



Final public report

Integrity System 2025 Strategy – Ex Ante Impact Assessment

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Abstract

Finalised in November 2018, the Integrity Systems Company's (ISC) IS2025 strategy seeks to grow the industry's competitive advantage through enhancements to red meat integrity systems and create value for participants within the value chain.

GHD critically reviewed the expected outcomes from IS2025, as well as the existing assumptions underpinning previous Integrity System impact modelling exercises. The results suggest that (in present dollars) IS2025 will return benefits of \$1,370m from an investment of \$156m, or \$8.8 for every \$1 invested. The additional \$48m investment in IS2025 over and above the Business as Usual (BAU) baseline, is expected to return marginal benefits of \$533m, or \$11.1 for every additional \$1 invested. Projected improvements to livestock traceability levels were identified to be the major driver of benefits for IS2025.

The findings suggest the IS2025 will deliver considerable benefits to the red meat sector, through increased protection from exotic diseases and contamination risks, as well as maintaining market price premiums in export markets. The ongoing automation of NVD and LPA data collection are also expected to reduce compliance costs and unlock opportunities for data based improvements to value chain productivity.

Acknowledgements

GHD acknowledge the input from key Meat and Livestock Australia (MLA) and ISC staff, as well as economic modelling completed by the Centre for International Economics (CIE).

Abbreviations

AADIS	Australian Animal Disease Spread
ABARES	Australian Bureau of Agricultural and Resource Economics
BAU	Business as Usual
BSE	Bovine Spongiform Encephalopathy (i.e. Mad Cow Disease)
CIE	The Centre for International Economics
EAD	Emergency Animal Disease
eNVD	Electronic National Vendor Declarations
FMD	Foot and Mouth Disease
IS	Integrity Systems
IS2025	Integrity System 2025 and Beyond Strategic Plan
ISC	Integrity Systems Company
LPA	Livestock Production Assurance
MLA	Meat and Livestock Australia
NLIS	National Livestock Identification System
NLTPS	National Livestock Traceability Performance Standards
NPV	Net Present Value
NRS	National Residue Survey
NVD	National Vendor Declarations
NZFAP	New Zealand Farm Assurance Programme
ROI	Return on Investment

1 Project background and objectives

GHD were engaged by the Integrity System Company (ISC) to conduct an economic analysis of the expected benefits that will accrue from ISC / MLA's investment in the Integrity System 2025 Strategic Plan (IS2025) over the period 2020-2025 and beyond. The outputs of this research will support and guide investment in the Strategy to maximise the potential returns to industry, and to inform ISC's measurement, evaluation and reporting activities that will underpin this strategic investment.

2 Methodology

IS2025 was reviewed to identify a range of expected outputs and outcomes under the following investment scenarios:

- **Without IS:** Assuming no industry-wide investment into integrity systems
- **Business as Usual (BAU):** Assuming Integrity Systems investment remains constant, without any new developments or improved capabilities.
- **IS2025:** Additional investment and delivery of the initiatives outlined within IS2025

Quantifiable economic benefits were evaluated using MLA productivity models, to determine the Overall Net Present Value (NPV) of Benefits and Costs, and the expected Return on Investment (ROI). Some of the expected benefits from IS2025 were considered too uncertain to quantify for the purposes of impact modelling. These benefits were qualitatively described with high level indicative estimates also provided.

2.1 Impact Assumptions

Table 1 below provides a summary of the identified benefits and impact assumptions under each of the investment scenarios. Note that some of the identified benefits (i.e. reduced risk of contamination events and reduce market closure times) were treated as updates to the existing baseline assumptions underpinning previous Integrity System impact modelling exercises, therefore not considered as additional benefits attributable to IS2025.

