limitations
Stocking rate (DSE or ewe/Ha)	15 DSE/Ha	14.6 DSE/Ha	4	Ability to take advantage of better seasons	Building numbers
Number of ewes joined	1 Ewe/ha/100 mm	0.9 ewes/ha/100mm	5	-	-
Lambing Percentage (from ewes joined)	145	134	3	Joining dates, ewe body weight reduced	-
Lamb growth rate (g/day)	300	350 - 400	5	-	-

Target market	trade	trade		-	-
Age of turn-off (weeks)	13	15	4	-	-
Lamb cost of production ($/kg cwt)	Less than $3.50	$5.20	2	reduce animal health costs, increase numbers	-
Animal Health	Minimal conditions	Minor conditions reported	4	-	-
Fat Score	3	3	4	-	-
IMF%	>5%	3.3%	2	Genetics	Increase selection for IMF
LMY%	55%	54.4%	4	-	-
Carcase weight (kg)	20+	25.9	4	-	-

In addition to the value indicators asked in the survey, open ended questions were provided to allow producers to give individual feedback and make personalised comments on what they are ideally looking to gain from the workshop, what aspects of their business need improvement, what steps have been taken to improve their farming enterprise since the first workshop and a section to provide any further questions or comments regarding the program. The following responses were received.

1. What do you want to get out of this workshop?
    - To understand how best to maximise the productivity of the farm's lamb production.
2. What aspects of your business do you want to improve?
    - The consistency of our lambs and resulting kill sheets
3. What steps have you taken since the first meeting to improve this?
    - Closely monitoring the diet of lambs from birth, condition scores and growth rates.
4. Do you have any further questions or comments regarding the program?

Conclusion

The purpose of this report was to determine which aspects of the first MLA “Meat the Market'' session were well adopted, leading to greater understanding of production KPI’s and the initiation of on-farm changes. These changes would ideally lead to the consistent production of higher quality livestock that meet market specifications and are seen to be premium products in terms of meat and eating quality. The survey was also developed to determine which aspects need to be adapted and further expanded upon for full understanding.

The survey was developed to collect and collate measurement and evaluation data from each producer who attended the first session of the program. Producers were asked to identify their current

enterprise targets, actual performance achieved, and rate of performance, what needs to be addressed to improve the performance and management strategies or changes to overcome limitations against some common industry standards.

Two of 15 surveys were returned, therefore, specific key findings and clear underlying trends cannot be determined due to an insufficient sample size. However, from the two surveys returned, interpretations have been made and it is evident that some aspects of the workshop had been better received than others.

Key findings

As only two of the 15 surveys were returned in time to develop this report, specific key findings cannot be determined due to an insufficient sample size. However, the two surveys returned have been analysed and some interpretations of the responses have been made.

Overall, it can be observed that producers are aware of and understand where within their farming enterprises production losses are occurring and it is clear that they have some level of understanding of how to resurrect these to increase profit and reduce inefficiency. It is clear that of the two producers who responded that they understand how to access and interpret carcase feedback data provided to them by processing plants following consignments as they are aware of their current IMF, LMY and carcase weight values and have a clear target moving forward.

Based on these survey responses received so far, it has been observed that some aspects of the "management practices audit and action plan worksheet" haven't been received as well as others. This is evident as one of the two producers who returned the survey seem to be still unaware (indicated by leaving the section blank in the survey) of their current cost of production, number of ewes joined and animal health regime.

Benefits to industry

The program will assist producers in using slaughter feedback to implement practical change to their business. By helping producers understand and adopt the value of greater compliance, will increase the amount of quality meat produced that is eligible to be sold in premium markets. Producers that consign to GMP get paid based on quality over quantity (Gundagai Lamb) hence, overall increasing farm productivity. This will increase margins helping reduce key barriers to producing a quality product such as labour and production costs. By sending consignments to GMP, it helps increase data collection and accuracy, which will contribute to creating a lamb grading system similar to the MSA beef program.

The program will help producers understand the value of genetics and how it affects the quality and productivity of the stock. Producers get rewarded for producing a quality product through premiums for optimal levels of IMF and LMY.

Future research and recommendations

The program needs to look deeper into the correlation between certain traits like correlation between Terminal Carcase Production (TCP) and profitability. To help producers understand the value of genetics and how it can increase productivity, industry professionals i.e. livestock agents need to be educated on modern genetic selection as they hold key relationship power to generate industry change. The program could develop a shorter one day workshop that can be held in local farming

communities around Australia to educate and increase exposure to the program and the value of its teachings.

6.1 Group Evaluation

When working in group situations it is important to understand that each member has different levels of experience and different areas of expertise. As interns, it was understood that our level of experience and expertise would be lower than that of industry professionals and experts alike, hence we surround ourselves with a network of people to ensure the success of our project.

One major learning from undertaking this project was that it is paramount that time frames and specific deadlines are established in advance to ensure that all group members are able to deliver each and all aspects of the project on time. Along with deadlines, it is crucial that all group members establish and agree upon the standard of work that is to be delivered.

There have been several challenges encountered while undertaking this project including; inconsistent communication between group members. It is inevitable that particular times of the year are destined to be busier than others, depending on the particular field of the agricultural industry you are involved in. However, when working in a group, it is important to have good communication and be comfortable enough to rely on other group members and to indicate if and when you are overloaded. One group member should not be expected to contribute more than or compensate for the lack of contribution of another.

Being located in different states also poses a challenge when working in groups. Being able to meet and discuss project details in person is far more efficient than relying on online communication, working documents (google docs) and online shared file storage programs.

