Final report

Supply chain integrity desirability analysis

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Abstract

The purpose of this research is to better understand the supply chain integrity factors that influence relationships between Australian processors/exporters/brand owners and the final consumer. More specifically, the study attempts to unpack how the whole notion of product integrity is being interpreted in the current trading environment including which product integrity factors red meat marketers view to be the most important; what strategies they are adopting to enhance their integrity; and how their brand value propositions are being differentiated through integrity.

The methodology employed a scan of the most recent literature on product integrity applicable to red meat; an extensive program of qualitative research in the form of consultation with export and domestic supply chain stakeholders; and case studies were developed to illustrate key learnings.

In defining product integrity, the report makes the distinction between **intrinsic integrity factors** (i.e. those inherent to the product such as food safety, truth in labelling, etc.) and **extrinsic integrity factors** (which are largely value judgments about the provenance of the product and how it was produced). The research found that, as the meat industry has transitioned into brand-based marketing, extrinsic integrity factors are growing in importance as they have become the basis for brand differentiation. However, Australia's status as the most trusted supplier of red meat in key export markets (i.e. the 'Brand Australia' factor), is underpinned by leadership in the intrinsic safety factors, which have traditionally been the basis of enhancing the value of Australian red meat.

The intent is that this knowledge will be applied by industry to assist marketers to leverage and protect their brands and effectively 'premiumise' their offerings based on integrity factors. This report also aims to provide insights as to the new directions that the integrity issue is taking in order to guide readers as to what strategies both brand owners and the industry need to adopt in order to maintain Australia's global leadership in product integrity. The findings of the report will assist individual exporters in framing their brand strategies and industry leaders in setting priorities for future investment to protect Australia's leadership position in product integrity along the supply chain.

Executive summary

Background

The purpose of this research is to determine how meat marketers can leverage and protect brands and effectively, 'premiumise' their offerings to extract incremental value based on selected integrity factors.

This project flows from past MLA Project V.MFS. 0447 *Commercial application of supply chain integrity and shelf-life systems,* also conducted by McKINNA *et al* (2020). While the earlier study focused on 'the how' (i.e. the integrity systems or technology), this project aims to explore 'the why' (i.e. the elements that drive purchases and why integrity matters) in greater detail and that the role of technology. The study found that the factors that do enhance value are increasingly those that lift extrinsic value. The report distinguishes **intrinsic integrity factors** (i.e. those inherent to the product such as food safety, truth in labelling, etc.) and **extrinsic integrity factors** (which are largely value judgments about the provenance of the product and how it was produced).

The research found that as the meat industry has transitioned into brand-based marketing, extrinsic integrity factors are growing in importance as they have become the basis for brand differentiation, however, Australia's status as the most trusted supplier of red meat in key export markets (i.e. the 'Brand Australia' factor), is underpinned by leadership in the intrinsic safety factors, which have historically been the basis of enhancing the value of Australian red meat.

Objectives

The central aim of the project was initially to test the proposition that there are middle market segments in both domestic and export markets which would pay an additional amount over and above the commodity price of Australian red meat for enhanced integrity factors. This specific proposition was quickly dispelled and more applicable learnings emerged from the secondary aims of the project i.e. providing a deeper understanding of product integrity, how perceptions of integrity are evolving and how integrity factors can be applied by brand owners and the industry as a whole to extract incremental value in domestic and export markets.

Methodology

The project methodology entailed a scan of more recent literature relevant to the red meat industry; engagement with red meat buyers, processors, marketers and exporters; and development of case studies to illustrate the learnings in the final report.

Results/key findings

In defining product integrity, a distinction can be made between **intrinsic integrity factors** (i.e. those inherent to the product such as food safety, truth in labelling, etc.) and **extrinsic integrity factors** (which are largely value judgments about the provenance of the product and how it was produced). The research found that, as the meat industry has transitioned into brand-based marketing, extrinsic integrity factors are growing in importance as they have become the basis for brand differentiation. However, Australia's status as the most trusted supplier of red meat in key export markets (i.e. the 'Brand Australia' factor), is underpinned by leadership in the intrinsic safety factors, which have traditionally been the basis of enhancing the value of Australian red meat.

Benefits to industry

The benefit of this research to industry is an improved understanding of how intrinsic and extrinsic integrity factors differ but both contribute to Australia's competitive advantage in red meat.

Future research and recommendations

The report recommends the following:

1. A regular review of Australia's product integrity platforms to ensure that the system remains fit-for-purpose and continues to underpin Australia's competitive advantage in global markets.
2. Continuing discussions with industry and other stakeholders about the agrifood data exchange concept to ensure it reaches its full potential to increase efficiency and accuracy of integrity data management.
3. Considering how ESG (environment, social, governance) factors can be incorporated into industry systems and align with the ESG activities that are happening at a business level.
4. Continued strategic investment in pilot projects on emerging product integrity technologies and information forums to demonstrate how value may be gained for the industry.

Table of acronyms

ALFA	Australian Lot Feeders Association
AMIC	Australian Meat Industry Corporation
BRC	British Retail Consortium (Standards)
B2B	Business to business (i.e. wholesale)
B2C	Business to consumer (i.e. retail)
CSR	Corporate Social Responsibility
ESG	Environmental, Social, Governance
HGP	Hormonal Growth Promotants
GHG	Green House Gasses
GMO	Genetically Modified Organism
ISO	International Standards Organisation
LPA	Livestock Production Assurance
MLA	Meat and Livestock Australia
IoT	Internet of Things
ISC	Integrity Systems Company
MSA	Meat Standards Australia
NVD	National Vendor Declaration
NLIS	National Livestock Identification System
NRS	National Residue Survey
QSR	Quick Service Restaurant
RD&E	Research Development and Extension

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1. Background

The purpose of this research is to determine how meat marketers can leverage and protect brands and effectively, 'premiumise' their offerings to extract incremental value based on selected integrity factors. The approach to answering this question included a scan of recent literature and extensive consultation with red meat industry stakeholders along the export and domestic supply chains that service both retail and foodservice channels.