Table 1 Summary of identified benefits and changes to modelling assumptions under different 2020-25 integrity systems scenarios

Benefit	Without IS	BAU	IS2025
Improved traceability of sheep and goats*	70% (visual mob-based tags)	77% (25% uptake of individual animal ID)	Reaching 97% by 2026/27) (100% uptake of individual animal ID)
Improved traceability of cattle*	65% (visual mob-based tags)	94.3%	Reaching 97.3% by 2027/28 (3% improvement attributed automatic verification and NLIS database improvements)
Real-time livestock traceability allowing faster EAD response	Impact considered implicit in improved livestock traceability assumptions above (not additional benefit)		
Maintenance of export market price premiums	Premiums begin to decline in 2020/21	Premiums begin to decline in 2023/24 (assuming no additional investment beyond 2025)	Premiums begin to decline in 2025/26 (assuming no additional investment beyond 2025)
Reduced risk of contamination event	Baseline assumptions adjusted to incorporate the downside risk of a contamination event. Scenario: 25% loss of beef export market value for a duration of 0.5 years = \$1.35b cost (without IS trade impacted for 0.75 years = \$2.03b). Probability: 1 in 10 years		
Reduce market closure times	Baseline assumptions for market closure times (years) during EAD event halved.		
Reduced compliance cost for NVD completion (time to complete and error correction)	Paper NVDs = \$8.02 average transaction cost	Introduction of current eNVD reduces transaction cost to \$3.78 per	Introduction of automatic verification system reduces transaction cost to \$0.93 per transaction by 2028-29.

* Performance against the National Traceability Performance Standards (NLTPS).

Benefit	Without IS	BAU	IS2025
		transaction by 2027-28.	
Reduced compliance cost for LPA verification	Unchanged LPA audit costs (\$1.5m per annum, ~\$500 per in person LPA audit,)		In-person audits partially replaced with desktop compliance audits saving \$250 per audit
Reduced compliance and monitoring costs for government agencies and industry	Unchanged compliance costs, estimated at \$29.4m per annum across various state and territory departments and food safety authorities.		30% reduction in compliance costs for SAFEMEAT initiatives by 2025-26 = \$4.41m (after adjusting for 50% chance of success. Benefits shared 50% between agencies and industry.
Reduced cost for NRS	Unchanged with approximately \$7.2m of levy funds allocated to the NRS per annum.		IS data used to target NRS testing towards higher risk livestock and meat products, reducing costs by 50% from 2027-28 = \$3.6m (after accounting for chance of success 75% and attribution 50% annual benefits = approximately \$1.35m).
Data based improvements to value chain productivity	Unchanged		Unquantified benefits from the use of IS data to drive supply chain efficiency and other Big Data uses.

3 Results and key findings

The results and key findings are defined as primary quantified impacts and, additional unquantified impacts.

3.1 Identified impacts and updated assumptions

Table 2 below provides a summary of the impacts identified within this report and the modelling approach adopted. Primary impacts were quantified via MLA's existing ROI model which considers impacts via export price premiums and reduced disease risk. While additional productivity impacts (compliance cost savings) were quantified via MLA's productivity model. Finally, a number of identified impacts were considered too uncertain to quantify and attribute to IS2025.

Table 2 Summary of identified impacts and modelling approach

Identified impacts	Impact categories and modelling approach
Improved traceability of sheep and goats	Primary quantified impacts Incorporated into MLA's ROI model contributing to export market price premiums, avoided disease costs and compliance cost savings.
Improved traceability of cattle	
Real-time livestock traceability allowing faster EAD response	
Maintenance of export market price premiums	
Reduced risk of contamination event	
Reduced market closure times	
Reduced compliance costs for National Vendor Declaration (NVD) completion	Additional unquantified impacts Impacts considered too uncertain to quantify for the purposes of impact modelling.
Reduced compliance costs for Livestock Production Assurance (LPA) verification	
Reduced compliance and monitoring costs for government agencies and industry	
Reduced cost of the National Residue Survey (NRS)	
Data based improvements to value chain productivity	

3.2 Primary quantified impacts

Outlined below in Table 3 are the modelled benefits and costs of Integrity System (IS) investments, as a result of adjusted assumptions within MLA's ROI model, accounting for:

