Final report

Metric and data stocktake to support the Australian Beef and Sheep Sustainability Framework

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Abstract

The Australian Beef Sustainability Framework (ABSF)and Sheep Sustainability Framework (SSF) proposed a stocktake of the data sources used to report against the Frameworks' indicators and metrics.

This project was commissioned to analyse the current suite of data sources, to identify existing risks and explore the potential for short and long-term data opportunities. The project focused on two main tasks:

- An audit of the currently utilised data sources based on a desktop audit, and
- A data stocktake based on consultations and additional desktop research.

The project identified the current data risk posed by its current set of sources, and the effect and potential in the broader data landscape. It consolidated these into 3 drivers – indicator instability, methodology instability, and perception. These account for the risks in the data sources: reliability, timeliness, longevity, effort, compliance, and credibility.

The report identifies a set of short and long-term actions that can be taken to mitigate risk in the short term and improve integrity and efficiency in the long term. It also identifies where there is residual risk. This provides a current state of play, as well as a framework for data risk analysis and decision-making that can be used by the Frameworks in future.

Key recommendations include mitigations strategies for risks (reliability, longevity, timeliness and effort, credibility, and compliance), staying on top of progress and development in the environmental sustainability space, adopting common standards and improvements in investment and utilisation of supply-chain integrated data.

Executive summary

Background

The Australian Beef Sustainability Framework (ABSF), first released in 2017, and the Sheep Sustainability Framework (SSF), released in 2021, (collectively referred to as the Frameworks) are designed to account for issues of importance to stakeholders within and external to the Australian beef and sheep industries. In doing so the Frameworks aim to reduce risk and leverage opportunities for the beef and sheep industry.

The Frameworks, both supported by Meat and Livestock Australia (MLA), seek to measure and promote sustainability across the value chain. The effectiveness of the Frameworks relies on their ability to report on its indicators reliably and accurately and are therefore dependent on the quality of its data sources and the management of data risk.

Objectives

The project's objective was to provide MLA with a clear picture of both its current data risk, posed by the current data sources, and of the short- and long-term potential of the broader data landscape.

Methodology

The project was focused on two main tasks, a data audit of the current data sources based on a desktop audit, and a stocktake based on consultations and additional desktop research.

Results/key findings

The project identified the sources of risk in the current data suite, using an agreed framework. Based upon this, a data stocktake was undertaken to identify alternative and additional data sources for the short and long term.

Benefits to industry

Its findings can be used by MLA to benefit the industry by improving the efficiency and effectiveness of the Frameworks, in the short and long-term, and by informing decisions and planning to account for data risk, use additional data sources, and consider adjustment of indicators.

Future research and recommendations

There are 7 recommendations for this project:

1. Mitigating reliability risk in the short term by corroborating between multiple sources.
2. Mitigating longevity risk by collecting important indicator data
3. Mitigating timeliness and effort risk by slowing reporting cadence to match key data sources
4. Mitigating credibility and compliance risk by publishing methodologies and findings and having them accredited and audited where possible.
5. Staying on top of developments in the environmental sustainability landscape.
6. Adopting common standards for metadata and reporting as they become available
7. Facilitating the investment and utilisation of supply-chain integrated data.

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1. Background

1.1 About the Frameworks

The Australian Beef Sustainability Framework (ABSF), first released in 2017, and the Sheep Sustainability Framework (SSF), released in 2021 (collectively referred to as the Frameworks), are designed to guide the Australian beef and sheep industry toward more sustainable practices. The Frameworks, both managed by Meat and Livestock Australia (MLA), seek to measure and promote sustainability across the value chain. This is done across four themes: animal health and welfare, natural environment and climate, people, and community, and economic and financial. Within each theme, the Frameworks set priority issues and indicators for measurement. The ABSF monitors performance against 24 priority issues and 53 indicators, and the SSF against 21 priority issues and 59 indicators.

The Frameworks are useful for a variety of industry needs: identification of emerging issues, improved understanding of impacts which allows for corrective action, encouraging continuous improvement, increased accountability, and communication of progress. In doing so, the Frameworks serve the diverse needs of its stakeholders across the supply chain (producers, feed lotters, processors, live exporters), consumers and retailers, and policymakers.

1.2 The data challenge

The effectiveness of the Frameworks relies on their ability to report on their indicators reliably and accurately and are therefore dependent on the quality of their data sources and the management of data risk. The management of the Frameworks by MLA requires balancing the need for robust, relevant, reliable, and useful data against the cost of access or collection. It also requires managing the risks posed by each data source's organisation, methodology, and method of access. This task is made complex by the fact that the diversity of the data themes and indicators requires a multitude of data sources from different organisations, with differing methodologies and levels of transparency. Further, MLA must track an ever-evolving data landscape of new and emerging sources, changes in methodology, and changes in availability, cost, credibility, and granularity.

1.3 Questions

MLA, therefore, is faced with two questions:

- "What are the current data risks posed by the current set of sources, and how can they be accounted for?" and,
- "What potential is there in the data landscape, and how can it be best capitalised upon?"

This report addresses these questions through stocktake and assessment of the metric and data for the ABSF and SSF. It aims to equip MLA with a clear picture of both data risks, posed by the current set of sources, and of the short- and long-term potential of the broader data landscape to mitigate them. The findings can be used by MLA to improve the efficiency and effectiveness of the Frameworks, in the short and long-term, by informing decisions and planning to account for data risk, use additional data sources, and adjust indicators.

2. Objectives

The project sought to achieve the following objectives:

1. Identify the data risks posed by the current set of data sources.
2. Identify short- and long-term potential in the data landscape of new and emerging sources, changes in methodology, and changes in availability, cost, credibility, and granularity.
3. Provide recommendations for managing data risk and for capitalising on the potential in the data landscape.

The project was successful in achieving these objectives, with recommendations to support the data integrity of the Frameworks in the short and long term.

3. Methodology

This project was conducted in two phases, a data audit to identify data risks in the current sources, and a data stocktake to understand the data landscape.

3.1 Data audit

The data audit sought to identify the data risks in the current sources of the ABSF and the SSF. This involved defining the data assessment framework, completing the audit, and consolidating the findings.

The data assessment criteria were first based on best practice examples, such as the CSIRO Data Assessment Framework, and adapted through ACIL Allen's previous expertise in the space and in consultation with MLA project team. The result, outlined in table 3.1, was a refined and efficient framework that assessed the important data risks to the ABSF and SSF and also provided a data assessment tool that can be used for future data sources.

Table 3.1 Data assessment criteria

Credibility – whether the organisation is viewed as independent and trustworthy (E.g. for the purposes of greenwashing risk)
Bias – the extent to which the data is representative of its corresponding population.
Reliability – the extent to which the data is reported in a consistent manner (and is expected to do so in the future)
Timeliness – how frequently the data is reported.
Effort – whether processing the data to a useful format is costly.
Compliance – whether the data source complies with methodological or reporting standards, e.g. verification by a third-party organisation.
Longevity – the length of time that a dataset has been reported.

Source: ACIL Allen

Each data source was then assessed against each the assessment criteria with a rating of low, medium, or high risk. The thresholds for these ratings are outlined in Appendix 9.1.1.

3.2 Data stocktake

The data stocktake sought to identify short- and long-term potential in the data landscape of new and emerging sources, changes in methodology, and changes in availability, cost, credibility, and granularity. This was comprised of a broad stakeholder consultation that directed a desktop assessment.

The stakeholder engagement consisted of a set of one-on-one and small group interviews with industry subject matter experts, external subject matter experts and stakeholders across the supply chain.

Table 3.2 Stakeholders consulted for data stocktake

Stakeholder group	Stakeholder name
Government	Australian Bureau of Agricultural and Resource Economics (ABARES)
	Department of Agriculture, Fisheries and Forestry (DAFF)
	Commonwealth Scientific and Industrial Research Organisation (CSIRO)
Industry	Australian Wool Innovation (AWI)
	Integrity Systems Corporation (ISC)
	Australian Meat Processor Corporation (AMPC)
	Zero Net Emissions Agriculture Cooperative Research Centre (ZNE-Ag CRC)
	AUS-MEAT
	Animal Health Australia (AHA)
Private companies	AgriWebb
	Blackbox Co.
	Accounting for Nature

The consultations focused on the following discussion questions:

1. Looking at the existing Framework priorities, is there data you are aware of that are not currently being utilised by industry for sustainability reporting?
2. Where are the opportunities to improve data sources?
    a. Using other current data sources to augment or replace?
    b. Enhancing existing data sources' quality?
    c. Developing new data sources and techniques to augment or replace?
3. How will they improve data sources in terms of credibility, reliability, timeliness, effort, compliance or longevity?
4. Does your organisation intend to make any changes to the data used by the Frameworks (if applicable)?
    a. What are the implications for the Frameworks in the future?
    b. What are the strengths and weaknesses of the data sources you are involved/interested in?
5. What are the key trends the Frameworks need to consider in strengthening their data architecture?