This project flows from Project V.MFS. 0447 *Commercial application of supply chain integrity and shelf-life systems,* also conducted by McKINNA *et al* (2020). While the earlier study focused on 'the how' (i.e. the integrity systems or technology), this project aims to explore 'the why' (i.e. the elements that drive purchases and why integrity matters) in greater detail. The previous study found that many exporters had invested significantly in various technologies to enhance their integrity systems, particularly around traceability, accountability and transparency but found that these enhancements were not valued by customers and consumers to the extent that they were prepared to pay more for the product. The study found that the factors that do enhance value are increasingly those that lift extrinsic value. The report distinguishes **intrinsic integrity factors** (i.e. those inherent to the product such as food safety, truth in labelling, etc.) and **extrinsic integrity factors** (which are largely value judgments about the provenance of the product and how it was produced). It was discovered that this concept of intrinsic and extrinsic factors has also been proposed by Liu *et al* (2022) in a study on consumer perceptions of beef quality which observed that perceptions of quality are multifactorial and include credence factors. The article by Liu *et al* was published after the literature review and first draft of this report was submitted.

The benefit of this research to industry is an improved understanding of how intrinsic and extrinsic integrity factors differ but both contribute to Australia's competitive advantage in red meat.

2. Objectives

The central aim of the project was to test the proposition that there are middle market segments in both domestic and export markets which would pay an additional amount over and above the commodity price of Australian red meat for enhanced integrity factors. The secondary aims of the project were to provide a deeper understanding of product integrity, how perceptions of integrity are evolving and how integrity factors can be applied by brand owners and the industry as a whole to extract incremental value in domestic and export markets. The objectives of the project were met in that an improved understanding of the issues was the outcome.

3. Methodology

The project methodology entailed seven distinct steps as outlined below:

Step 1: Project planning

Step 2: Document discovery and review

Step 3: Development of engagement plan

Step 4: Domestic market major customer engagement

Step 5: Exporter engagement (list of participants noted in appendix)

Step 6: Case studies

Step 7: Analysis and reporting

The above methodology was found to be sufficient and fit for purpose.

4. Results

The competitive advantage of Australian red meat in product integrity comprises two components: the **intrinsic factors** that are largely reflected in Brand Australia based on industry and government regulatory frameworks; and the **extrinsic factors** that are expressed in the industry's proprietary brands based on factors such as provenance. Collectively, these two factors deliver significant, but varying price premiums for Australian exporters.

The study found that marketers can and do add value to Australian red meat through enhanced integrity factors but that increasingly, this is through investing in extrinsic rather than intrinsic elements of product integrity. At present, this value rests in the premium proprietary brands, but because of a societal shift in values towards greater integrity more broadly, it is likely that this value accretion could eventually lift the value of red meat in middle markets as well.

The research findings suggest that leadership in the intrinsic elements of product integrity (i.e. food safety and traceability) will need to remain a central platform of the Australian industry's comparative advantage in global markets because it offsets the far higher cost of production in Australia compared to that of competitors. Exporters feel that it should be up to industry bodies to protect and enhance the intrinsic factors because it benefits the industry as a whole rather than individual brand owners. Australian red meat brand owners are also forging leadership in extrinsic integrity factors and this presents new opportunities to lift the value of Australian red meat, including in middle markets as their consumers become more sophisticated.

The feedback from industry suggests that consumers (and therefore customers) are increasingly judging meat quality on more than the eating experience alone. The provenance and story behind the product is now a driver of the purchase decision and the extrinsic integrity factors are assumed to be part of the of the product's quality and overall value proposition.

The answer to the central question posed in the project brief is that it is indeed possible to lift the value of Australian meat in middle markets, but this is likely to be through brand owners enhancing their extrinsic integrity factors, while at the same time the industry bodies protect Australia's existing systems and frameworks that assure intrinsic integrity.

5. Conclusions

In summary, the conclusions from this study are:

1. *Perceptions and expectations of product integrity are constantly evolving and the new frontier of integrity is moving beyond traceability and food safety.*
2. *Product integrity remains a critical element in the global competitiveness of the Australian red meat industry and all stakeholders have a role in advancing and protecting it.*
3. *It is difficult for brand owners to extract incremental value from enhancing intrinsic integrity factors because food safety is expected and taken for granted by customers and consumers, so they will not pay a premium for it.*
4. *Incremental value for exporters is being created through enhancing extrinsic integrity factors and linking these factors to premium brands.*
5. *Because Australia's leadership in intrinsic product integrity factors is embraced in the Brand Australia value proposition, exporters believe that it is the role of industry bodies to control, protect and continuously improve Australia's core integrity systems to maintain this leadership.*

6. *Brand owners see that it is to their advantage to enhance the extrinsic integrity factors as this is where they can add value to their premium brands by responding to the growing societal trend for greater integrity in all aspects of life.*
7. *Any compromise or failure in Australia's product integrity systems would be very damaging to the industry's global competitiveness and would impact the ability of brand owners to maintain their current price premium.*

6. Key findings

The key findings of the research are as follows:

Key learning 1: Product integrity is an evolving and nebulous concept

Key learning 2: Brands have taken over from government and industry technical compliance as a source of trust

Key learning 3: Brand Australia has provided the scaffolding for exporters to build proprietary brands

Key learning 4: Australia's early investment in product integrity has paid off

Key learning 5: Brand differentiation is now only possible through extrinsic factors

Key learning 6: The next frontier of product integrity is ESG

Key learning 7: The lines between quality and integrity are blurring

Key learning 8 : Technical integrity is still relevant for low value meat

Key learning 9: Australia must stay retain leadership in product integrity.

7. Benefits to industry

The benefit of this research to industry is an improved understanding of how intrinsic and extrinsic integrity factors differ but both contribute to Australia's competitive advantage in red meat.

8. Future research and recommendations

This research has allowed the authors to identify several potential areas of research or opportunities to apply insights that are worthy of consideration by MLA to advance the effectiveness and global competitiveness of red meat product integrity. These are as follows:

1. *A regular review of Australia's product integrity platforms to ensure that the system remains fit-for-purpose and continues to underpin Australia's competitive advantage in global markets.*

Given the pivotal importance of product integrity to Australia's global competitiveness, it is critical that the industry maintains a leadership position in terms of global best practice systems and processes. The current platform comprises a patchwork of single-purpose systems managed by multiple stakeholders including government agencies, the various industry representative bodies, private providers and NGOs. Exporters are of the view that what is needed is an independent 'whole of supply chain' oversight, aimed at assessing the effectiveness and efficiency of each element, benchmarked against best practice. Continuous improvement should be the mandate of this body, so this type of review needs to be undertaken regularly.

2. *Continuing discussions with industry and other stakeholders about the agrifood data exchange concept to ensure it reaches its full potential to increase efficiency and accuracy of integrity data management.*

There is strong industry interest and support for a master data exchange with standardised data management protocols, which would securely hold the various data sets required for compliance. This would greatly streamline the compliance process, remove duplication and significantly reduce supply chain costs. This work could be conducted in parallel with the Agrifood Data Exchange project, currently in the early stage of development and provide a fall-back position if the national 'whole of agriculture' project does not progress.