- Maintenance of export price premiums
- Improved livestock traceability levels; and
- Compliance cost savings

Table 3 Modelled benefits, costs and ROI

Unit		Business as Usual (BAU) investment into Integrity Systems	IS2025	Difference between IS2025 and BAU
Benefits				
Price premiums	NPV \$m ^A	233	360	127
Avoided cost of disease outbreak or contamination incident	NPV \$m ^A	515	887	372
NVD compliance cost savings	NPV \$m ^A	89	123	34
Total Benefits	NPV \$m^A	837	1370	533
Program Costs	NPV \$m^A	108^B	156	48
ROI	Ratio	7.7	8.8	11.1

^A Present value of benefits in 2024-25 dollars using a real rate of return of 5 per cent over the period 2020-21 to 2044-45.

^B ISC investments at 2025 real terms between 2020-21 to 2024-25. Source: CIE, MLA ROI models.

The results suggest that (in present dollars) IS2025 will return benefits of \$1,370m from an investment of \$156m, or \$8.8 for every \$1 invested. The additional \$48m investment in IS2025 over and above the BAU baseline, is expected to return marginal benefits of \$533m, or \$11.1 for every additional \$1 invested. Projected improvements to livestock traceability levels were the major driver of benefits for IS2025.

For context, the magnitude of total benefits expected to be delivered over the 5 year IS2025 investment (\$1,370m), can be compared to the present value of expected domestic and export sales of red meat over this period (\$123b, assuming 2018-19 sales of \$28.5b per annum, MLA 2020). Therefore, the expected benefits from IS2025 represent approximately 1% of domestic and export sales.

3.3 Additional unquantified impacts

Some of the expected benefits from IS2025 were considered too uncertain to quantify for the purposes of impact modelling. These benefits are summarised below in Table 4 with a high-level indicative estimate benefits, (for illustrative purposes only).

Table 4 Summary of additional unquantified impacts

Benefit	Indicative description and estimate of impacts
Reduced compliance cost for LPA verification	The current LPA compliance budget (~\$1.5m) delivers approximately 3,000 in person audits (\$500 per audit). A desktop audit utilising ISC systems could generate cost savings of \$250 per audit through reduced auditor travel and time.
Reduced compliance and monitoring costs for government agencies and industry	Approximately 30% reduction in compliance costs for SAFEMEAT initiatives by 2025-26 = \$4.41m per annum (after adjusting for 50% chance of success). Benefits shared 50% between agencies and industry.
Reduced cost of the NRS	IS data used to target NRS testing towards higher risk livestock and meat products, reducing costs by 50% from 2027-28 = \$3.6m per annum. After accounting for chance of success (75%) and attribution to IS (50%) annual benefits = Approximately \$1.35m.
Data based improvements to value chain productivity	Unquantified benefits from the use of IS data to drive supply chain efficiency and other Big Data uses.

3.4 Social and environmental outcomes

In addition to the economic impacts outlined in this report, IS2025 will deliver a range of social and environmental outcomes, particularly by reducing the risk of an exotic disease outbreak.

Social impacts

In helping to avoid extended and severe disease outbreaks in the Australian livestock industry, IS2025 is contributing to the avoidance of likely associated social impacts from such an outbreak. Buetre et al. (2013) categorised these impacts as follows

- Personal impacts: Reduced mental and physical health
- Household impacts: Social impacts of reduced income, strained and greater demands on family relationships
- Community impacts: reduced social cohesion, community activities and demands on community services

Significant social impacts were observed during and following the 2001 United Kingdom FMD outbreak, including an increase in suicide rates amongst farmers. A psychological assessment of the impact of FMD also noted that farmers in the impacted area had significantly higher psychological morbidity scores compared to farmers in non-impacted areas (Peck et al., 2002).

Animal welfare and environmental impacts

In the event of an exotic animal disease outbreak, large numbers of livestock are likely to be humanely destroyed, compounding the social impacts of producers and the broader community.