Due to COVID-19 the program was severely disrupted resulting in only one of the three producer sessions being executed. This interruption has affected the program's ability to achieve results in the allocated time and restricted group members' movement across borders to attend meetings and plant tours. The program will be continued in 2022 pending COVID-19 adaptations.

If this project was to be run again, several aspects would need to be re-evaluated and potentially executed differently. The allocation of tasks would be determined based on each group member's strengths and weaknesses and all group members would contribute to the project equally. The standard of work would be established early and deadlines would be discussed, agreed upon and adhered too. The specific project topic would be determined and would not change throughout the duration of the project. External personnel involved with the project i.e. company managers, project coordinators and group facilitators would be contacted earlier, allowing an appropriate time for documents to be returned on time.

7. Appendix

Appendix 1 - MLA 'Meat the Market' Survey

Producer survey

mla
MEAT & LIVESTOCK AUSTRALIA

Producer name: _____ Enterprises DSEs: _____ Female mature weight: _____

Number of breeding females: _____ Lambing date: _____ Weaning date: _____ Selling date: _____

	Industry target performance	Your target	Actual performance achieved	Rate your performance 5 = good, 0 = poor	What needs to be addressed to improve the performance?	Management strategies or changes to overcome limitations
Stocking rate (DSE or ewes/ Ha)	(Avg. rainfall – 250mm)/25					
Number of ewes joined	–					
Lambing percentage (from ewes joined)	Merino: 120–140% Crossbred: 140–150% Composite: 160–180%					
Lamb growth rate	Merino single: 250g/day Merino twin: 200g/day Crossbred single: 300–420g/day Twin: 250–350g/day Triplet: 200–250g/day					
Target market	Domestic Trade Export					
Age of turn-off	12–14 weeks from start of lambing					
Lamb cost of production ($/ kg cwt)	Less than $3.50					
Animal health	Minimal animal health conditions reported at slaughter					

Page 1 of 2

	Industry target performance	Your target	Actual performance achieved	Rate your performance 5 = good, 0 = poor	What needs to be addressed to improve the performance?	Management strategies or changes to overcome limitations
Fat score	FS 2–4					
IMF%	>5%					
LMY%	55–60%					
Carcase weight	18.1–28kg					

What do you want to get out of this workshop?	
What aspect of your business do you want to improve?	
What steps have you taken since the first meeting to improve this?	
Do you have any further questions or comments regarding the program?	

7.6.3 Group Three – Anabelle Ottery, Joanne Connolly, Karissa de Belle, and Harriet Dunne

Final report

Ag Technology for data capture, record keeping and storage: is there an ultimate package?

Project code: <MLA project code = X.XXX.nnnn>

Prepared by: Livestock Consulting Internship, Cohort 3

Date published: <Day, Month and Year - e.g.10 April 2015>

PUBLISHED BY
Meat and Livestock Australia Limited
PO Box 1961
NORTH SYDNEY NSW 2059

This is an MLA Donor Company funded project.

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government and contributions from the Australian Meat Processor Corporation to support the research and development detailed in this publication.

Abstract

The lack of accurate financial, genetic and herd data has been an ongoing issue within the agriculture industry. There are many available platforms and programs that have a wide range of data recording capabilities, uptake from producers has been limited and many still have no data recording system in place. This project aims to address the widespread industry issue by determining the cause of the problem and possible solutions. To begin a range of producers were interviewed to determine key barriers to accurate record keeping as well as their current data collection processes. It became clear through these interviews many producers struggled to accesses the information a d resources they needed to make sound decisions around data collection methodology. This shaped the project direction and resulted in contacting recording platforms to put together a comparison of available programs. It was found to be challenging to get responses from data companies, with many companies utilising generic inboxes to receive messages. The lack of response from the relevant data collection companies forced the project to shift direction towards providing guidelines and information around setting up a data recording system rather than a direct comparison of programs. The project will be beneficial to the industry if it succeeds in increasing the number of producers keeping accurate data through the information and support provided in the e-module.

Executive summary

Background

In the beef cattle industry, the level to which herd data is currently being recorded at the individual producer level is suboptimal. This has implications for producers, consultants, industry R&D and the wider industry as a whole. This project aims to address producer awareness around the importance and relevance of accurate data records to their business performance, which has been highlighted as a key barrier to accurate recording across the industry. The target demographic for the e-Module developed as the output of this project is beef cattle producers, and any employees working in a beef cattle business.

Objectives

The original objective of this project was to increase the general use and accuracy of herd data and record management on-farm via the development of an MLA e-Module to provide information around herd recording systems and comparison of available programs. This original outcome was not achieved, and the project aim was redirected to address the issue of insufficient accurate data capture and recording across the beef cattle industry by creating a resource which educates producers regarding the importance of data capture and recording, and the relevance of this to beef cattle businesses. The new direction of this project was achieved through the development of an e-Module.

Methodology

Initial research was conducted via producer interviews, to identify industry sentiment towards data capture and recording, and to determine key barriers to accurate record keeping. Two key barriers identified were a lack of understanding by producers of the importance and relevance of accurate data records, and difficulty in capturing information easily. In creating an e-Module which compared the features of available platforms, a template was developed and businesses with existing programs and platforms for data collection were contacted regarding participation in the resource.
Due to difficulty in obtaining information within the time constraints of the project, and an inability to get in contact with some of the businesses at all, the project objective was re-evaluated. The project was redirected to develop an e-Module which addresses the fundamentals of data collection and use in beef cattle businesses.