3. *Considering how ESG (environment, social, governance) factors can be incorporated into industry systems and align with the ESG activities that are happening at a business level.*

ESG is the new frontier in product integrity. Virtually, all the businesses interviewed were at various stages of developing or considering ESG plans and while the larger processors were well advanced, some business operators indicated that there were struggling with this. There is a widespread recognition that ESG integrity issues will rapidly escalate and there will be an increasing need to respond to customer and societal pressures, particularly around carbon reduction. Businesses would be highly receptive to any activity that aligns industry action on extrinsic integrity factors to the ESG plans of their own business. Background research may be needed at an industry level to develop the attributes of ESG, understand societal expectations and build a code of best practice behaviours. It may be useful to present this information in a tool kit format for those businesses that are just starting out on the ESG journey to use.

As is highlighted in the body of the report, it will be important that there is an industry-wide plan, which is probably underway. If not, this deserves to be given high priority by the industry and the groundwork for the development of the plan done as part of the same project.

5. *Continued strategic investment in pilot projects on emerging product integrity technologies and information forums to demonstrate how value may be gained for the industry.*

The current investment in pilot projects, whereby MLA provides targeted funding support for meat businesses to work with technology providers is extremely valuable in advancing Australia's leadership in product integrity and should be continued. As part of this work, it would be valuable to MLA to periodically run information briefing sessions for technology providers to bring them up to date on the industry state of play with product integrity and priorities.

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Appendix 1: Report findings in full

1. Structure of reporting

The findings from the research and analysis for this project are presented in full in this section of the document with the following report structure:

1. Structure of reporting
2. Literature scan findings
3. Consultation findings
4. Case study learnings
5. Implications for the Australian meat industry
6. Recommendations.

2. Literature scan findings

Subsequent to the previous study by McKINNA *et al* (V.MFS.0447, 2020) that explored the relevance and efficacy of the technologies that could enable improved product integrity in red meat supply chains, MLA commissioned a market research study by Kantar to assess the role of integrity systems in building trust in Australian beef in five key export markets as well as some domestic consumer research. In an effort to capture shifts in thinking on the subject of product integrity, this literature scan explores research from the same general time frame as these two MLA studies with the additional papers being identified from an internet scan.

2.1 Recapping learnings from project V.MFS.0447

A key finding from Project V.MFS.0447 *Commercial application of supply chain integrity and shelf-life systems* (McKINNA *et al* 2020) was that Australian red meat exporters generally achieve a substantial premium over suppliers from competing countries because of customer and market perceptions of Australia's superior product integrity credentials in red meat. The magnitude of the premium varies by cut, market and market channel. This premium is derived from the brand equity which comprises two components:

1. The *'Brand Australia'* component, which stems from customer trust in Australia's systems, processes, and regulations (both from industry and Government); and
2. The processor's brand equity, based on product quality and eating characteristics or simply the company's reputation as a reliable supplier.

For consumers who shop in high-end retail outlets, the trust that underpins their willingness to pay a premium is largely based around the retailer's brand/s. High-end retailers fiercely protect this trust by dealing only with exporters who they in turn can trust, based on proof of robust integrity systems and the retailer's own QA systems.

Predominantly, trade in premium products with high end customers is based on short supply chains where the exporter typically deals directly with the end customer with line of sight of the product through the supply chain. In contrast, most of the trade in commodity meat is through a series of intermediaries where the processor/exporter has little knowledge of the product journey once it leaves their plant, nor under whose brand it is ultimately sold.

In recent years, Australian meat exporters have been focused on building the value of their premium brands through differentiation based on enhanced eating quality and integrity attributes such as authenticity of breed, provenance, traceability, cold chain integrity and more. The relevance and level of importance of these attributes varies by customer/market/segment/cut and price point.

Exporter investment in integrity systems to date has largely been made to support trade of higher end cuts to premium retailers and foodservice customers. Secondary cuts and product from lower quality carcasses are predominantly sold through intermediary channels such as importer/wholesalers and are either unbranded, marketed under generic brands or rebranded with a wholesaler's brand. Essentially, Australian meat exporters have concentrated on building integrity systems to meet the needs of high-end customers with less focus on building direct relationships or brand equity in the middle tier market channels. McKINNA *et al's* project work in other export categories indicates that there has been substantial growth in the mid-tier commodity channels, particularly since COVID 19. For example, on-line home delivery and meal kits have grown their share of the consumer food dollar in many markets. There has also been growth in marketing meal components and meal solutions with mainstream retailers as well as value-added portions for foodservice channels.

In summary, the key learnings from Project V.MFS.0447 were:

1. The industry views on the need for investment in enhanced supply chain integrity systems and technologies are at odds with those of researchers and technology/service providers who are advocating greater investment in IoT (Internet of Things) devices and software. Meat industry business operators strongly associate supply chain integrity systems with 'traceability', which they believe is already more than adequate in the Australian meat industry and so they do not see the need for this investment.
2. Supply chain integrity technologies are highly complex and constantly evolving with implementation challenges for both meat businesses and providers.
3. There *are* justifications beyond just traceability for investment, including: improved supply chain management; reduced risk of fraud; extended shelf life; reduced operating and wastage costs; accommodating rising retailer expectations; and access to immediate market feedback.
4. Investment in product integrity technologies comes at a cost to the business and therefore, they need to gain benefits other than product integrity to justify investment.
5. There is a strong argument for industry-level investment in integrity systems that will protect Brand Australia in export markets.

2.2 Validating perceptions of integrity

As recommended in the 2020 MLA study *Commercial application of supply chain integrity and shelf-life systems (ibid)*, MLA commissioned research agency Kantar to deliver a stage of in-market and domestic research to unravel the complex issue of perceptions of product integrity in red meat. Known as 'Project Cyclone' the study explores in depth how customers and consumers interpret and engage with the whole notion of product integrity in red meat. The aim of the study was to identify how MLA can ensure integrity systems are fulfilling their contribution to making Australian beef the most trusted red meat across all markets, amongst stakeholders at all parts of the value chain.