The findings of the stakeholder consultation, specifically concerning new and emerging sources, changes in methodology, and changes in availability, cost, credibility, and granularity were investigated further by the desktop assessment.

4. Results

4.1 Data audit findings

4.1.1 Aggregated risk

The data audit found that the Frameworks relied on 40 data sources, 12 of which were shared, 15 of which were unique to the SSF and 12 unique to the ABSF. The data assessment found that the risk profile of the Frameworks was similar, as outlined in Table 4.1, and that only a small proportion are high risk.

Table 4.1 Data risk assessment of data sources by framework

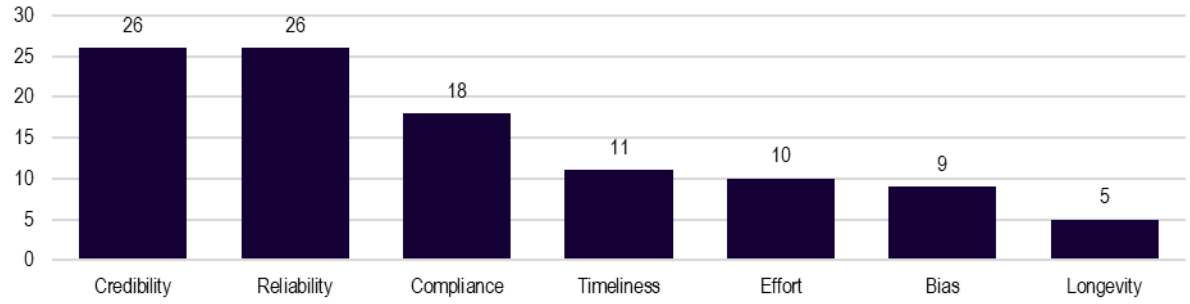
	Both (40 sources)	ABSF (27 sources)	SSF (25 sources)
High risk	5% (2)	8% (2)	7% (2)
Medium risk	53% (21)	52% (13)	52% (14)
Low risk	43% (17)	40% (10)	41% (11)

Note: For a more extensive and detailed summary, as well as an explanation of the data risk rating methodology, see Appendix 4.1.2

4.1.2 Aggregated risk by criteria

After aggregating the data source risk by criteria, both credibility and compliance were noted alongside reliability as aggregate issues.

Figure 4.1 Data risk score by assessment criteria



Note: For a more extensive and detailed summary, as well as an explanation of the data risk rating methodology, see Appendix 4.1.2

4.1.3 Risk by data source

It was identified that a sizeable minority (38%) of the highest risk data sources, outlined in Table 4.3, were shared between both Frameworks. As a result, the risk of these data sources extends to a larger proportion of the indicators.

Table 4.3 Data risk score by data source (medium and high risk)

Data source	Overall risk rating (score)	Total indicators	ABSF	SSF
AMPC - Environmental Performance Review 2022	High risk (9)	7	●	●
E.SSF.0001-National Producer Survey	High risk (8)	23	●	●
E.SUB.00010 - Beef Industry trends analysis - 2020	Medium risk (7)	2	●	
E.SUS.0006 - Pathways to low emissions in the Australian sheep industry	Medium risk (7)	2		●
ALFA shade survey	Medium risk (7)	1	●	
E.SUB.0007 - Cibo Labs	Medium risk (6)	6	●	●
MLA Red Meat Market Access Indicators	Medium risk (5)	4	●	●
MLA Community sentiment research 2024	Medium risk (5)	2		●
Australian Livestock Processing Industry Animal Welfare Certification System (AAWCS)	Medium risk (4)	2	●	●
ABS Value of production reporting	Medium risk (4)	2		●
MLA State of the Industry Report 2023	Medium risk (3)	2	●	
National Feedlot Accreditation Scheme (NFAS) reporting	Medium risk (3)	2	●	
AWI Global Brand Tracking Survey	Medium risk (3)	2		●
AWI Reporting	Medium risk (3)	2		●
ARCBA Polling data	Medium risk (3)	1	●	
Peak industry training (MLA, LiveCorp, AMPC)	Medium risk (3)	1	●	
Regional Wellbeing Survey	Medium risk (2)	3	●	●
ABS Census	Medium risk (2)	9	●	●
Livestock Production Assurance (LPA)	Medium risk (2)	3	●	●
National Wool Declaration Status (NWD)	Medium risk (2)	2		●

Note: For a more extensive and detailed summary, as well as an explanation of the data risk rating methodology, see Appendix 4.1.2

4.1.4 Aggregated risk by indicator and theme

The data risk implications for the indicators can also be assessed by having each indicator assume the risk rating of its data source and then aggregating the results. For both the ABSF and SSF, the environmental stewardship themethemehad the highest proportion of high and medium risk indicators (~82%). This was closely followed by animal welfare (~78%), in which the SSF had a higher proportion in high risk than the ABSF. Both had similar lower risk profiles in the people & community, and economic/financial resilience themes.

Table 4.4. ABSF: Indicator risk level by theme

Category	Environmental Stewardship	Animal Welfare	People & Community	Economic Resilience
Low risk	22% (4)	17% (2)	41% (7)	50% (3)
Medium risk	39% (7)	50% (6)	59% (10)	50% (3)
High risk	39% (7)	33% (4)	0%	0%

Note: This expresses the proportion of indicators within each theme that have a certain risk level. i.e. Low risk 22% means that 22% of indicators within that theme are low risk.

Table 4.5 SSF: Indicator risk level by theme

Category	Enhancing the environment	Caring for our sheep	People and community	Financial resilience
Low risk	17% (2)	28% (5)	19% (3)	38% (5)
Medium risk	25% (3)	22% (4)	63% (10)	62% (8)
High risk	58% (7)	50% (9)	19% (3)	0%

4.2 Data stocktake findings

4.2.1 New and extended data sources

A set of potential new (or extended) data sources were identified and assessed, covering all themes.

- **CSIRO Habit Condition Assessment System** - National biodiversity habitat condition assessment and reporting capability based on remote and spatial data as well as on ground condition assessments. It can be utilised for forest and woodland cover indicators.
- **AgriWebb** - Livestock management software, owned by a private company, that collects animals' (both cattle and sheep) data through electronic identification. They also collect information concerning production efficiency, which is related to genetic gain, and integrate with rain gauges, trough monitors, financial integrations, as well as FlintPro which covers vegetation and carbon sequestration. This makes it a suitable source for a variety of indicators.
- **Blackbox Co.** - Livestock management software, owned by a private company, who collects animals' (primarily cattle) production and supply chain data through electronic identification. The data that is collected is focused on individual animal production and supply chain data, this includes genetics, weight, induction, paddock, sale, pregnancy, wet, dry, and health. This will be better suited to productivity than health; feedlot health is well recorded, but pasture is less detailed. Though its data can be used for both economic and health indicators.
- **Accounting for Nature** - A model and set of standards for environmental sustainability measurement and tracking developed by Wentworth Group. As a broad based set of standards connected to a model for evaluation, it may be utilised for a variety of environmental indicators, though given the limited uptake and access it is yet unclear for which indicators it will be suited for. As a private company, a contract would need to be organised between MLA and Accounting for Nature.
- **Zero Net Emissions Agriculture Cooperative Research Centre (ZNE-Ag CRC)-** The Cooperative Research Centre (CRC) has a wealth of data available concerning emissions

factors and outcomes based on its demo sites. At its early stage of development its methodology is not yet assessable, and so a risk assessment was not completed. In future, should it become the emissions data exchange it aims to be it could be utilised for emissions indicators.