Results/key findings

The original aim of this project was to provide a resource which compares the existing platforms and programs and includes detailed information on the capabilities of each. This would allow producers to sort through the available options easily and find a data recording program that will suit their business and goals. This first aim unfortunately was not successful due underestimating the difficulty in gathering information by contacting the platforms directly. This meant the group didn't seek advice/assistance in getting into contact early enough in the process. To move forward with the project, it was decided to alter the direction slightly and aim to instead provide guidelines and information around data recording to producers through the use of an e-module. This redirection & new aim was successful and an e-module has been prepared which addresses fundamentals of why and how beef cattle producers should record data.

Benefits to industry

Recording and using data is critical to making any kind of business decision and is an essential tool for day-to-day management regardless of enterprise or business type. Having a resource that can guide

producers to a data recording system suitable to their operation will assist them in making informed management decisions and provide vital information on the health of their business. It is clear that accurate data recording in the industry is an ongoing problem, and due to the wide variety of operations there is no one size fits all. The e-module resource outlines the various types of data that producers can collect, and highlights the importance of this data being relevant their business goals and objectives. This makes the process of selecting a recording program more manageable and removes the key barriers to accurate data collection.

Future research and recommendations

Going forward, a resource which achieves this project's original aim would benefit the industry and stakeholders. It would provide detailed comparisons on available data recording systems and give producers a more in depth understanding of what data recording capabilities the individual platforms have. As mentioned previously, the main challenge associated with this is getting responses from the platforms in timely manner or even at all. It would be need to be long term project, and would involve a lot of correspondence and following up with various companies to provide information. Engaging MLA contacts along with other industry contacts earlier in the process would allow for direct contacts within the platforms and make the process of gathering information much smoother. Having a resource such as this available would also mean that it needs to be updated regularly, especially as new technology and platforms emerge and need to be included.

Background

In the beef industry, the level to which herd data is currently being recorded at the individual producer level is suboptimal. Failure to capture inter-property movements, and failure to annually reconcile herd numbers specifically, are key issues impacting data integrity. Where herd data is being recorded, the accuracy and completeness of these records is often insufficient. This has implications for:

1. Producers - Who don't have accurate data to use internally for analysis, or to provide to external consultants
2. Consultants - For whom it is difficult to effectively analyse/assess performance and make recommendations where accurate data isn't available
3. Industry R&D - Which requires accurate data for projects
4. Wider industry - Progression of the of the industry as a whole is limited as a result the above

The importance of record keeping is highlighted by MLA and DPI, however adoption and effective implementation of available resources is limited across the industry as a whole. Independent and timely advice on selecting and implementing available resources for data capture and recording is limited, and currently there is no independent resource where these existing tools can be easily compared and assessed to determine the best system for an individual business.

The objective of this project is to bridge this gap between existing resources and producers - assisting producers in assessing which system or combination of systems will suit their business, increasing overall adoption and more complete, accurate herd data records as a result. Increased accurate herd data capture and recording within the beef industry through:

- Increased awareness of the importance and the ability to capture accurate data & records
- Increased adoption of effective systems and platforms
- Increased access to information to help assist with the implementation phase and adoption of technology.

While the need for increased data collection by beef and sheep producers was identified in MLA Project Report "Benefit and cost of performance recording in the beef and sheep studs" published 3rd December 2019, no existing R&D projects have addressed the gap in implementation, and there is currently no independent resource where these existing tools can be easily compared and assessed to determine the best system for an individual business.

This project intended to benefit cattle producers in Australia who want to maintain accurate herd records for internal and external use by creating and understanding record keeping requirements and providing support and diagnostics unlike current systems that are solely motivated by sales.

The original aim for this project is to develop a resource where producers are able to access information on

1. What data to record and why it's important
2. A list of programs/apps/devices currently available for data capture
3. Which system would likely work best for them, with access to pros and cons, tips and tricks for each system
4. If none of the available programs are suitable, pointers on developing excel spreadsheets

There is a need for a resource such as this, as many systems and platforms are already available and it is a matter of finding one suitable to individual business and its goals. Independent and timely advice around different management and record keeping software has been limited. This project aims to bridge the knowledge gap and lead to increased adoption and effective utilisation. By providing resources and information to producers via an e-Module, this information will be more accessible and relevant to any cattle producers interested in starting herd data collection or looking to make their current system more effective

Objectives

The original objective of this project was to increase the general use and accuracy of herd data and record management on-farm. In order to achieve this, the aim was to develop an MLA e-Module to provide information around herd recording systems and platforms and comparison of these available resources. This original objective was not met successfully.

The project aims were redirected due to the inability to successfully meet the original objective. The new objective for the project still aimed to address the issue of insufficient accurate data capture and recording across the beef cattle industry. Specifically, the new objective for the project was to create a resource which educates producers regarding the importance of data capture and recording, and the relevance of this to beef cattle businesses. This was achieved by via the development of an e-Module aimed at producers which outlines the importance of data, the types of data that can be recorded, and the relevance of this to their businesses.

Methodology

Interviews were conducted with beef producers (n=17) from across Australia. Producers were questioned on what they thought the importance of data collection was and what their current methods or procedures entailed. The key outcomes of these interviews were;

- *The majority of producers interviewed either did not see the importance of accurate records, or did view them as important, however found it difficult to capture the information easily without needing to double enter data*
- *Different operations, business objectives, and requirements indicated that one platform or method for data collection and recording would not be suitable for all.*

A list of features available across different data capture and recording systems and platforms was compiled and a template for participating businesses to record their particular platform's ability to perform those features was created. Businesses were contacted via direct contact where possible, though in some cases General Enquiry submissions on websites were used where a direct contact for the business could not be obtained.

Due to difficulty in obtaining information from the businesses we hoped to include in the resource prior to the project deadline, project objectives were reassessed. The aim of the new objective was to still produce a resource that would address the issue of inaccurate or limited data capture within the beef industry.