Project Cyclone (V.RDA.2011, 2021), '*The role of integrity and traceability systems in building trust in Australian beef'* involved qualitative interviews with trade customers, retailers and consumers in Australia, Japan, Singapore, South Korea, and the UAE. The consultation reach gives good representative coverage of the major Australian export markets, although it does not include China, Australia's largest beef market. The issue of product integrity in red meat in China has been hotly debated within the Australian meat industry. Both exporters and consumers themselves believe food fraud and product misrepresentation to be common in China and have shown a greater propensity to pay a premium for enhanced assurance of integrity on this basis.

The Kantar study also omits foodservice customers, yet in most export markets, foodservice usage accounts for a high percentage of the total market (in some cases equal to, or larger than retail). Relevant learnings about foodservice would, however, be reflected to some extent in the trade interviews reported by Kantar. It is understood that the demographic samples were vetted by income and were regular red meat buyers/consumers who shop at modern supermarkets. The research reach may have missed the lower socio-economic end of the market including consumers more likely to buy cheaper cuts from wet markets and budget retail outlets.

The 'Project Cyclone' report significantly adds to the understanding of the complex issue of consumer perceptions of integrity in red meat marketing more broadly. The most profound insight of the study is the discussion around the subliminal nature of product integrity i.e. 'integrity' is not a top-of-mind issue for trade, retailers nor consumers, but all customers and consumers do gain peace of mind from knowing that such systems are in place.

Significantly, while Australia is the most trusted supplier of red meat, its product integrity systems are not perceived to be any better or worse than competitor supply countries. Therefore, despite the enormous effort and investment to lead the world in the integrity systems for red meat supply chains, the Australian red meat Industry does not have a discernible competitive advantage based on product integrity. The Kantar study indicates that Australia's integrity systems are generally viewed as being good, but not necessarily the best, and that competitor export countries are perceived to have similarly strong integrity systems. The outcome of this situation is that Australia's world class red meat integrity system is ***not*** seen to be a differentiator in terms of the purchase decision. Although the Australian meat industry provides a significant amount of detail and transparency about how the integrity systems function, both trade and retail customers have only a general, high-level understanding and only take a close interest in product integrity systems when there is a problem or complaints. Notably, consumers are not seeking detail on the technical aspects of the supply chain integrity practices and are less aware of the benefits of traceability systems.

An important finding of the Kantar report is that, in the mind of overseas consumers, the key differentiator for Australian red meat in export markets is 'eating quality' judged largely by taste, which in the meat industry is a function of technical attributes such as sex, age breed, feedlot days, etc. However, the Kantar study suggests that consumers perceive that the superior taste of Australian beef is instead associated with attributes such as natural, unspoilt pastures; Australia's overall environmental credentials; grass-fed, ethical, and humane production; which are all perceived to translate into positive health benefits. Interestingly, to a large extent these factors are all integrity factors and are not related to traceability. The closest competitor to Australian meat is US meat, which the research suggests, is seen to be tainted by antibiotics and hormones.

Clearly 'product quality' and 'product integrity' are inextricably linked and there is a blurred line between concepts of 'quality' and 'integrity' in the minds of the consumer and customer. Australia's quality image is lifted by perceptions of clean and humane farming processes, which would generally be judged to be product integrity attributes. The inference from the Kantar study is that consumers perceive that Australian red meat tastes better, largely because of the way that it is produced.

In all three of the cohorts interviewed by the Kantar researchers, confidence in Australian red meat came from knowing that systems and processes that assure product safety are indeed in place, but respondents indicated that they did not need to understand the detail about these systems in any depth.

The Kantar study confirms that integrity is all about trust, with the whole notion of 'trust' being viewed through slightly different lenses by the trade, retailers, and consumers. For **trade customers**, 'trust' is the peace of mind obtained by knowing that they will consistently receive the product they order and that they have access to the information they need to manage relationships with their own customers and ensure efficiency in their own supply chains. **Retailers** on the other hand, are driven by operational efficiency. For retailers, 'trust' is about consistency in product quality and reliability of supply and the ability to manage inventory and price points. For **consumers**, 'trust' is largely about consistency in the eating experience of that brand of meat (including brand Australia), but as mentioned earlier, in the consumer's mind, product integrity is broader than the technical aspects that influence eating quality, it also embraces the so-called 'credence factors', which they believe contribute to healthier food choices.

The Kantar report illustrates that trust is effectively transferred down the supply chain, from trade to retailer, and then retailer to consumer. The Kantar authors describe perceptions about traceability as being like the 'invisible hand' guiding verification from farm to table. This 'invisible hand' is commonly attributed to government integrity enforcement rather than industry systems. Government regulation is thought to be providing incontrovertible proof of the integrity through the supply chain. Beyond government regulation, consumers largely trust the retailer brand, supported with on-pack and point of sale information.

The Kantar report is inconclusive about the willingness of consumers and trade to pay a premium for enhanced trust in red meat integrity, except to say that only some consumers are willing to pay a higher price for premium quality, particularly for premium cuts.

The findings in the Kantar work highlight the fact that food safety in Australian meat is implicit and assumed in both the domestic and the export markets studied, based on government regulatory systems. However, the report suggests that this presumption of safety across the value chain risks eroding the value of the investment that the Australian industry has made in the integrity systems that underpin the country-of-origin proposition and that Australia's food safety credentials need to be called out more strongly to become a differentiating factor in purchase choice. This is a somewhat vexed proposition because raising awareness of food safety issues could unnecessarily risk triggering concern about the safety of red meat generally.

The report downplays the importance of integrity by consistently reinforcing the proposition that product integrity is not in itself *currently* a purchase driver. The research states that product quality is the prime purchase driver and for trade and retail customers, operational efficiency and waste reduction are also considerations. However, it is important to reiterate that many of the factors that the market judge to be 'quality' attributes are in fact 'integrity' attributes and this fact has not been called out in the marketing of 'brand Australia' as it applies to red meat. Product integrity is currently a 'back-of-mind' or implicit issue framed around product traceability and safety of which most customers and consumers have only a vague understanding. The study highlights important differences between trade, retailer, and consumer perceptions of the notion of 'integrity' in red meat as outlined below:

Trade

Trade customers perceive that integrity is about eligibility criteria (i.e. does it meet industry quality standards and government and industry processing and safety standards) and product specifications (breed, feed, cut size, weight, quantity, cold chain control). The trade see integrity as whether the product they receive is in fact the product that it is claimed to be and the product that they ordered.

Retailers

Retailers are driven by business efficiency, but product quality is also critical. They see integrity as being assurance of:

- Control over stock flows and use by dates to minimise wastage
- Product that matches order specifications and is delivered in full and on time
- Consistent quality and early notifications for changes in quality or cut size, marbling, etc.