- **Livestock Production Assurance (LPA) and AUSMEAT** - The LPA has been extending its data collection to capture additional animal welfare data and plans to add environmental data collection in the future. Data declarations are built into supply chain assurance and actions, such as 'fit to load' and enforced by high quality audits by AUSMEAT.
- **Australian Meat Processor Corporation (AMPC) Data Portal** - Soon to be released by AMPC, its processors data portal will report on environmental and HR information, as well as workforce and economic data such as throughput, labour efficiency, line speed, and output.

A data risk assessment of each potential new source is available in Appendix 8.2.1.

4.2.2 Changes in methodology

Of the data sources being used by the Frameworks, the changes in methodology were comprised of the cessation of surveys.

- **Animal Health Australia Survey** - Animal Health Australia is reliant on survey methods including the MLA Producer Survey for their findings, however cost has become prohibitive. Their recurring survey with Plant Health Australia has been ceased due to a lack of perceived value add.
- **Australian Wool Innovation (AWI) Global brand Tracking Survey** - The survey is proving too high cost given budgetary constraints to complete year-to-year, and so the survey will likely cease this frequency in future. In the long term, AWI envision data embedded in transactions in the supply chain rather than a dependence on surveys.

4.2.3 Future directions

Much of the future directions reflected the in-flux state of environmental reporting standards, and of a move toward data consistency.

- **CSIRO Australian Agricultural Sustainability Framework (AASF) Data Assessment Framework** - As part of the work toward the AASF, the CSIRO has developed a set of data assessment and definition standards to improve usage of common datasets.
- **ABS National Ecosystem Accounts** - The ABS has released its first experimental national ecosystem accounts. These estimate the extent, condition, and services provided by Australia's ecosystems, including terrestrial, freshwater, and marine realms.
- **ABARES Agri-environmental indicators assessment** - This research assessed environmental indicators appropriateness, outlining issues concerning the usage and interpretation of emissions and production indicators.
- **Taskforce on Nature-related Financial Disclosures**. Landscape assessment of nature related risk, data coverage, and key gaps.

Leading Harvest - Manages a set of universally applicable sustainability standards including the 'Leading Harvest Farmland Management Standard – Pasture and Livestock'. It addresses economic, environmental, social and governance issues.

5. Key findings

5.1 Risk drivers

The data audit and stocktake found that the risk of the data sources can be attributed to a common set of risk drivers. First, it is understood that the majority data risk comes from data source instability; this can come from either the instability of indicators, changing the requirements, or from instability of methodology, due to business pressures or unreliability in underlying methods, such as self-reporting bias. This drives reliability, timeliness, effort, and longevity risk. The remainder of data risk is comprised of those driven by perception, where the indicators are used to communicate to markets and consumers which may have particular judgements or standards of the data sources. This drives credibility and compliance risk.

The risk that has been identified through the data audit and stocktake can be divided into these drivers. The risk in environmental data sources is largely driven by indicator instability, the other sector themes due to methodology instability, largely concerning surveys, and general credibility and compliance risk is driven by data source perception.

Table 5.1 – Risk drivers

Driver	Consequence
Indicator instability	Environmental data source instability - Uncertainty of future reporting requirements and corresponding methodology - Lack of incentive to invest in measurement - Lack of available data sources - Lack of complete data sources
Methodology instability	Survey data source instability: - Reduced accuracy - Increased costs - Decreased frequency of reporting, or complete cessation
Perception	- Reliance on industry reported data creates additional scrutiny for compliance and auditing

5.1.1 Indicator instability and environmental data source risk

The indicators for environmental sustainability remain in flux, creating risk for the environmental indicators and data sources. There are several different standards being developed and adopted, and the requirements for accessing different markets are yet to be settled for the long term. Reflecting this, environmental data sources are not readily available, and the sustainability Frameworks are therefore dependent on a set of static reports. As methodologies of collection and measurement lack maturity and stability, reporting is inconsistent and future requirements and changes are uncertain.

This instability appears in the risk ratings of the key environmental data sources. The three sources outlined in Table 5.2are utilised for 20 of the 30 environmental indicators across both Frameworks. Their high-risk rating reflects the indicator instability noted above, in that they are largely static reports with changeable methodologies, with limited timeliness and longevity, with some cost to collect and collate by MLA.

Table 5.2 – Environmental

Data source	Overall risk	Reliability	Timeliness	Effort	Longevity
AMPC - Environmental Performance Review 2022	**High risk (9)**	High risk	High risk	Medium risk	Medium risk
E.SSF.0001-National Producer Survey	**High risk (8)**	Medium risk	Medium risk	High risk	Medium risk
E.SUB.0007 - Cibo Labs	**Medium risk (6)**	High risk	Medium risk	Medium risk	Low risk

5.1.2 Data source instability and sector themes risk

Risk in the sector themes, concerning animal welfare and economic and social sustainability, is driven by methodology instability. Survey data sources are decreasing in accuracy and increasing in cost as response rates decrease, leading to the slowing or cessation of multiple sources. Both Animal Health Australia and Australian Wool innovation noted in consultation that the cost of surveys was proving to be a barrier, and that they were planning to slow or cease their survey collection. Additionally, the ABS has undertaken significant changes to their methodology to reduce reliance on survey data based as part of the Modernising Agricultural Statistics Project.[1] This creates uncertainty concerning the methodologies of survey sources: in terms of their scope of questioning, breadth of distribution, and reporting.

The risk ratings of the survey data sources reflect this methodological instability. The high reliability risk, as outlined in Table 5.3 reflects the abovementioned methodology changes, which have ramifications for the timeliness, effort, and longevity risks of these sources.

Table 5.3 - Survey data risk

Data source	Overall risk	Reliability	Timeliness	Effort	Longevity
E.SSF.0001-National Producer Survey	**High risk (8)**	Medium risk	Medium risk	High risk	Medium risk
ALFA shade survey	**Medium risk (7)**	High risk	Low risk	Low risk	High risk
MLA Community sentiment research 2024	**Medium risk (5)**	Low risk	Low risk	High risk	Low risk
ABS Value of production reporting	**Medium risk (4)**	High risk	High risk	Low risk	Low risk
ABARES Commodity price reporting	**Medium risk (4)**	High risk	High risk	Low risk	Low risk
AWI Global Brand Tracking Survey	**Medium risk (3)**	Medium risk	Low risk	Low risk	Low risk
AWI Reporting	**Medium risk (3)**	Medium risk	Low risk	Low risk	Low risk

This risk posed by survey data source instability is compounded by the current dependence on them. As current supply chain data collection does not encapsulate all aspects of sustainability needed for the Frameworks, almost half of the data sources and indicators are reliant on survey data sources[2].

[1] Australian Bureau of Statistics, (2024), Modernising agricultural statistics: Update on achievements and remaining data gaps, https://www.abs.gov.au/statistics/detailed-methodology-information/information-papers/modernising-agricultural-statistics-update-achievements-and-remaining-data-gaps, accessed 12 March 2025.

[2] 42% of data sources and 52% of indicators, further detail available in Appendix 8.3.2.

These sources are especially relied upon for Animal welfare indicators, 47% across both indicators, and approximately 20% of indicators for the remaining themes. There is additional dependence on the MLA National Producer Survey, with almost 20% of indicators reliant on that source alone; and, with the cessation of other survey sources this dependence may increase in the short term.

5.1.3 Perception and credibility and compliance risk

The remainder of the risk identified in the data sources is largely driven by perception and the subsequent risk for credibility and compliance. Many of the non-survey sources, though more reliable in their methodology, are largely reported by industry sources. This creates additional scrutiny on the compliance of their methodologies, and expectations for their auditing and corroboration.

These sources of instability and compounding factors are driving the risk emerging in the data sources. Collectively, these risks can be consolidated into a set of 6 as outlined in Table 5.4.