One of the key outcomes from the initial interviews was that a percentage of producers did not see the importance of accurate data capture, and the new aim was to develop a resource which addressed this. An e-Module which outlines the various types of data producers can collect and highlights the relevance of this data to meeting their business goals and objectives was developed.

Results

It became clear in discussion with various producers that there were significant knowledge gaps around herd and farm record keeping. Explaining what potential systems, programs, apps and devices are available will help to bridge some of the gap, but explaining the power of data collection is also vital in bridging the identified knowledge gap.

The original project aim of producing an e-Module which facilitated comparison of available programs, apps and devices and their features was not successful. This was due to the inability to obtain information from the businesses that we hoped to include in the resource within the project time-frame. A significant attempt was made to contact multiple platforms, with only limited

responses received by the project facilitators. All platforms received a phone call to instigate initial contact which was followed up by an email, including a questionnaire to fill out on the details of the features their system/platform. Limited responses were received for this questionnaire. The difficulty in getting information back in time, or in many cases, getting in direct contact at all with the business was underestimated. As a result, advice and assistance was not sought early enough in the process to achieve this objective in the required time-frame.

Redirection of the project to develop an e-Module which outlines the various types of data producers can collect, and highlights the relevance of this data to meeting their business goals and objectives was achieved. Although the initial target was not able to be achieved there is significant substance in the content produced from the project which is especially important in reinforcing how valuable this data collection is to producers. The e-module generated will allow producers access to a resource before they implement data capture software. The purpose of this module is to prevent them from being 'sold' an expensive piece of equipment that is not suitable for what their business needs are.

Conclusion

5. 1 Key findings

5.1.1 Insights

A large percentage of producers either don't see the importance of accurate records, or do view them as important, however find it difficult to capture the information easily without needing to double enter data. The resulting lack of sufficient accurate data capture across the beef cattle industry has implications for producers, consultants, industry R&D and progression of the industry as a whole. A 'one size fits all' solution is not possible, due to the vast range in business goals and objectives, operating environments, and requirements for access by multiple people or people with differing levels of financial and data management skills and acumen.

5.1.2 Implications

The e-Module produced will address the issue of producers not seeing the importance or relevance of accurate data records to their business. It is hoped that increasing recognition of the importance and relevance of accurate data records in beef cattle businesses, will increase the commitment of producers to capturing and recording accurate data, with the assistance of available existing platforms where applicable.

5.1.3 Key Findings

Key barriers to sufficient accurate data records in the beef cattle industry are:

- A lack of recognition by producers about the importance or accurate records, and the relevance of this to their businesses
- Difficulty in capturing accurate data easily, and without the need for double entry\

Difficulty in getting in contact with various data capture and recording systems/platforms is noted. This also raises questions around the challenges faced by producers who are willing and looking to implement available programs, in being able to get in contact with the business providing them and obtain relevant information.

5.1.4 Benefits to Industry

Recommendations for practical application of the projects insights and implications for the red meat industry include;

- Engagement with stakeholders actively working with producers e.g., industry consultants and other professionals who would benefit from producers having more accurate data records
- Using industry connection/engagement to increase awareness of the e-Module as a starting point to increase producer knowledge of the importance and relevance to their business

Benefits to the beef cattle industry include;

- It has been highlighted by producer interviews that limited recognition of the importance of accurate data records has been a barrier to sufficient accurate data capture across the industry. The e-Module aims to address this, with a focus on the practical relevance to beef cattle businesses.
- Understanding business performance will allow produces to make more profitable decisions using information to inform decision making.

Future research and recommendations

The recommendations around future research and development in this area would be to work towards completing the original aim of the project. This would go a step further than the current e-Module in assisting producers in selecting a data recording system suitable for them, as there would be more depth and information on the individual programs.

- Complete original aim with help of MLA and industry contacts
- To get producers that do no record keeping onto basic systems to provide accurate and relevant data

MLA eLearning Module Creation Template

Business Unit	RDA
Sub-Program	
Author name	
Intended Live Date	Click or tap to enter a date.
Module Title	Fundamentals - Data in Beef Cattle Businesses
Parent theme (if known)	
Prerequisites	no
Prerequisites (if yes)	
Progression flow	Free form
Level	Introduction
Accessibility	All - no login required
MLA owned IP 100% - Content	Yes
MLA owned IP 100% - Images	Yes
Module Overview	The purpose of this module is to give producers some background knowledge on the different types of data that a business can capture. The intention is for them to be able to have more of an overview and background on data recording and capture prior to implementing new systems, along with ensuring they understand it is critical to define the business goals and objectives prior to implementing the system.
Learning Outcomes	• Overview of the key types of data that can be collected and used for beef cattle businesses: financial, production, genetic • Provide a background into the importance of data capture and setting business goals and objectives before deciding the method of data capture • Give insight into the way that data can be captured for the business
Additional resources	Feed budgeting What are Estimated Breeding Values? How do I set a breeding objective for my beef herd? Tropical Cattle Temperate Cattle BREEDPLAN Help Centre

Choose an item.
Choose an item.
Choose an item.

Choose an item.

Module – Topic 1 - Lesson 1

Topic Title	*The role and types of data in beef cattle businesses*
Lesson Title	*Overview*

Introduction:

Recording and using data is critical to making any kind of business decision and is an essential tool for day-to-day management regardless of enterprise or business type. In agriculture businesses, financials are often reserved for rain days and are a source of dread for most producers. However, understanding your financial, production and genetic data is vital to the ongoing success of your business.