Consumers

Consumers use the measures of taste and meal outcomes as a signifier of quality. Product safety is assumed and implicit. Interestingly, taste is judged by freshness, juiciness, and mouthfeel but the research report makes no mention of 'tenderness', which is the centrepiece of the MSA grading system. Perhaps this is just a matter of terminology. Beef is judged at the point of sale by the appearance (colour, marbling, freshness), on pack claims and retailer brand associations. Country of origin labelling is a marker for trust in safety and quality. The report indicates that some consumers also balance factors such as taste and health benefits, grass-fed, ethically produced, free from antibiotics and hormones as all equating to 'better for me'. Again, the research findings make no reference to environmental sustainability or carbon emissions specifically as a product integrity attribute, yet major retailers globally are heavily investing to build their sustainability credentials as an integral part of their brands.

2.3 Inspiring trust in Brand Australia

Inspiring trust is fundamental to the strength of the Australian country of origin brand because it is this hard-won trust that sustains the belief that Australian beef is processed to the highest standards. Trust in the Australian country of origin brand largely comes from perceptions of Australia as being a large, natural, sparsely populated landscape (the so called 'clean and green' image) that produces clean and naturally wholesome food. There is also evidence that perceptions exist of agricultural expertise and product reliability based on a track record of consistent performance. Australia's country-of-origin brand perceptions also encompass the values of responsible, ethical, and humane practices. For all cohorts studied in the Kantar research, trust is underpinned by confidence in Australia's regulations and food safety governance, yet with limited understanding of the specifics that underpin them.

The Kantar report suggests that there is an opportunity to amplify perceptions of Australian quality by building greater customer and consumer awareness of Australia's traceability and integrity systems. We question this recommendation, given that the research has already told us that all three stakeholders (trade, retailer, and consumer) are comfortable in the knowledge that integrity systems exist and have peace of mind that they are being scrutinised by government. As all cohorts show little interest in knowing the specifics, the wisdom of investing industry funds to communicate the detail about Australian traceability and food safety systems must be questioned. The preceding McKINNA *et al* (2020) report also concluded that consumers and customers had little interest in knowing the details of Australia's red meat food safety systems, because they already have reassurance that government and industry are scrutinising them. Exporters interviewed in the McKINNA *et al* 2020 report indicated that QR codes that provided detailed information on product provenance and traceability had very low consumer uptake, requiring a promotional element to drive scanning of them. This experience suggests that building awareness of integrity systems would do little to drive consumption at this point in time, although a future food safety or integrity incident in the market could change this (e.g. the European horsemeat scandal of 2013). The important distinction in this discussion lies in the definition of 'integrity', i.e. while it probably would not bolster Australia's red meat credentials for stakeholders to know more detail about the supply chain technology underpinning food safety, a very powerful strategy may be to put more focus into communicating Australia's credence values as a central theme of the industry's product integrity story. This learning is not explicitly stated in the Kantar report but through a fresh set of eyes, it is a key outtake hidden in the research reporting. This suggestion is supported by the findings elsewhere in the literature scan.

2.4 Recent Australian research on integrity issues

The study of supply chain integrity in Australia has accelerated in recent years. Because so many of Australia's agrifood exports are commodities, their value propositions are centred around 'Brand Australia' making the integrity credentials of Brand Australia more critical. Therefore, the subject of integrity has deeply interested peak industry bodies and research institutions. Despite its importance, there does not appear to be significant research on the detail of how to leverage integrity factors for greater value in specific markets. In the Australian food industry lexicon 'integrity' still seems to refer to supply chain traceability, when clearly it embraces much more. Therefore, much of the literature focuses on blockchain.

While the uptake of blockchain systems is growing in the food industry as businesses feel compelled to perfect traceability, the ability of blockchain to enhance product integrity is being called into question. Despite having vested commercial interests in blockchain through the associated Beefledger product, Powell *et al* (2021) surmise that the data itself may be *'immutable garbage'.* Although blockchain ensures that data contained within cannot be compromised, supply chain actors cannot guarantee that the data loaded by all supply chain players is truthful. On top of that there is human error. Powell *et al* note that there are challenges in aligning the various formats of the data available from multiple devices and operating systems (as confirmed in the consultation for the McKINNA *et al* 2020 study). Data may also be compromised by faulty IoT devices or other system failures. Powell *et al* concede that no amount of technology can completely assure the promised attributes are delivered. While many see blockchain as the proposed solution to instilling trust, they point out that even when trading through a blockchain ledger, trust is still at play in the business transaction because meat exporters are often trading with strangers. They note that successful economies rely on some measure of transactional dependability underpinned by the rule of law. An Australian meat exporter is always weighing up the risk of trading in an environment of zero trust with a perishable product where much can go wrong. Even with blockchain this trust aspect is a balance of uncertainty versus calculable risk. Powell *et al* conclude that rather than aiming for absolute truth with blockchain that the notion of 'common knowledge' is more realistic. Reading beyond the philosophical flavour of the Powell *et al* paper, it could be argued that there will always need to be an element of trust in meat exporting on that basis, the authors of this paper would proffer that a reputation for integrity in business will remain an important factor in the Australian meat industry's integrity proposition.

Members of the same study group as the Powell *et al* group at Queensland University of Technology also published a paper Cao *et al* (2021) that attempts to measure whether attaching short video messages to the blockchain QR code enhances the level of consumer trust in the blockchain for Australian beef marketed to Chinese consumers. In this paper, the authors attempted to validate a proposition that the desire to purchase blockchain-credentialed food products requires environmental stimuli to drive the purchase. They argued that video stimulation would have positive effects on perceptions of the blockchain veracity and purchase behaviours, particularly because in China, one-minute digital 'story telling' using filmed or animated messages is a commonly used marketing tool due to the widespread uptake of platforms like Tik Tok (referred to as Douyin in China). The Cao *et al* study quotes a paper by Fuzesi *et al* (2020) who found that a lack of education and promotion about the blockchain mechanics are real barriers to acceptance of the immutability of its traceability function.

The Cao et al *(ibid)* report is a confusion of findings that are blurred between academic theory and market research. The methodology is misguided as the authors are attempting to measure the impact of a video recorded marketing message in a quantitative survey rather than using qualitative research to explore the aspects of the video messaging that did and did not work and how the various cohorts differed in their response to it. Furthermore, this was done at an event sponsored by the affiliated blockchain business. Like any advertising message, obviously the creative execution has a lot to do with the success of the communication. One useful learning from the study was that trust in the beef blockchain dropped when consumers discovered that the Australian meat was processed and packaged in China.