Table 5.4 – Credibility and compliance risk

Data source	Overall risk rating	Credibility assessment	Compliance rating
MLA Red Meat Market Access Indicators	**Medium risk (5)**	Medium risk	Medium risk
Australian Livestock Processing Industry Animal Welfare Certification System (AAWCS)	**Medium risk (4)**	High risk	Medium risk
National Feedlot Accreditation Scheme (NFAS) reporting	**Medium risk (3)**	High risk	Medium risk
ARCBA Polling data	**Medium risk (3)**	High risk	Medium risk
MLA State of the Industry Report 2023	**Medium risk (3)**	Medium risk	Medium risk
Peak industry training (MLA, LiveCorp, AMPC)	**Medium risk (3)**	High risk	Medium risk
Livestock Production Assurance (LPA)	**Medium risk (2)**	Medium risk	Medium risk
NSQA sale-yard registration data	**Medium risk (2)**	Medium risk	Medium risk

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5.2 Risk assessment

The collective risk of the data sources outlined above, which account for ~90% of data source risk for the Frameworks (See appendix 8.3.3), can be summarised as in a risk assessment matrix. The matrix in Table 5.5 consolidates the data risk of the Frameworks' sources under the criteria used for the data audit, reliability, timeliness, effort, longevity, credibility, and compliance, and links them to mitigation strategies based on the driver(s) of that risk.

Table 5.5 – Risk assessment matrix

Driver	Risk(s)	Description	Likelihood	Consequence	Mitigation(s)
Indicator and/or methodology (data source) instability	**Reliability** – inconsistent reporting	Survey data sources lack statistical reliability.	High	Medium	Corroborate across multiple data sources. Make use of supply chain integrated data. Encourage common standards.
		Lack of comprehensive datasets.	High	Low	
		Inconsistently reported data due to changing methodologies.	High	Medium	
	Longevity – non-enduring data	Infrequent or one-off data reporting, or significant methodology changes, preventing trend analysis.	High	Low	Conduct own data collection where needed.
	Timeliness – reporting is slowed or irregular **Effort** – increased costs of collation	Slowed or irregular data reporting cadence, limiting ability to present latest information for all indicators.	Medium	Low	Slow framework reporting cadence.
Perception	**Credibility** – reliance on industry-reported data. **Compliance** – lack of accreditation or auditing of industry-reported data.	Additional scrutiny on the compliance of industry data reporting methodologies and increased expectations for auditing.	High	Medium	Publish methodologies and have them audited and accredited. Audit data findings and publish results.

5.3 Mitigation strategies

As outlined in the risk assessment matrix, the data risks can be mitigated by a shared set of strategies that can account for multiple risks.

5.3.1 Reliability risk strategies

In the short term, environmental data sources will remain partial and limited due to instability in the space. MLA can utilise some additional sources and corroborate between them to get a more complete picture, and to make findings more robust to changes in methodology and samples. Some options for this are presented in Table 5.6.

Table 5.6 – Short term additions to environmental data sources

Data source	Potential value
CSIRO Habit Condition Assessment System	This is a public source that is readily available, and so the data could be used to corroborate or replace data used for forest and woodland cover indicators.
AgriWebb	This is a private source, using electronic identification (eID) that would require a contract to access. As the data source covers a sufficient sample currently, 25% of producers, the data could be used to corroborate or replace data used for emissions, farm vegetation and water usage indicators for both Frameworks.
Blackbox Co.	This is a private source, utilising eID, that would require a contract to access. As the data source covers a sufficient sample currently, 315 beef producers (only fledgling numbers of sheep producers), the data could be used to corroborate or replace data used for emissions and water usage indicators for the ABSF. In the long term this could also be a source for the SSF.

Note: To see a description of these sources see Section 4.2. and for further detail see Appendix 9.2.

Similarly, the lack of survey data reliability and statistical accuracy can be compensated for by corroborating between multiple sources. To this end the LPA and AMPC Data Portal present good options, as outlined in Section 4.2. These data sources present good alternatives as they collect data through their assurance function and are enforced by audits. This means they have high data integrity and do not incur additional costs to serve the sustainability Frameworks. Additionally, some private company data sources can be used as supplements, such as Blackbox Co. and AgriWebb, described in Sections 4.2 and Appendix 9.2; these collect production, economic, environmental and animal welfare data with sufficient sample sizes.

In the long term, MLA has limited control over the stability of the environmental indicators. It will need to remain abreast of changes and requirements. As outlined in Section 4.2, there are multiple references MLA can draw upon for the implementation of new indicators:

- ABARES – Agri-environmental indicators assessment
- Accounting for Nature
- Zero Net Emissions Agriculture Cooperative Research Centre (ZNE-Ag CRC)
- Taskforce on Nature-related Financial Disclosures
- Leading Harvest

For sector data sources, supply-chain integrated data sources and consistent data standards represent the future. The ability of supply chain integrated data sources, such as the LPA and AMPC Data Portal, to integrate the cost of data collection into business-as-usual certification, and their validity based on their auditing function, make them ideal future data sources. This will create a high integrity data source that will likely be able to replace many of the current survey data sources. MLA will need to work with these sources, and those similar in the supply chain, to create a unified future vision and encourage working in the same direction. An option could be encouraging adoption of common standards such as the CSIRO Australian Agricultural Sustainability Framework (AASF) Data Assessment Framework.

Though, there will be a residual risk that data standards may change and until they are settled there will be limited investment in centralised and stable data sources. Additionally, while waiting for supply chain integrated data, surveys will always be limited in their accuracy and corroborating data sources may be limited based on available data and costly to access and facilitate.

5.3.2 Longevity risk strategies

Due to the reliability risks driven by instability noted above, there is also likely to be longevity risk for multiple indicators. As methodologies change there is going to be a lack of enduring data sources, making trend analysis difficult. MLA can compensate for this somewhat by collecting additional data when other organisations and data sources prove too unstable. However, there will be residual risk due to indicator and data source instability as noted above.

5.3.3 Timeliness and effort strategies

As other organisations respond to the reliability risks and instability, there are likely to be ramifications for timeliness and effort risks. Multiple organisations reported plans to change or slow their reporting cadences. This will make up-to-date reporting on indicators at the current reporting cadence of the Frameworks difficult and potentially incurring extra cost to consolidate. This can be somewhat mitigated by slowing the reporting cadence of the Frameworks to match that of key data sources.

5.3.4 Credibility and compliance risk strategies

As the Frameworks become more dependent on industry surveys and later its supply-chain-integrated data, there will be additional scrutiny on their integrity. To maximise the credibility of these sources, methodologies should be published and accredited as much as possible. Additionally, where possible survey and self-reporting instrument findings should be audited by inspection.

6. Benefits to industry

The findings and recommendations of this report benefit the red meat industry in the following ways:

- Understanding of current data risk facilitates mitigation before issues arise.
- Understanding of the data landscape and long-term direction allows the industry to align on future data sources and indicator developments.
- Informing data investment and decision-making to direct the industry's resources more efficiently for maximum benefit to the Frameworks in the short and long term.
- Mitigating data risk in the short and long term improves the integrity and efficiency of the Frameworks over time; ensuring that the red meat industry continues to meet the needs of Australian and international consumers and markets.

7. Future research and recommendations

There are seven recommendations from this project. Each are detailed below.

Recommendation 1 – Mitigating reliability risk in the short term by using multiple sources to validate findings

Mitigating short term risks will help to account for partial and nascent datasets. This is particularly relevant in the case of environmental data. This will also assist by compensating for unreliability and cost issues with survey sources. It requires consideration of the cost of accessing additional data sources, and the ability to corroborate their findings. Additional sources should be identified and assessed over time as they emerge.

Recommendation 2 – Mitigating longevity risk by collecting important indicator data

If MLA collects data where the methodology of another organisation is unstable, it reduces the risk on important indicators. This requires an assessment of the importance of indicators and the level of reliability and longevity risk of the data source they are reliant upon. It will also require an assessment of the cost to MLA of collecting this additional data.

Recommendation 3 – Mitigating timeliness and effort risk by slowing reporting cadence to match key data sources

This will reduce the effort and repetitiveness of reporting where no new data is available. This requires an assessment of whether slowing reporting cadences of some data sources affects important indicators, and the overall effects of slowing the frequency of the overall framework reporting.

Recommendation 4 – Mitigating credibility and compliance risk by publishing methodologies and findings and having them accredited and audited where possible.

This will mitigate the risk of reliance on industry reported data. This is especially important as the system shifts to supply-chain integrated data.

Recommendation 5 – Staying on top of developments in the environmental sustainability landscape.

Much of the instability of environmental indicators is out of the red meat industry's control, it is important for MLA to understand the developments in the environmental space to anticipate where issues may arise.