Financial data:
Financial data deals with the business in its entirety, composed of the three pillars - income statement, cashflow statement, & balance sheet. When year on year reports are compared, the information becomes a powerful decision-making tool. Not only does this financial data show how the operation is performing, but it can also allow you to understand the reasons why. Being able to generate a snapshot of the financial health of your business can allow you to identify weaknesses and be a proactive manager. It facilitates decisions about where to direct resources and can make accessing finance easier.

Production data:
Herd recording proves to be an ongoing problem within the industry, with many producers unable to reconcile their herd numbers annually. Whilst there are some challenges when recording herd data, developing a robust system that is used consistently is vital to understand herd performance. Part of the solution to this is to capture data that is relevant and useful to the business in the decision-making process and aligns with the current direction and goals. This means that the amount and type of data collected needs to be specific to the requirements of the individual business to avoid collecting data that is unnecessary and therefore time consuming.

Genetic data:
Consistently striving to improve the genetics of a herd is essential to increasing the productivity and profitability of an operation. Investment in genetics can address many key aims of the business including meeting market requirements whilst improving feed efficiency and reproduction rates. Estimated Breeding Values (EBVs) provide an estimate of genetic merit for a given trait and can play a key role in improving herd genetics. They are used often by stud operations and allow producers to compare animals within their herd or to see where their herd ranks on genetic merit compared to others in the same breed. There are many different values that can be measured for, and it is highly dependent on the operation as to which EBVs will be relevant.

Enterprises
The level to which data is collected and kept separate determines the level to which producers can analyse their performance. If all data is kept at a whole farm level, with no ability to differentiate between sheep versus cattle for example, it can be difficult to analyse the performance of the sheep operation, independent of the cattle operation.
It is important to consider the segments or enterprises of your operation, and whether analysis of performance at that level is relevant to your goals and objectives.
The ability to analyse the performance of different segments or enterprises, facilitates:

- Analysis of the relative performance of different enterprises and their contribution to overall business profitability e.g., how the sheep operation is contributing compared to the cattle operation
- Identification and monitoring of trends in the relative performance of different enterprises over time e.g., feed requirements and cost of meeting those requirements for one enterprise over another in drought years
- Management decisions – use of data on the relative performance of different enterprise to make management decisions for example, choosing to take on agistment stock instead of purchasing trade stock or vice versa
- More accurate budgeting. The ability to validate budget assumptions at the enterprise level as opposed to the whole farm level allows producers to account for enterprise mix, for example, budgeted income and expenses are likely to be different for a breeding enterprise compared to that of a trading enterprise. Having historical data at this level would allow producers to account for a shift from a 50% breeding, 50% trading split to a 70% breeding, 30% trading split for example in their budgeted income and expenses.

It should be noted that it can often be difficult to segregate exact expenses for each enterprise, particularly where two enterprises interact, for instance grazing stock on grain stubbles. However, an attempt to capture the enterprise specific direct costs should be considered. Accurate production data records are an important tool that assist in differentiating or allocating expenses between enterprises, for example use of animal treatment records to differentiate between sheep and cattle animal health expenses.

- Quiz:

Quiz title	*The role and types of data in beef cattle businesses*
Type	Fill in the blank
Progression type	Choose an item.
Pass level	Choose an item.
No. Attempts	Choose an item.

- Question 1: **Recording and using _____is critical to making any kind of business decision and is an essential tool for day-to-day management regardless of enterprise or business type.**

  Answer

  - Data

- Question 2: **The three main types of data that can be recorded in beef cattle businesses are _____, _____ and _____**

  Answer (order not important)

  - Financial
  - Production
  - Genetic

- Question 3: **It is important to consider the segments or enterprises of your operation, and whether analysis of performance at that level is relevant to your _____and _____.**

Answer (order not important)

- Goals
- objectives

Module – Topic 2 - Lesson 1

Topic Title	*Types of Data – Collection and Uses*
Lesson Title	Financial Data

- Content (include images where required):

Record keeping and data management is an ongoing issue for the industry, understanding whole business financial performance is vital to understanding the business you manage.

Your accounting software will give you an insight into how your business is performing through the various reports it can generate. There are three major statements that provide insight into business performance, the income statement, cashflow statement and balance sheet. Altogether these are known as the three pillars and analyze the same business from multiple angles.

The Income Statement

- Determines the profit or loss of the business
- Considers several non-cash costs including inventory change, depreciation, and owner wages
- When multiple years of this statement are compared some powerful information can be extracted that can inform business decisions

The Cashflow Statement

- shows the movement of funds through the business for a period,
- Can be recorded on an annual, half-year, quarterly or monthly
- The cashflow statement can be separated into operational, capital expenditure, investing and financing expenditure. When this is compared for consecutive years a clear picture of where the business' income is generated, and expenditure used.

Balance Sheet

- This is also known as the statement of position and shows the assets and liabilities of the business
- This shows the equity position of the business as well as how leveraged the business is

Cashbook recording can also assist in keeping track of expenses to understand the business better. It is a financial journal that allows all receipts and disbursements to be recorded in chronological order as the balance is updated on a continued basis and reconciled to bank statements each month. It is an important part of bookkeeping that is especially helpful for monitoring spending and making it efficient to determine cash balances at any point in time. There are many programs and software available for bookkeeping which can include features such as live bank feeds, budgeting capabilities and automatic payment options. Having cashbook recording set up can make budgeting easier by being able to refer to previous year's expenditure and breakdown the costs.