As Chinese consumers become more sophisticated about food purchases, they want more than food safety and are seeking out the full provenance story behind the products they buy. However, due to a constant alertness for food fraud, Chinese consumers remain wary and ever sceptical of the information presented no matter what the format or medium. This innate scepticism presents a problem for use of blockchain alone to verify red meat purchases in China. Trust may need to be built through the marketing messaging and this would require a whole new level of marketing sophistication in the industry.

A domestic market study, Zhang and Jakku (2021) explored the food preferences of Australian consumers. What they term as 'preferred attributes' are essentially integrity factors which they break into endogenous factors (e.g. safety and freshness), being the practical or physical attributes; and exogenous factors (e.g. organic, GMO-free) being largely values-based attributes. This survey of urban Australians unsurprisingly revealed that there is a hierarchy of preferences and the endogenous factors like product safety are much more highly valued integrity factors. The only useful learning from this study for the meat industry is that marketers should not lose sight of the fact that product safety is a fundamental integrity factor in the minds of Australian consumers. The point that is missed in this research is that Australian consumers already assume that their food is safe and fresh and that there *are* premium market segments for whom the exogenous factors such as provenance, sustainability and zero carbon are worth paying a significant premium for, although these are considered niche market segments, they are becoming more mainstream.

Notably the domestic research on the subject of integrity factors in the Australian meat industry in recent years did not appear to explore the environment, global warming, zero carbon nor sustainability, yet these issues remained very high profile in the media in this period and marketing campaigns from activist groups have never been more vociferous on these integrity issues.

2.5 The global perspective

At a global level, many studies on integrity in food products seem to focus on food fraud, specifically in authenticating certification such as Halal or organic. Most recent studies discovered in this search did not offer new or relevant learnings for the meat industry as they are specific to other commodities. Blockchain is still viewed as the panacea for food fraud and traceability by many academics, however, in recent years the industry discourse on traceability has shifted from 'fraud' specifically to 'integrity' more generally. For this literature scan, studies were sought out that explored the more nuanced dimensions of the consumer experience with product integrity in food and the key findings of these are discussed here.

The shift in emphasis from the concept of 'traceability' to 'integrity' in the food industry was noted by one group of European researchers (Alrobaish, W. *et al*, 2021). These researchers undertook to develop a definition of integrity in food systems as well as a self-assessment tool to measure integrity. Because food fraud is deceptive by nature and therefore the committed perpetrators can continually find ways around traceability protocols (even blockchain), the concept of integrity is therefore increasingly important, and this paper argues that it speaks to a company's values rather than processes. The concept of integrity is shifting to extend beyond the physical aspects of ensuring safety in supply chains to consider the human element of integrity. The Alrobaish *et al* research quotes a study by Manning (2020) advocating the need for food companies to evolve from compliance-based organisations to ethically strong, making the point that HACCP systems are about hazard control, not about integrity. Alrobaish *et al* draw on the Manning Food integrity elements of 'Product Integrity, Process Integrity, People Integrity and Data Integrity' and using a meat industry case study, prove that there are essential components in an organisation required to deliver them: Leadership, Communication, Commitment, Risk Awareness and Resources.

Trust in integrity is amplified when there is a lack of certification to underpin an integrity claim. This is an issue that the McKINNA *et al* team identified with Australian red meat producers who are marketing their meat on the proposition of 'zero carbon' yet there is no means to verify this claim through certification or accreditation. A UK study by Bradford *et al* (2021) measures willingness to pay a premium for credence factors that cannot be realistically evaluated by consumers through certification. The Bradford *et al* study specifically explores pork products labelled 'raised without antibiotics' as the differentiator. Because credence claims are not always certifiable or accredited, this study uses the term *'the cost of ignorance'* because essentially, the consumer sets the price of what this peace-of-mind is worth. In the case of 'antibiotic free' labelling, consumer ignorance is driving the price premium for this pork in the UK because most consumers erroneously believed animal welfare was better without antibiotics. A government ban on antibiotic use for growth promotion was in fact in place during the study. While respondents in the research for this study expected to pay more for antibiotic-free bacon, the majority would not pay the premium. The study concludes that consumer perceptions have a significant impact on willingness to pay a premium independent of any certification or traceability verifying the authenticity of claims. Manning and Kowalska (2021) note that even certified organic food supply chains are easily corruptible on a very large scale because the consumer trust in the certification is so strong. Several global case studies cited in the study illustrate the large scale and highly organised nature of fraudulent organic claims on food packaging and in some instances, the regulators were complicit in the fraud.

As noted in the Kantar research, consumers look to retailers as the monitors of unsubstantiated integrity claims such as 'hormone free' and in the Australian domestic market there is certainly a halo effect emanating from the corporate marketing messages of the two major supermarkets who take such a strong moral stance in their advertising that it would imply that the integrity standards of every product they range is vetted. Another European study explores this concept of trust in retailers in detail - Garaus and Treiblmaier (2021) attempt to validate how blockchain traceability influences a consumer's choice of retailer, finding that retailers could indeed promote the use of blockchain to increase consumer trust. The Austrian study validates the notion that traceability decisions are not only made at a supplier brand level, but also at a retailer brand level and it found that promoting the use of blockchain was more potent than promoting retailer QA systems on the basis that higher levels of transparency equal higher levels of trust. Garaus and Treiblmaier also draw on prior research to note that it is both 'integrity' (i.e., does the retailer share the same values as the consumer?) and 'benevolence' (i.e., does the supermarket indicate that it has concerns for the consumer beyond profit motives?) that are the two factors that impact consumer trust in retailers. This trust is therefore more nuanced than just supply chain traceability. They quote several studies linking the blockchain base traceability systems with increased trust factors beyond just traceability of provenance. The study confirms that not only can retailers leverage a marketing benefit from using blockchain to respond to consumer fears of food fraud, but they can also extract operational benefits e.g., improved freshness and shelf management. However, for retailers to have any real marketing advantage, the blockchain systems need to go beyond the standard traceability required by law. The authors assert that it is the irrefutable dimension of the blockchain ledger compared to the supplying company's QA systems and promises that more positively influences consumer store choice.