By avoiding and limiting the extent of major disease outbreaks in Australia, IS2025 is also reducing the likelihood of exotic disease incursion and therefore the widespread humane destruction of livestock often required for eradication.

More broadly, by helping to underpin the economic prosperity of the Australian livestock industry, Integrity Systems indirectly helps to provide producers with the resources needed to maintain and improve the health and welfare of livestock, as well as the condition of natural resources.

3.5 Distribution of benefits

The primary quantified benefits from IS2025 relate to price premiums and reduced risk of disease outbreak or contamination, which will broadly be shared amongst producers and other sections of the red meat industry including processors and lot feeders.

Buetre et al. (2013) estimated that a large FMD outbreak would reduce Australia's gross domestic product by 0.16% over 10 years, in present dollars.

3.6 Unintended consequences

GHD cannot foresee any significant unintended consequences from IS2025 which might disadvantage any section of the red meat industry or the broader community. However, there are some risks which will need to be managed, including:

- **Protection of privacy:** Without maintaining appropriate protocols and safeguards collected data on individual animals and properties could be misused.
- **Protection of individual business competitive advantages:** Integrity Systems aim to maintain the Australian red-meat sectors broad competitive advantage over international competitors. This should not limit the efforts of individual producers, processors or supply chains to pursue their own competitive advantages, for example differentiation through unique traceability, product validation, branding and marketing systems and technology.

4 Benefits to industry

The findings within this report suggest that IS2025 will deliver considerable benefits to the red-meat sector, through increased protection from exotic diseases and contamination risks, as well as maintaining price premiums in export markets. The progressive automation of NVD and LPA data collection are also expected to reduce compliance costs and unlock opportunities for data based improvements to value chain productivity.

5 Future research and recommendations

The analysis within this report relies on a range of assumptions around system development, uptake and impact. As IS2025 is implemented, progress may be tracked against these assumptions to determine the extent to which expected benefits are being realised.

Additional analysis might also be undertaken to validate some of the underlying assumptions used in the impact modelling exercise including better modelling of the effects on overseas markets of a contamination or disease incident. In particular consideration should be given to undertaking updated disease spread modelling to understand how improvements in livestock traceability, including the adoption of electronic tagging for sheep and goats and potential for real-time traceability in the future, might allow for a faster disease response and limit the potential spread. The outcomes from this epidemiological modelling could in turn be used to provide an updated assessment of the likely socioeconomic costs from an exotic disease outbreak.[†]

[†] Currently the ROI modelling relies on the analysis completed by Buetre et al. for ABARES in 2013, which relied on the AusSpread epidemiological model, which has since been superseded by the AADIS model developed by Bradhurst et al. (2015) and is more capable of modelling the spread of national outbreaks and control activities.

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7 Scope and Limitations

This public report has been developed from the full GHD report from ISC Project V.ISC.2021 - Integrity System 2025 Strategy Ex Ante Impact Assessment dated 19th April 2021. The scope, limitations and assumptions detailed in the full report apply to this public report, namely:

- The opinions, conclusions and any recommendations in the report are based on assumptions made by GHD described in the report. GHD disclaims liability arising from any of the assumptions being incorrect.
- GHD has prepared the report on the basis of information provided by Integrity Systems Company Limited and others, who provided information to GHD (including Government authorities, MLA and Centre for International Economics), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.
- The analysis in the report relies on a range of assumptions outlined throughout. These assumptions broadly relate to current and future disease cost and probability, price premiums, cost savings and uptake of innovations. Assumptions are based on available information and professional judgement at the time of writing. Given the uncertainty around future outcomes, GHD sought to adopt a generally conservative approach to assessing future benefits.
- GHD relied on the Centre for International Economics (CIE) to update MLA impact models with the revised assumptions within this report, determining the quantum of impacts.

Document control

Revision	Author	Reviewer		Approved for issue		
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Draft A	Fiona Yu	Michael White				13/05/2021
Draft B	Michael White	Seamus Hoban		Michael White		14/05/2021