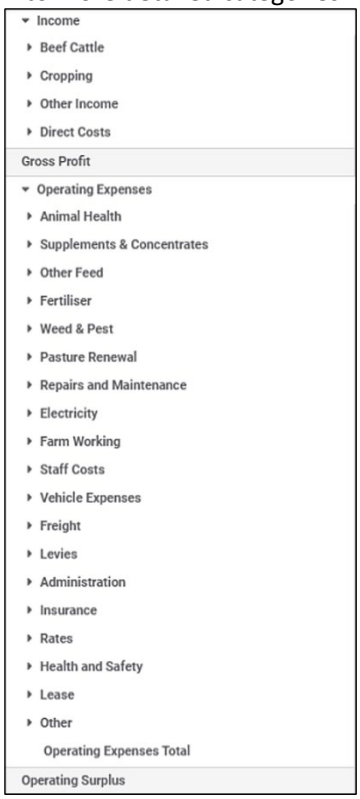
Budgeting can be used for:

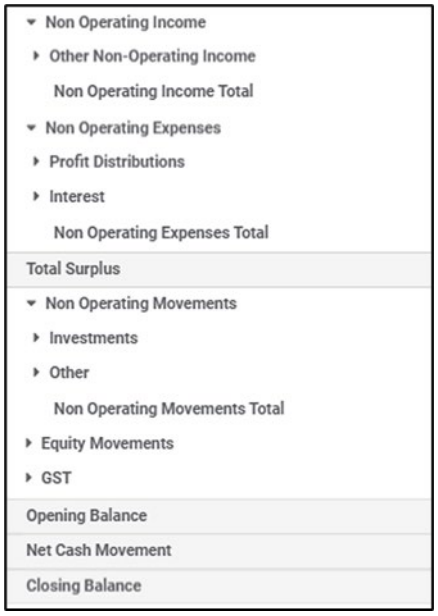
- Forecasting scenarios
- Setting realistic targets for the business
- As a tool for decision-making
- Examining the feasibility of capital improvements or an acquisition

How to start?
A good set of chart of accounts:

- You will have a chart of accounts in your accounting software, review these and ensure they are set up in a way that allows you to extract information about your business
- Work closely with your accountant to do this, remembering as the manager of a multimillion-dollar business your accounting software should provide you with information to make business decisions

Below is an example of the main headings commonly used in the chart of accounts for a beef cattle operation. Additional subheadings can also be added underneath these to breakdown expenses & income into more detailed categories.





Using financial data in combination with herd data can provide powerful insight into the performance of the operation. This information can be used in tandem to pinpoint the strengths and weaknesses of the business. As mentioned above, there are a multitude of programs that have the capability to record and process this data and make it meaningful and easy to manage. With many options available, all with varying levels of detail, it is important to choose something that is user friendly and suited to the needs of the specific business. This will enable consistent entries, which as stated above is essential to establish a quality data recording system

Want more?
Consider attending a BusinessEDGE workshop where this is explored in more detail

- Quiz:

Quiz title	Financial Data Summary
Type	Multiple Choice (single answer)
Progression type	Must attempt to progress
Pass level	100%
No. Attempts	3

  - **Question 1: What are the three types of statements when analysing financial data?**
    - Answer 1: The Cashflow Balance Sheet, The Total Income Sheet, The Business Assessment Sheet
    - Answer 2: The Income Statement, The Cashflow Statement and The Balance Sheet.
    - Answer 3: The Balance Sheet, The Total Asset Sheet, The Income Statement
    - Answer 4: The Cashflow Assessment, The Balance Statement, The Income Balance.
    - Correct Answer: The Income Statement, The Cashflow Statement and The Balance Sheet.
  - **Question 2: What is Cashbook Recording?**
    - Answer 1: A financial journal that allows all receipts and disbursements to be recorded in chronological order as the balance is updated on a continued basis and reconciled to bank statements each month.
    - Answer 2: A record of the cash in and out over a twelve-month period.
    - Answer 3: A mixed record of financials for the month, that can be reconciled to bank statements.
    - Answer 4: A financial journal that can be entered in whenever possible to keep a record of the cash in and out for the month.
    - Correct Answer: A financial journal that allows all receipts and disbursements to be recorded in chronological order as the balance is updated on a continued basis and reconciled to bank statements each month. Other inclusions (video etc.): N/A

Module – Topic 2 - Lesson 2

Topic Title	*Types of Data – Collection and Uses*
Lesson Title	Production Data

- Content (include images where required):

Production data records are commonly used for internal monitoring and management, budgeting, and benchmarking.

Internal monitoring and management

- Identifying trends and anomalies e.g., comparing the profitability of different fodder crops.

- Use of data to facilitate management decisions e.g., use of historical reproduction data to make decisions around joining practices.
- Monitor the outcomes of management decisions e.g., monitoring the impact of weaning practices on weight gain in weaners.

Budgeting

- Historical production data can be used to validate budget assumptions e.g., budgeted natural increase, or budgeted sale weights

Benchmarking

- Where you are participating in a benchmarking group, production data records will likely be required. The level of detail will vary depending on the type of benchmarking and group.
- Where possible, you should ensure they are clear on the data requirements of any benchmarking or other analysis they are looking to participate in prior to commencing the period they wish to benchmark/analyse to ensure they any relevant data to the level of detail required.

Options for Recording Productivity Data

When recording production data, particularly that relating to animals it there is a number of ways to capture it.

- Gross Data
  - When information is captured on the whole herd, for instance total number pregnant vs total number empty
  - Often this information can be recorded by using a 'notebook' tally or yard sheet and then transfer to a spreadsheet at a later date.

- Individual Animal Data
  - When each animal is identified using either a management tag with a number
  - Use the NLIS tag and RFID number to identify the animal
  - Often both can be used to increase accuracy of the data and prevent losses due to lost tags
  - There are a number of herd recording platforms that can be utilised, alternatively data can be entered into an Excel spreadsheet.