A review of the financial media would indicate that the notion of product integrity is broadening to embrace ESG (environmental, social, governance) factors and corporate and social responsibility (CSR). Consumers around the world are increasingly considering the ESG/CSR credentials of brands in their purchase choices. Castro-Gonzales *et al* (2021) investigate the connection between consumers' perceptions of CSR and intention to purchase as well as the function of trust, credibility, and integrity for food producers. The study provides multiple sources linking CSR with improved competitive advantage and profitability, but it does not proport to advise how integrity can be validated. The study ignores the technology that is available to prove integrity and asserts that consumers are influenced more by perceptions than certifications. In the authors' view, trustworthiness depends purely on a consumer's capacity to believe. Highly visible CSR activity underpins the consumer capacity to trust a corporation. The study quotes several sources suggesting that consumers pick up multiple cues that enable them to form an opinion of a company's general CSR practises and ethos and that this positive perception does translate into purchase loyalty. They claim that ultimately, good CSR practise will increase the degree of trust in a company on all aspects of integrity. The authors do make the point that integrity is more about credibility than trustworthiness. Importantly, it is credibility that guarantees trustworthiness.

Castro-Gonzales *et al* (ibid) also note that a consumer's own value system moderates the degree of integrity expected from food companies (this point is important in an era where future generations are known to be more values-driven and socially aware). This Spanish consumer study reinforces the importance of both food retailers and producers needing to promote their triple bottom line corporate and social credentials (i.e., environment, social and economic credentials) to foster brand trust and build credibility, going to the extent of asking customers to co-create their CSR policies and programs. As noted in the study, the pandemic has thrown up several ethical dilemmas for food companies that may require modifications to CSR policy. Consumers in Europe are asking food companies to support society during the pandemic challenges in more ways than just providing food for those in need.

The 2021 Mintel report, *Future of foodservice* is a global study complied for MLA exploring foodservice transformations in response to the pandemic era and it clearly shows that integrity factors are not just about underpinning premium, luxury consumer brands. The foodservice sector has shown that a blurring of perceptions of 'premium' or 'fine dining' are occurring in foodservice - wagyu beef can credibly be prepared by a five-star chef from one of Australia's leading restaurants and delivered to the home in a paper carton. The Mintel report also explores the notion of 'trust' in foodservice indicating that this concept now transcends food safety to include care for employees, consumers and to act for community good. Several Australian restaurant chains and delivery services faced public shaming in recent years due to staff underpayment with strong community reaction indicating the importance of ethics in foodservice. COVID 19 has accelerated this consumer sentiment with the safety aspect now requiring reducing risk of both workers and customers to virus exposure. Like product brands, foodservice brands now also need to project values with which diners want to associate. The Mintel report quotes research that indicates that 52% of Australian adults say they are prepared to boycott companies who behave unethically. This was certainly the experience in the demise of George Columbaris' Melbourne restaurant group, which was shunned by even regular customers in response to staff underpayment.

2.6 Key outtakes from the literature scan

The research to date on the issue of product integrity as it can be applied to red meat (particularly the learnings from MLA projects), suggests that the understanding of the issue could be summarised as follows:

1. Ultimately, product integrity is about the trust that trade, retailers or consumers have that they will consistently receive the product that they expect and were promised. The product demanded varies depending on their needs, preferences, and value systems. The interpretation of integrity and the expectations of integrity platforms varies significantly between each of these cohorts as follows:

Cohort	Integrity expectation
Trade customers	Confidence that they will consistently receive the product they expect in full, on time and with due warning when there is a disruption to supply so that they can manage relationships with their own customers and supply chain partners.
Retail customers	Operational efficiency that enables them to manage stock levels, measure and record the cold chain integrity and shelf life and trust that the product is correctly labelled and meets the quality levels ordered at standards appropriate to consumer expectations.
Consumers	Assurances of product safety and quality (with a broad usage of the term 'quality' to include subliminal elements of integrity such as ethical and humane production, truth in labelling and being sourced from a clean environment).

2. Trust is transmitted down the red meat value chain from processors/exporters to traders/wholesalers, to retailers and ultimately through to the end consumers. Trust is largely conveyed through the brands of actors in the supply chain (retailer, restaurateur, wholesaler or producer) based on experiences and relationships.
3. Integrity also applies to exogenous factors (i.e. credence factors) that cannot be reasonably the judged by appearance.
4. Integrity is often subliminal rather than a 'top of mind' issue, i.e. a consumer's peace of mind about food safety largely comes from the knowledge that industry and government systems and processes are in place without needing to know the detail.
5. Significantly, food safety is important but not a purchase driver (except in third world countries), because of this reliance on government regulation.
6. Traceability is seen to relate to food safety rather than broader product integrity issues such as provenance.
7. Product integrity is notably not seen to be a differentiator for Australian red meat, yet Australia is the most trusted global supplier of red meat. Although Australia's integrity platforms are perceived as being good, they are not considered a differentiator nor a purchase driver, being perceived as no better or worse than competitor countries. Australian

red meat is trusted because of the country-of-origin associations (i.e. brand Australia) that suggests natural production methods in a clean environment.

8. There has been an apparent shift in the focus of the literature on integrity systems away from fraud to a broader more nuanced interpretation of concepts of product integrity to include Corporate and Social responsibility (CSR). An increasing cohort of consumers consider the ethical behaviours and values of brand owners in their purchase decisions.
9. Historically, the literature differentiated between quality and product integrity, yet this latest research suggests that these concepts are inextricably linked. Aspects that once were judged to be integrity attributes were about eating quality and the value proposition. The industry now interprets integrity as being about food safety and fraud. The key differentiator of Australian beef is taste which in turn is considered by consumers to stem from its 'clean and green' credentials, freedom from hormones and antibiotics and ethical and humane production methods, which in the consumer's interpretation, would be judged to be integrity factors.
10. Research now suggests that integrity in the food industry is more to do with the human factor rather than systems and processes and that the integrity performance of food businesses is judged by the culture of the organisation. The research suggests that the meat businesses should not just rely on compliance best practise but should place more emphasis on business ethics.
11. The contribution of blockchain and other IoT devices to product integrity is being questioned on the basis that, although they can assure the integrity of the data as it passes through the supply chain, they cannot guarantee the accuracy of the data that is loaded in the device by the supply chain actors. However, research with Spanish consumers concludes that the use of blockchain builds consumer trust by creating transparency and that it would benefit retailers more than processors.

3. Consultation findings

Industry consultation was undertaken to assess perceptions and the current mood on product integrity and capture the experiences of operators of businesses throughout the supply chain. A total of 53 professionals from the red meat industry, including producers, processors, quality assurance managers, advisors, marketers and other industry personnel were consulted with a mix of in-person and video format interviews. The following ten themes were drawn from the discussions that occurred in March and April 2022.