Recommendation 6 – Adopting common standards for metadata and reporting as they become available

Adoption of metadata standards, such as the CSIRO Australian Agricultural Sustainability Framework (AASF) Data Assessment Framework, will reduce data sharing costs in the long run and maximise the utility of data sources. Additionally, as standards for data reporting emerge, such as the use of 10-year rolling averages for productivity reporting, and the use of climate-adjusted rates, they should be adopted.

Recommendation 7 – Facilitating the investment and utilisation of supply-chain integrated data.

As supply-chain integrated data becomes more extensive and embedded they will start to replace other sources. It is important that there is continued investment to ensure high-integrity sources, including accreditation and auditing, and that data important to the Frameworks is integrated over time.

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9. Appendix

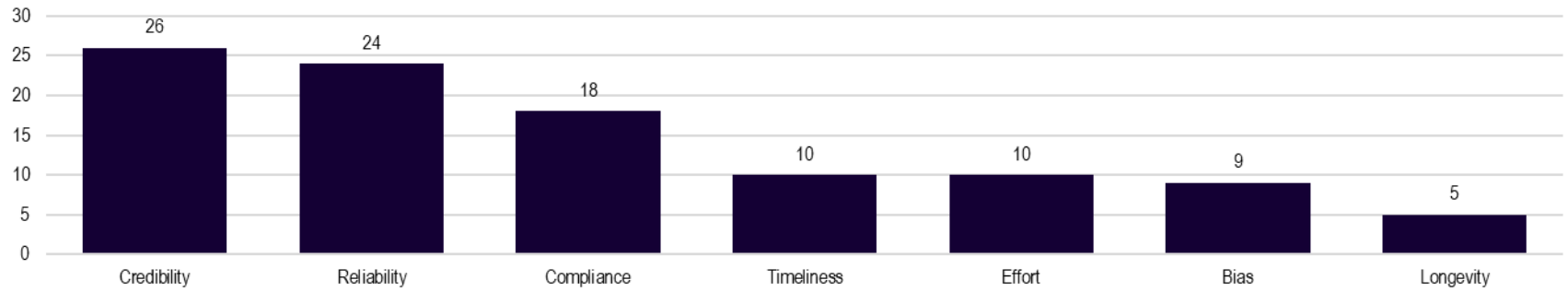
9.1 Data audit

9.1.1 Data assessment criteria

Credibility – whether the organisation is viewed as independent and trustworthy (E.g. for the purposes of greenwashing risk)	
Low risk	The organisation is an independent government (or government funded) organisation.
Medium risk	The organisation is an independent non-government organisation.
High risk	The organisation is a peak body or represents industry interests.
Bias – the extent to which the data is representative of its corresponding population.	
Low risk	The data is highly representative through a large random sample, and high-quality data collection methodology.
Medium risk	The data is somewhat representative through a smaller random sample or larger biased sample, with a clear data collection methodology.
High risk	The data is not highly representative through an insignificant sample with purposive or self-selected sampling, and/or an unclear data collection methodology.
Reliability – the extent to which the data is reported in a consistent manner (and is expected to do so in the future)	
Low risk	The data is consistently and reliably reported without breaks or significant changes.
Medium risk	The data is somewhat consistently and reliably reported with minor breaks or changes.
High risk	The data has frequent breaks and/or large changes in methodology.
Timeliness – how frequently the data is reported.	
Low risk	The data is reported highly frequently, at least once per year.
Medium risk	The data is reported infrequently, less than once per year.
High risk	The data is reported at a point in time in a static report, only reported at the time without regular repetition.
Effort – whether processing the data to a useful format is costly.	
Low risk	The data is delivered in a format that requires minimal processing.

Medium risk	The data requires some effort to process.
High risk	The data requires significant time or cost to process.
Compliance – whether the data source complies with methodological or reporting standards, e.g. verification by a third-party organisation.	
Low risk	The data source has been verified to comply with methodological and reporting standards.
Medium risk	The data source claims, but has not been verified, to comply with methodological or reporting standards.
High risk	The data source does not claim to comply with any methodological or reporting standards.
Longevity – the length of time that a dataset has been reported.	
Low risk	The data has been consistently reported for more than 5 years.
Medium risk	The data has been reported for less than 5 years and more than 2 years.
High risk	The data has been reported for 2 years or less.

9.1.2 Summary by risk type



Note: The total score is calculated as the sum of all assessment criteria, weighing each equally, where the risk ratings are assigned a score (low = 0, medium = 1, high = 2).

9.1.3 Overall summary

Data source	Overall	Credibility	Bias	Reliability	Timeliness	Effort	Compliance	Longevity
E.SSF.0001-National Producer Survey	High risk (8)	Medium risk	Medium risk	Medium risk	Medium risk	High risk	Medium risk	Medium risk
AMPC - Environmental Performance Review 2022	Medium risk (7)	Medium risk	Medium risk	Medium risk	Medium risk	Medium risk	Medium risk	Medium risk
E.SUS.0006 - Life Cycle Assessment of the Australian sheep industry / Pathways to low emissions in the Australian sheep industry	Medium risk (7)	Medium risk	Low risk	High risk	High risk	Medium risk	Medium risk	Low risk
ALFA shade survey	Medium risk (7)	High risk	Low risk	High risk	Low risk	Low risk	Medium risk	High risk
E.SUB.0007 - Cibo Labs	Medium risk (6)	Medium risk	Low risk	High risk	Medium risk	Medium risk	Medium risk	Low risk
E.SUB.00010 - Beef Industry trends analysis - 2020	Medium risk (5)	Medium risk	Low risk	Medium risk	High risk	Medium risk	Medium risk	Low risk
MLA Red Meat Market Access Indicators	Medium risk (5)	Medium risk	Low risk	Medium risk	Low risk	Medium risk	Medium risk	Medium risk
MLA Community sentiment research 2024	Medium risk (5)	Medium risk	Medium risk	Low risk	Low risk	High risk	Medium risk	Low risk
Australian Livestock Processing Industry Animal Welfare Certification System (AAWCS)	Medium risk (4)	High risk	Low risk	Medium risk	Low risk	Low risk	Medium risk	Low risk

ABS Value of production reporting	Medium risk (4)	Low risk	Low risk	High risk	High risk	Low risk	Low risk	Low risk
MLA State of the Industry Report 2023	Medium risk (3)	Medium risk	Low risk	Low risk	Low risk	Medium risk	Medium risk	Low risk
National Feedlot Accreditation Scheme (NFAS) reporting	Medium risk (3)	High risk	Low risk	Low risk	Low risk	Low risk	Medium risk	Low risk
AWI Global Brand Tracking Survey	Medium risk (3)	Medium risk	Medium risk	Medium risk	Low risk	Low risk	Low risk	Low risk
AWI Reporting	Medium risk (3)	Medium risk	Medium risk	Medium risk	Low risk	Low risk	Low risk	Low risk
ARCBA Polling data	Medium risk (3)	High risk	Low risk	Low risk	Low risk	Low risk	Medium risk	Low risk
Peak industry training (MLA, LiveCorp, AMPC)	Medium risk (3)	High risk	Low risk	Low risk	Low risk	Low risk	Medium risk	Low risk
Regional Wellbeing Survey	Medium risk (2)	Low risk	Medium risk	Low risk	Low risk	Low risk	Medium risk	Low risk
ABS Census	Medium risk (2)	Low risk	Low risk	Medium risk	Medium Risk	Low risk	Low risk	Low risk
Livestock Production Assurance (LPA)	Medium risk (2)	Medium risk	Low risk	Low risk	Low risk	Low risk	Medium risk	Low risk
National Wool Declaration Status (NWD)	Medium risk (2)	Medium risk	Low risk	Low risk	Low risk	Low risk	Medium risk	Low risk
Survey of R&D	Medium risk (2)	Low risk	Medium risk	Medium risk	Low risk	Low risk	Low risk	Low risk
NSQA sale-yard registration data	Medium risk (2)	Medium risk	Low risk	Low risk	Low risk	Low risk	Medium risk	Low risk
ABARES Commodity price reporting	Medium risk (2)	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk
B.CCH.2124 – Red meat greenhouse gas	Low risk (1)	Low risk	Low risk	Medium risk	Low risk	Low risk	Low risk	Low risk

emissions update 2021								
ABARES Productivity reporting	Low risk (1)	Low risk	Low risk	Medium risk	Low risk	Low risk	Low Risk	Low risk
Work-related Traumatic Injury Fatality Data	Low risk (1)	Low risk	Low risk	Low risk	Low risk	Low risk	Medium risk	Low risk
Lifetime Ewe Management (LTEM) training completion	Low risk (1)	Medium risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
MerinoSelect Australian Sheep Breeding Values reporting	Low risk (1)	Medium risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
ABARES Calculation on Australian Agricultural and Grazing Industries Survey (AAGIS).	Low risk (1)	Low risk	Low risk	Medium risk	Low risk	Low risk	Low risk	Low risk
International Merchandise Trade	Low risk (1)	Low risk	Low risk	Medium risk	Low risk	Low risk	Low risk	Low risk
Live sheep export mortality reporting	Low risk (1)	Low risk	Medium risk	Low risk	Low risk	Low risk	Low risk	Low risk
ABARES Financial performance reporting	Low risk (1)	Low risk	Low risk	Medium risk	Low risk	Low risk	Low risk	Low risk
Live cattle export mortality reporting	Low risk (1)	Low risk	Medium risk	Low risk	Low risk	Low risk	Low risk	Low risk
MSA Annual Outcomes Report	Low risk (1)	Medium risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
National Residue Survey	Low risk (0)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
National disease reporting	Low risk (0)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk

Fair Work Ombudsman Award Wage	Low risk (0)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Exporter Supply Chain Assurance System (ESCAS) consignments and non-compliance data	Low risk (0)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Fair Work Ombudsman Compliance Notices Reporting	Low risk (0)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Traineeships and apprenticeships enrolments and completions	Low risk (0)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk

Note: The overall risk rating is expressed as 'Rating (score)'. In which the overall risk score is calculated as the sum of all assessment criteria, weighing each equally, where the risk ratings are assigned a score (low = 0, medium = 1, high = 2). The overall rating is assessed using the thresholds of Low risk 0-2, Medium risk 3-8, High risk 8+.

9.1.4 Top 10 highest risk data sources

National Producer Survey – High risk (8)

Managed by MLA

Aspect	Assessment	Explanation
Credibility	Medium risk	Research and Development Corporation
Bias	Medium risk	Both the beef and sheep surveys have sizeable stratified and weighted samples, though there is still a risk of selection bias based on response to the survey.
Reliability	Medium risk	Survey design has changed in 2021 and 2023 for new metrics. “Post launch, more comprehensive surveys were conducted in 2021 and 2023/24 to track previous metrics and establish benchmarks for new ABSF/SSF metrics."
Timeliness	Medium risk	Surveys are completed infrequently, every 2-3 years.
Effort	High risk	Collection of this data requires completion and analysis of a survey by MLA.
Compliance	Medium risk	The methodology is clearly outlined, though it has not been externally verified.
Longevity	Medium risk	The more comprehensive surveys have been completed more than 2 years ago, but less than 5 years ago, in 2021.

Shared by 23 indicators across the ABSF and SSF.

AMPC - Environmental Performance Review 2022 – Medium risk (7)

Managed by Australian Meat Processor Corporation (AMPC).

Aspect	Assessment	Explanation
Credibility	Medium risk	Research and Development Corporation
Bias	Medium risk	The voluntary nature of participation, though mitigated with an incentive and 60% of red meat processing being represented, creates some risk of a selection bias.
Reliability	Medium risk	This report has had a small number of iterations and must continue to adapt to shifting environmental indicator requirements and standards.
Timeliness	Medium risk	To be reported biennially.
Effort	Medium risk	Data is reported at a high level. Though creation of the report requires synthesis of multiple data sources.
Compliance	Medium risk	The methodology is clearly outlined, though it has not been externally verified.
Longevity	Medium risk	There are a diverse set of data inputs into this set, all are available for 2 years or more and some for much longer.

Shared by 7 indicators across the ABSF and SSF.

E.SUS.0006 - Life Cycle Assessment of the Australian sheep industry / Pathways to low emissions in the Australian sheep industry – Medium risk (7)

Managed by Integrity Ag & Environment (Commissioned by MLA).

Aspect	Assessment	Explanation
Credibility	Medium risk	Independent non-government organisation.
Bias	Low risk	All data used is from highly reputable organisations and highly representative surveys - ABS, ABARES, Commonwealth of Australia.
Reliability	High risk	This is a single report developed for this purpose, and it is unclear if there will be future repetitions or changes to the methodology.
Timeliness	High risk	Static report.
Effort	Medium risk	Data is reported as an easy-to-use PowerBI dashboard. Though creation of the dashboard requires synthesis of multiple data sources.
Compliance	Medium risk	The methodology is clearly outlined and follows ISO and established methodologies, though it has not been externally verified.
Longevity	Low risk	The data has been consistently reported for more than 5 years, since 2019.

Shared by 2 indicators across the SSF.

ALFA shade survey- Medium risk (7)

Managed by Australian Lot Feeders Association (ALFA).

Aspect	Assessment	Explanation
Credibility	High risk	Peak body or represents industry interests
Bias	Low risk	The data is reported from scheme record data and so is representative.
Reliability	High risk	The data was collected for the first time in 2023, following announcement in 2022, and so the methodology is subject to change.
Timeliness	Low risk	Data is reported annually.
Effort	Low risk	Data is reported as a high-level summary.
Compliance	Medium risk	The methodology is clearly outlined, though it has not been externally verified.
Longevity	High risk	The data has been reported for less than 2 years, with the first data reporting in 2023.

Utilised by 1 indicator in the ABSF.

E.SUB.0007 - Cibo Labs - Medium risk (6)

Managed by CIBO Labs (Commissioned by MLA).

Aspect	Assessment	Explanation
Credibility	Medium risk	Independent non-government organisation
Bias	Low risk	Data sources utilise satellite data to encapsulate the country and so is representative.
Reliability	High risk	National data inputs regarding ground cover are secure and robust, forest cover data managed by Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) is less reliable.
Timeliness	Medium risk	Static report with a dashboard updated annually, though note 2-year lag.
Effort	Medium risk	Data is reported as an easy-to-use PowerBI dashboard. Though creation of the dashboard requires synthesis of multiple data sources.
Compliance	Medium risk	The methodology is clearly outlined, though it has not been externally verified.
Longevity	Low risk	Data has been consistently reported for more than 5 years, since 2019.

Shared by 6 indicators across the ABSF and SSF.

E.SUB.00010 - Beef Industry trends analysis – 2020 – Medium risk (5)

Managed by Integrity Ag & Environment (Commissioned by MLA).

Aspect	Assessment	Explanation
Credibility	Medium risk	Independent non-government organisation.
Bias	Low risk	All data utilised is from highly reputable organisations and highly representative surveys and record data - ALFA feedlot livestock numbers, ABS cattle processing, ABARES survey, and the Australian LCI database.
Reliability	Medium risk	This report has had a small number of iterations and must continue to adapt to shifting environmental indicator requirements and standards.
Timeliness	High risk	Static report.
Effort	Medium risk	Data is reported at a high level. Though creation of the dashboard requires synthesis of multiple data sources.
Compliance	Medium risk	The methodology is clearly outlined, though it has not been externally verified.
Longevity	Low risk	Data utilised allows reporting for more than 5 years, from 1985.

Shared by 2 indicators across the ABSF.

MLA Red Meat Market Access Indicators - Medium risk (5)

Managed by Meat and Livestock Australia (MLA).

Aspect	Assessment	Explanation
Credibility	Medium risk	Research and Development Corporation
Bias	Low risk	Data utilised is from highly representative record data (DAFF, DFAT, ABS, Global Trade Data)
Reliability	Medium risk	Data reporting structure changed to align with RM2030 + MLA SP + MLA AIP in 2024.
Timeliness	Low risk	Data is reported annually.
Effort	Medium risk	This data requires processing by MLA.
Compliance	Medium risk	The methodology is clearly outlined, though it has not been externally verified.
Longevity	Medium risk	Data for all indicators can be calculated for more than 2 years but less than 5 years ago, from 2021.

Shared by 4 indicators across the ABSF and SSF.

MLA Community sentiment research 2024 - Medium risk (5)

Managed by Meat and Livestock Australia (MLA).