Herd Reconciliation

Reconciling the herd numbers is the process where a livestock schedule is utilised to ensure that the herd inventory is correct.
The herd rec can be done according to a financial year or a calendar year, it often depends on the environment that the business operates in and when peak calving/ weaning occurs.

Livestock Schedule

The livestock schedule is a place where all numbers recorded are reconciled to ensure that all animals are accounted for. It can be generated using a simple spreadsheet style entry program such as Excel.

- Opening numbers
  - The opening numbers are derived from the closing numbers of the previous year

- Purchases
  - Any cattle that are bought in the 12-month period, therefore the were not previously included in the schedule

- Natural Increase
  - Animals that are born within the 12-month period.

- Sales
  - Animals that are sold off the property

- Deaths
  - Animals that have died on the property

- Closing Numbers
  - The closing numbers are simply the opening numbers adding purchases and natural increase, subtracting sales and death.

Class	Opening	Purchases	Natural Increase	Deaths	Sales	Closing
Breeders	500	50(+)	0(+)	25(-)	50(-)	475
Herd Bulls	15	3(+)	0(+)	1(-)	2(-)	15
Weaners	100	0	450(+)	20(-)	250(-)	280

  - The closing numbers are required for the business balance sheet therefore it is very important that they are as accurate as possible, because it is difficult to assess a business with inaccurate information.

Female Data

When recording individual animal data, the females will generally have more information recorded than the male cattle due to the fact that they reproduce and often stay in the herd for a longer period of time. Suggested data to record is listed below.

- Body Condition Score (BCS)
  - Ensures that breeders have enough condition to be able to provide for the calf as well as get back in calf the following year.
  - Scale of 1-5, with 1 being very poor condition and 5 significantly overweight, it is ideal to have cows in condition 3-4.

- Udder
  - Determines if she produced a calf for the year, she could be pregnant every year but never actually raise the calf.

- Pregnancy Status
  - Pregnant/empty

- Foetal age
  - Age of the calf which can be used to generate estimated calving dates

- Birth Year/Year Number
  - Required to determine cows that need to be culled for age given that breeder mortality increases significantly once they are over 10 years.

- Sex
  - Female
  - Female spay

Bull Data

Information that can be recorded for herd bulls is listed below.

- Body Condition Score (BCS)
- Birth Year/ Year number
- Sex
- Scrotal Circumference (cm)
- Semen Test
    - Semen Motility – a percentage of progressively motile sperm at crush side. >30% is required to be a suitable herd sire.
    - Semen Morphology – how the sperm are 'put together' identifies if there are any abnormalities with the sperm. >60% is desirable.
    - Genetics – please see below.

Reproduction Data

Common uses for reproduction data include but are not limited to;

- Identification and monitoring of trends or anomalies e.g., herd fertility over time
- Facilitation of management decisions e.g., partitioning of the herd into early and late calvers and early detection of disease.
- Monitor the outcomes of management decisions e.g., implications of joining practices on PTIC rate
- Validation of budget assumptions e.g., budgeted natural increase

Depending on your business' goals and objective, a combination of some, all, or additional information to the following may be relevant for their reproduction records.

- Joining details
    - Number joined
    - Number of sires
    - Length of joining period
- Pregnancy testing records
    - Number pregnant vs empty
    - Individual animal record
- Foetal aging
    - Determines estimated birth date of calves
    - Marking/branding numbers
    - Weaning numbers
    - Weaning weights

Weight data

As technology develops, the ability to weigh stock more frequently and with less stress on the stock is increasing. This ability varies from operation to operation depending on the technology and infrastructure there is available.

Common uses for weight data include but are not limited to;

- Identification and monitoring of trends or anomalies e.g., weaning weights over time
- Facilitation of management decisions e.g., planning the timing of sales
- Monitor the outcomes of management decisions e.g., impact of weaning practices on weight gain, or the efficacy of different supplements and rations

- Validation of budget assumptions e.g., budgeted average daily gain (ADG), or sale weights

Depending on goals and objective, a combination of some, all, or additional information to the following may be relevant for their weight records.

- Recording weights;

    - At weaning
    - On arrival (purchased cattle)
    - Prior to sale
    - At various times when cattle are put through the yards e.g., treatment or drafting
    - Details of the type of pasture, crop or ration the cattle have had access to

Purchase data

Common uses for purchase data include but are not limited to;

- Identification of trends or anomalies associated with cattle sourced from particular vendors e.g., disease or performance
- Historical data can be used to identify trends in production, and profitability of particular stock classes or weight ranges
- Use of data to facilitate management decisions, e.g., decisions around where to purchase cattle from, or taking pre-emptive measures where there have been issues in the past

Depending on the goals and objective, a combination of some, all, or additional information to the following may be relevant for their weight records.

- Date
- Class of stock e.g. heifers
- Number of head
- Weight

Grazing Data

Common uses of grazing data include but are not limited to;

- Feed budgeting
- Analysis of the performance and profitability of different fodder crops or pasture bases
- Facilitation of management decisions e.g., stocking decisions or fodder crop choice
- Monitor the outcomes of management decisions e.g., impact of rest period length on overall grazing value
- Validation of budget assumptions e.g., realistic stocking rate on different fodder crops or pasture bases

Depending on a producer's goals and objective, a combination of some, all, or additional information to the following may be relevant for their grazing records.

- *Stock movements*
    - The date of any stock movements on or off paddocks
- Stock details:
    - Number of head
    - The class of stock e.g. weaners
    - Average weight of stock when moved on and off the paddock
- Feed base details

- Crop type
- Pasture type
- Supplementary feed
- Details about the type and volume of any supplementary feed provided

- Quiz:

Quiz title	Production data in beef cattle businesses
Type	Multiple Choice (multiple answer)
Progression type	Must attempt to progress
Pass level	100%
No. Attempts	no limit on attempts

- **Question 1: What are common uses (3) for production data in beef cattle businesses?**
  - Internal monitoring and management
  - Validating budget assumptions
  - Participation in benchmarking
  - Influencing industry indicators such as the Eastern Young Cattle Indicator (EYCI)
  - Production data is only relevant to stud operations and is not relevant for commercial beef cattle businesses

  Answer

  - Internal monitoring and management
  - Budgeting
  - Benchmarking

- **Question 2: Which of the following options (4) are examples of production data you can** collect in beef cattle businesses?
  - Body Condition Score (BCS) of bulls prior to joining and following joining
  - Weaning weights
  - Details about the pasture base stock were grazed on, and the time they were held in that paddock
  - Opening and closing stock numbers for the calendar or financial year
  - Income statement

  Answers

  - Body Condition Score (BCS) of bulls prior to joining and following joining
  - Weaning weights
  - Details about the pasture base stock were grazed on, and the time they were held in that paddock
  - Opening and closing stock numbers for the calendar or financial year

- **Question 3: Which of the following options (3) correctly describe how production data can be used in beef cattle businesses?**
  - Pregnancy status records can be used to assess the implications of joining practices such as length of joining or BCS of breeders at joining
  - Purchase data records can be used for identification of trends or anomalies associated with cattle sourced from particular vendors such as prevalence of particular diseases or animal performance
  - Grazing data can be used to validate budget assumptions such as realistic stocking rate on different fodder crops or pasture bases
  - Bull data such as semen motility can be used to facilitate management decisions such as partitioning of the herd into early and late calvers
  - All of the above

  Answers

  - Pregnancy status records can be used to assess the implications of joining practices such as length of joining or BCS of breeders at joining
  - Purchase data records can be used for identification of trends or anomalies associated with cattle sourced from particular vendors such as prevalence of particular diseases or animal performance
  - Grazing data can be used to validate budget assumptions such asrealistic stocking rate on different fodder crops or pasture bases

---

Module – Topic 2 - Lesson 3

Topic Title	*Types of Data – Collection and Uses*
Lesson Title	Genetic Data

- Content (include images where required):

Estimated Breeding Values

Estimated Breeding Values (EBVs) provide an estimate of an animal's genetic merit for a given trait, and facilitate producers in predicting the genetics an animal will pass on to its progeny
The following videos outline what EBVs are, how to go about setting a breeding objective for your herd, and what beef indexes are:

What are Estimated Breeding Values?
How do I set a breeding objective for my beef herd?

EBVs provide producers with insight into a range of traits, from birth weight, to gestation length, to docility. Table 1 below summarises the various traits EBVs are currently able to provide insight into.

Table 1: Traits that BREEDPLAN currently produces EBVs for

Weight	**Fertility/Calving**	**Carcase**	**Other**

Birth Weight Milk 200 Day Growth 400 Day Weight 600 Day Weight Mature Cow Weight	Scrotal Size Days to Calving Gestation Length Calving Ease	Eye Muscle Area Fat Depth Retail Beef Yield Intramuscular Fat Carcase Weight Shear Force	Docility Net Feed Intake Structural Soundness Flight Time

Access the following resources to learn more about

- Getting started with EBVs
- Using breeding values to select for traits
- Using breeding values to find bulls on BREEDPLAN

Resources:

- Tropical Cattle
- Temperate Cattle

BREEDPLAN is the genetic evaluation system used in Australia to produce EBVs for beef cattle.
The BREEDPLAN website has lots of resources for producers:
BREEDPLAN Help Centre

DNA Parent Verification

- Identify an animal's parents by taking a skin or hair sample
- Helps to identify genetic lines of more production animals
- Usage of SNPs (single nucleotide polymorphism) to identify the animal's sire and dam.

- Quiz:

Quiz title	Genetic data in beef cattle businesses
Type	Fill in the blank
Progression type	Must attempt to progress
Pass level	100%
No. Attempts	no limit on attempts

- **Question 1: EBV is the abbreviation used for_____ _____ _____**

  Answer
  - Estimated Breeding Value

- **Question 2: EBVs provide an estimate of an animals _____ _____ for a given trait**

  Answer
  - Genetic Merit

- **Question 3: _____ is the genetic evaluation system used in Australia to** produce EBVs for beef cattle.

  Answer

- BREEDPLAN

Module – Topic 3 - Lesson 1

Topic Title	*Fundamentals of Data in Beef Cattle Businesses*
Lesson Title	*Summary*

- Content:

To summarise, there is no one size fits all. Its about determining what your business objectives are and defining what the best options available. The key is to define this before choosing the program or system that you are going to utilise as this can often prevent the purchase of the wrong equipment. There is a broad range of programs and equipment out there but having clear goals and objectives will ensure that the process is a lot smoother.

- Quiz:

Quiz title	Module Summary
Type	Multiple Choice (multiple answer)
Progression type	Must attempt to progress
Pass level	100%
No. Attempts	no limit on attempts

- **Question 1: Key aspects (3) to data recording in beef cattle businesses include:**

  - Evaluation of the business goals and objectives to determine the data and level detail to relevant to your business
  - Ensuring that you understand what data you want to capture before implementing the technology/ latest software
  - Assessing the broad range of programs available in order to determine what the best option is for your business.
  - Quantity - Always record as much data as possible
  - Use of a commercial program or system to record your data