Aspect	Assessment	Explanation
Credibility	Medium risk	
Bias	Medium risk	The data utilises a robust, representative sample of ~1500 main grocery buyers and main meal preppers aged 18-64, across the five main capital cities in Australia. Though there is still a risk of selection bias based on response to the survey, and with the focus on capital cities.
Reliability	Low risk	Data is consistently reported and unlikely to change in future
Timeliness	Low risk	Data is reported annually.
Effort	High risk	Collection of this data requires completion and analysis of a survey by MLA.
Compliance	Medium risk	The methodology is clearly outlined, though it has not been externally verified.
Longevity	Low risk	Data is able to be reported for more than 5 years, since 2010.

Shared by 2 indicators across the SSF.

Australian Livestock Processing Industry Animal Welfare Certification System (AAWCS) - Medium risk (4)

Managed by Australian Meat Industry Council (AMIC) and Meat and Livestock Australia (MLA).

Aspect	Assessment	Explanation
Credibility	High risk	Peak body or represents industry interests
Bias	Low risk	The data is reported from AAWCS participation record data and so is representative.
Reliability	Medium risk	The methodology for collection of slaughter data was changed in 2021.
Timeliness	Low risk	Data is reported annually.
Effort	Low risk	Data reporting requires processing by MLA and matching between slaughter data and accreditation data.
Compliance	Medium risk	The methodology is clearly outlined, though it has not been externally verified.
Longevity	Low risk	The data has been consistently reported for more than 5 years, since 2017.

Shared by 2 indicators across the ABSF and SSF.

ABS Value of production reporting - medium risk (4)

Managed by Australian Bureau of Statistics (ABS).

Aspect	Assessment	Explanation
Credibility	Low risk	Government organisation
Bias	Low risk	The ABS utilises a high-quality data collection methodology, utilising new sources and methods that include cattle held on smaller farms providing a more complete estimate of total cattle in Australia.
Reliability	High risk	This is the first report developed for updated agricultural statistics; it is unclear when the next release will be. Estimates are experimental because the ABS intends to further refine this approach utilising additional data sources
Timeliness	High risk	This is the first release of agricultural statistics produced using new methods and data sources, with annual reporting indicated but not confirmed.
Effort	Low risk	Data is easy to process
Compliance	Low risk	Data source is verified as being from a highly reputable national institution.
Longevity	Low risk	Data has been reported for a period for more than 5 years, from 1981.

Shared by 2 indicators across the SSF.

9.2 Data stocktake

9.2.1 Data risk assessment of new and emerging data sources

AgriWebb – Medium risk (6)

Livestock management software based on eID to manage detailed data concerning weight, cost of production, and grazing planning. Some data already provided to MLA, though additional data can be utilised to replace or corroborate the national producer survey concerning biosecurity, environmental, animal welfare, and economic indicators. AgriWebb has reported that they have been integrating with the MLA carbon calculator with prefill and benchmarking at the NRM level to provide baselines for comparison. They also collect information concerning production efficiency, which is related to genetic gain, and integrate with rain gauges, trough monitors, financial integrations, as well as FlintPro which covers vegetation and carbon sequestration.

Aspect	Assessment	Explanation
Credibility	High risk	AgriWebb is a private company.
Bias	Low risk	Likely biased toward more progressive and larger producers, 25% of all producers is a sufficiently large sample size for robust findings.
Reliability	Medium risk	As methods are not publicly published, it is unclear whether they are or are expected to be reported consistently.
Timeliness	Low risk	A national level spreadsheet can be made available nationally.
Effort	Medium risk	Data is likely reported in a summary fashion but would incur cost to access.
Compliance	High risk	AgriWebb's methods and data are private and proprietary.
Longevity	Unknown	Longevity of reporting is unclear.

AgriWebb reported that they would be able to assist with validating the following indicators:

ABSF:

- *1.1-Percentage of producers using appropriate pain relief for invasive husbandry practices*
- *1.2-Percentage of cattle receiving appropriate pain relief for invasive husbandry practices*
- *1.3-Percentage of polled calves born in seedstock herds*
- *2.1-Percentage of cattle properties covered by a documented biosecurity plan*
- *5.4-Vaccination rates for clostridial diseases*
- *10.1-Percentage total CO2e reduced by beef industry from a 2005 baseline*

- *10.2-Net emissions: Mt of CO2e emitted by the beef industry*
- *10.3-kg CO2e emitted per kg liveweight when raising beef*
- *10.6-Carbon sequestered in on- farm vegetation (MT C02e)*
- *11.1-Litres of water used per kg of liveweight for raising cattle*

SSF:

- *1.2.1a-Percentage of producers pregnancy scanning ewes for litter size*
- *2.1.2a-Percentage of producers who vaccinate for clostridial diseases*
- *2.1.3a-Percentage of sheep producers compliant with LPA biosecurity requirements*
- *4.1.1b-Emission intensity: kg of CO2e emitted per kg liveweight (LW) when raising sheep*
- *4.1.1c-Emission intensity: kg of CO2e emitted per kg greasy wool shorn*

They noted that data could be made available through a national level spreadsheet. As a private company, a private contract would need to be organised between MLA and AgriWebb.

Blackbox Co.– Medium risk (6)

Blackbox Co. is a private company that collects animals' production and supply chain data through the NLIS. Data is available from producers, processors, and abattoirs. Data can be utilised to replace or corroborate the national producer survey concerning biosecurity, environmental, animal welfare, and economic indicators. The data that is collected is focused on individual animal production and supply chain data, this includes genetics, weight, induction, paddock, sale, pregnancy, wet, dry, and health. This will be better suited to productivity than health; feedlot health is well recorded, but pasture is less detailed.

Aspect	Assessment	Explanation
Credibility	High risk	Blackbox is a private company.
Bias	Low risk	Likely biased toward more progressive and larger producers, with 350 clients, a sufficiently large sample size for robust findings. Cattle focused with early adopters in sheep.
Reliability	Medium risk	As methods are not publicly published, it is unclear whether they are or are expected to be reported consistently.
Timeliness	Unknown	Availability of reporting data is unclear.
Effort	Medium risk	Data is likely reported in a summary fashion but would incur cost to access.
Compliance	High risk	Blackbox methods and data are private and proprietary.
Longevity	Unknown	Longevity of reporting is unclear.

Blackbox reported collecting data concerning vaccinations, use of pain relief, husbandry practices, as well as cost of production. This makes it well suited to corroborating the national producer survey for the following indicators for the ABSF:

- 1.1-Percentage of producers using appropriate pain relief for invasive husbandry practices
- 1.2-Percentage of cattle receiving appropriate pain relief for invasive husbandry practices
- 5.4-Vaccination rates for clostridial diseases
- 5.5-Percentage/Number of producers undertaking low stress stock handling

As a private company, a contract would need to be organised between MLA and Blackbox Co.

CSIRO Habitat Condition Assessment System – Low risk (2)

A national biodiversity habitat condition assessment and reporting capability based on remote and spatial data as well as on ground condition assessments. Able to be utilised for forest and woodland cover indicators.

Aspect	Assessment	Explanation
Credibility	Medium risk	Independent government organisation.
Bias	Low risk	The data utilised is based on national observational datasets and randomised on ground assessments.
Reliability	Low risk	Standard reporting recently improved with finer resolution (250m to 90m), condition estimates, and addition of quantifying and reporting uncertainty.
Timeliness	Medium risk	The data model is updated infrequently, though is relevant for a number of years.
Effort	Low risk	Data is reported in a summary fashion and is free to access.
Compliance	Low risk	Methodology and data sources are publicly available and confirmed to meet reporting standards.
Longevity	Low risk	Reported for 10 years since 2015.

This could be utilised for the following indicators in the ABSF:

- 8.1-Percentage of regions achieving healthy groundcover thresholds
- 9.1-Percentage of national forest cover gain
- 9.2-Percentage of national forest cover loss
- 9.3-Percentage of national woodland cover gain
- 9.4-Percentage of national woodland cover loss

Accounting for Nature– Medium risk (4)

A model for environmental sustainability measurement and tracking developed by Wentworth Group, combined with standards and certification for accounts including government and non-government clients (farmers, producers, and private accounts). As a broad-based set of standards connected to a model for evaluation, it may be used for a variety of environmental indicators, though given the limited uptake and access it is yet unclear for which indicators it will be suited for. As a private company, a contract would need to be organised between MLA and Accounting for Nature.

Aspect	Assessment	Explanation
Credibility	Medium risk	The data source and method are held by an independent non-government organisation.
Bias	High risk	Though there are 8.5m ha of environmental accounts registered with the standard, which is a very small portion of Australia's 426m ha. Modelling is based on sampled on-the-ground data.

Reliability	Low risk	The data has been reliably reported since 2019. With additional integration with biodiversity credit markets and carbon credits in its roadmap.
Timeliness	Unknown	Availability of reporting data is unclear.
Effort	Medium risk	Data is reported in a summary format, though incurs a cost to access.
Compliance	Low risk	The methodology and findings are independently audited, all methods are publicly available.
Longevity	Low risk	The data has been reported for 6 years, since 2019.

AMPC Data Portal – Low risk (3)

The AMPC data portal will report using additional data from innovation managers and public submissions. This will include environmental and HR information, as well as workforce and economic data such as throughput, labour efficiency, line speed, and output. Data can be used to replace or corroborate the national producer survey concerning biosecurity, environmental, animal welfare, and economic indicators. This represents a shift toward integrated data collection.

Aspect	**Assessment**	**Explanation**
Credibility	Medium risk	AMPC is a research and development corporation
Bias	Low risk	Its network of 35 innovation managers ensure data is entered correctly for 50% of processors, to be open for other products to complete also.
Reliability	Medium risk	As a new data source, it is unclear whether data will be reported consistently.
Timeliness	Unknown	Availability of reporting data is unclear.
Effort	Medium risk	Data is reported in a summary fashion and free to access.
Compliance	Unknown	As a new data source, the compliance of the methods is unknown
Longevity	Unknown	It is unclear which data would have historical reference.

Net Zero CRC

The Net Zero CRC aims to become an exchange for emissions related data. Currently it is collecting data through its demo sites, though it has challenges in its data architecture that prevent collation and reporting.

At its early stage of development its methodology is not yet assessable, and so a risk assessment was not completed. In future, should it become the emissions data exchange it aims to be it could be used for the following indicators:

ABSF:

- 10.2-Net emissions: Mt of CO2e emitted by the beef industry
- 10.3-kg CO2e emitted per kg liveweight when raising beef
- 10.7-Net emissions: Mt of CO2e emitted by the beef industry over a 20-year time interval (GWP*)

SSF:

- 4.1.1a-Net emissions: Megatonnes (Mt) of CO2e generated by sheep industry (farm and sheep meat processing)
- 4.1.1b-Emission intensity: kg of CO2e emitted per kg liveweight (LW) when raising sheep
- 4.1.1c-Emission intensity: kg of CO2e emitted per kg greasy wool shorn

9.3 Key findings

9.3.1 Environmental data sources

Table 9.1 - Data risk assessment of environmental data sources

Data source	Overall risk	Environmental sustainability indicators	Credibility	Bias	Reliability	Timeliness	Effort	Compliance	Longevity
AMPC - Environmental Performance Review 2022	High risk	7	Medium risk	Medium risk	High risk	High risk	Medium risk	Medium risk	Medium risk
E.SSF.0001-National Producer Survey	High risk	7	Medium risk	Medium risk	Medium risk	Medium risk	High risk	Medium risk	Medium risk
E.SUB.00010 - Beef Industry trends analysis - 2020	Medium risk	2	Medium risk	Low risk	High risk	High risk	Medium risk	Medium risk	Low risk
E.SUS.0006 - Life Cycle Assessment of the Australian sheep industry / Pathways to low emissions in the Australian sheep industry	Medium risk	2	Medium risk	Low risk	High risk	High risk	Medium risk	Medium risk	Low risk
E.SUB.0007 - Cibo Labs	Medium risk	6	Medium risk	Low risk	High risk	Medium risk	Medium risk	Medium risk	Low risk
B.CCH.2124 – Red meat greenhouse gas emissions update 2021	Low risk	5	Low risk	Low risk	Medium risk	Low risk	Low risk	Low risk	Low risk
ABARES Productivity reporting	Low risk	1	Low risk	Low risk	Medium risk	Low risk	Low risk	Low Risk	Low risk

9.3.2 Supply chain data sources

Table 9.2 - Data risk assessment of ABS and ABARES data sources

Data source	Overall risk	People and community indicators	Economic and financial resilience indicators	Credibility	Bias	Reliability	Timeliness	Effort	Compliance	Longevity
ABS Value of production reporting	Medium risk	0	2	Low risk	Low risk	High risk	High risk	Low risk	Low risk	Low risk
ABS Census	Medium risk	9	0	Low risk	Low risk	Medium risk	Medium Risk	Low risk	Low risk	Low risk
Survey of R&D	Medium risk	0	1	Low risk	Medium risk	Medium risk	Low risk	Low risk	Low risk	Low risk
ABARES Commodity price reporting	Medium risk	0	1	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk

Table 9.3 - Count of indicators reliant on of survey data sources by theme

Organisation	Data source	Total indicators	Animal welfare indicators	Environmental sustainability indicators	People and community indicators	Economic and financial resilience indicators
Meat and Livestock Australia (MLA)	E.SSF.0001-National Producer Survey	**23**	13	7	3	0
Australian Bureau of Statistics (ABS)	ABS Census	**9**	0	0	9	0
Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)	ABARES Productivity reporting	**4**	0	1	0	3
Department of Agriculture, Fisheries and Forestry (DAFF)	National Residue Survey	**3**	0	0	2	1
University of Canberra	Regional Wellbeing Survey	**3**	0	0	3	0
Australian Bureau of Statistics (ABS)	ABS Value of production reporting	**2**	0	0	0	2
Australian Wool Exchange (AWEX)	National Wool Declaration Status (NWD)	**2**	1	0	0	1
Australian Wool Innovation (AWI)	AWI Global Brand Tracking Survey	**2**	0	0	2	0
Australian Wool Innovation (AWI)	AWI Reporting	**2**	0	0	0	2

Meat and Livestock Australia (MLA)	MLA Community sentiment research 2024	**2**	0	0	2	0
Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)	ABARES Commodity price reporting	**1**	0	0	0	1
Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)	ABARES Calculation on Australian Agricultural and Grazing Industries Survey (AAGIS).	**1**	**0**	**0**	**0**	**1**
Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)	ABARES Financial performance reporting	**1**	0	0	0	1
Australian Bureau of Statistics (ABS)	Survey of R&D	**1**	0	0	0	1
Australian Lot Feeders Association (ALFA)	ALFA shade survey	**1**	1	0	0	0
Department of Agriculture, Fisheries and Forestry (DAFF)	National disease reporting	**1**	1	0	0	0

9.3.3 Data sources attributed to risk driver

Table 9.4 - Data sources by data risk driver

Environmental indicator instability	Survey methodology instability	Perception	Data source	Overall risk rating
●		●	AMPC - Environmental Performance Review 2022	High risk
	●	●	E.SSF.0001-National Producer Survey	High risk
	●	●	ALFA shade survey	Medium risk
●		●	E.SUB.00010 - Beef Industry trends analysis - 2020	Medium risk
●		●	E.SUS.0006 - Life Cycle Assessment of the Australian sheep industry / Pathways to low emissions in the Australian sheep industry	Medium risk
●		●	E.SUB.0007 - Cibo Labs	Medium risk
	●	●	MLA Community sentiment research 2024	Medium risk
		●	MLA Red Meat Market Access Indicators	Medium risk
		●	Australian Livestock Processing Industry Animal Welfare Certification System (AAWCS)	Medium risk
	●		ABS Value of production reporting	Medium risk
		●	National Feedlot Accreditation Scheme (NFAS) reporting	Medium risk

Environmental indicator instability	Survey methodology instability	Perception	Data source	Overall risk rating
		●	ARCBA Polling data	Medium risk
	●		ABARES Commodity price reporting	Medium risk
	●		AWI Global Brand Tracking Survey	Medium risk
		●	MLA State of the Industry Report 2023	Medium risk
		●	Peak industry training (MLA, LiveCorp, AMPC)	Medium risk
		●	Livestock Production Assurance (LPA)	Medium risk
		●	NSQA sale-yard registration data	Medium risk
		●	National Wool Declaration Status (NWD)	Medium risk
	●		AWI Reporting	Medium risk
	●		ABS Census	Medium risk
	●		Regional Wellbeing Survey	Medium risk

Note: This list captures all medium and high-risk data sources. These sources comprise 90% of data source risk and are depended on by 70% of indicators.