Theme 1: Product integrity is about building trust

The findings from the consultation in this project align with the assertion in the preceding market research study commissioned by MLA (Kantar, 2021), that ultimately, product integrity entails building trust. Trust was once primarily about building confidence that the food was safe to eat. Building trust in the current era requires brand owners to assure customers of a far broader spectrum of integrity factors.

The relative importance of the various integrity attributes varies widely by customer/consumer depending on the country, the market channel, the type of product, the shifting consumer values in that market and other considerations. The integrity attributes include, but are not limited to food safety, truth in labelling, consistency of quality/ trim, shelf life, provenance, how it was produced, reliability of supply, corporate values, and trustworthiness of the marketer as a trading partner. Essentially, product integrity elements fall into two distinct categories - intrinsic and extrinsic.

Intrinsic elements of integrity

Intrinsic elements are those that are inherent to the product and are generally viewed to be essential. The intrinsic elements fall into four basic sets:

1. Food safety i.e. can I trust the hygiene from this source?
2. Nutrition i.e. does it meet my special dietary requirements?
3. Truth in labelling, i.e. is it the product that it purports to be? Are the integrity claims such as 'organic' or 'Halal' truthful?
4. Fitness for purpose, i.e. is the product acceptable for its intended use?

Extrinsic elements of integrity

Extrinsic elements are largely values-based judgements mostly related to the story behind the product i.e. where and how the product was produced. This includes but is not limited to:

1. Animal welfare and how the animal was treated during production
2. Freedom from growth promotants and hormones
3. Environmental sustainability including carbon footprint
4. Provenance
5. Business ethics i.e. workplace practices, behaviour as a corporate citizen, etc.

For trade customers, reliability, and trustworthiness as a trading partner are also relevant.

Despite advances in product integrity systems, emerging technology devices and the proliferation of accreditation programs, essentially, trust is still necessary to believe the claims of both intrinsic and extrinsic integrity factors because consumers have no way of knowing the veracity of these claims and most do not have the capacity to assess the meat visually, although some may believe that they do.

Theme 2: Increasingly trust lies with the meat marketer's brand

When the customer or consumer has a high level of confidence that a product they purchased meets their expectations of what was promised, they build trust in the brand, be it Brand Australia, the distributor/retailer brand or the marketer's brand. This trust in a brand is what drives repeat purchases.

Since the Australian red meat industry has transitioned from commodity trading to trading differentiated products with wholesale and retail brands, trust is gradually shifting to the point that it increasingly lies with the meat marketer's brand, whereas it once resided with the retailer or foodservice provider to assure it was safe meat from Australia. Consumers still rely heavily on retailer brands as their source of trust in the intrinsic factors (i.e. food safety) but awareness of proprietary meat brands is increasing as they seek out more extrinsic attributes of integrity.

Most red meat brand owners feel that there is little incentive for them to invest in technologies to enhance the intrinsic elements of their integrity systems as a means of differentiating their brands because the government and industry systems more than satisfy customer and consumer expectations. A number of processors had invested in enhanced intrinsic integrity factor around improved traceability and confirmed that customers were not willing to pay more for these. There was little in the way of incremental value that could be extracted from the intrinsic attributes as they are already presumed to be best practise and enhancements are not usually sufficient to cover the additional cost. However, by enhancing the extrinsic attributes of integrity they are strengthening their competitive position. Most still underpin and validate claims of intrinsic integrity by indicating their use of accreditation schemes with third party audits, but such independent accreditation now also exists for extrinsic factors.

Theme 3: The lines between quality and integrity are blurring

Meat marketers are now leveraging various combinations of product quality and product integrity factors to differentiate their premium brands. Most are enhancing their premium brand value propositions by promoting extrinsic integrity attributes through the story behind the product, e.g. where the meat comes from, how it was produced, the credentials and history of the business producing it, as well as the values and ethics of the business marketing the product. In consumer messaging, 'quality' is even being expressed as a function of provenance and animal care. In beef, there is something of a paradox at play with quality being expressed as both a function of the number of days on grain by some producers or the fact that it is grass-fed by others.

While the eating experience (i.e. quality) is still key to the brand promise at all price points, modern processing techniques and MSA (Meat Standards Australia) grading have improved eating quality across the entire industry and all processors are technically able to achieve higher standards of eating quality, therefore, this factor is reducing as a differentiating factor between proprietary brands. While MSA grading is widely used, many processors do not profile its use as a selling feature to consumers in export markets. The view is that MSA branding provides a guarantee of a minimum eating quality, which their brands exceed by a large margin. Also, MSA is not thought to be well known by consumers in domestic or export markets.

Based on the above factors, extrinsic integrity factors are elevating in importance over messaging about eating quality, to the point where extrinsic attributes are now also overshadowing eating quality as purchase drivers for premium meats (less so for lower value, commodity meat). Because intrinsic integrity factors like food safety or 'truth in labelling' are now largely assumed and taken for granted, customers and consumers are basing their brand choice around extrinsic factors that align with their own personal value judgements, for example, organic or HGP-free are mandatory pre-requisites for purchase for some consumers, no matter what the eating quality.

Theme 4: Technical integrity is still critical for commodity meat

Although arguably the meat marketers' brands are becoming the main source of trust for premium products, intrinsic elements of integrity including on-farm quality assurance programs, food safety and compliance with hazard control specifications, are still critically important for commodity products such as manufacturing meat in some market segments. In emerging markets, consumers are still price driven and branding carries little weight, so there is a strong reliance on industry and government integrity platforms as a source of confidence. Many exporters believe that Australian red meat even achieves a premium in low value markets, particularly with food safety conscious customers such as QSR (quick service restaurant) chains, because of their confidence in Australian integrity systems throughout the entire supply chain. It was reported in the interviews that patty makers in the USA acknowledge that Australian grinding beef is consistently of a higher hygiene standard than their local American beef.

Traceability is of utmost importance with commodity meat and for high-volume purchasers in developed markets who require swift (within hours), paperless traceability systems and insist that these are frequently stress tested as part of the audit process. Buyers of lower value meat in more price-sensitive markets will accept the Australian industry standards of traceability back to the batch, provided it is supported by evidence of industry accreditation.

Theme 5: The 'Brand Australia' factor is critical but subliminal in export markets

'Brand Australia' has underpinned the successful development of Australian propriety meat brands in export markets because it provides the foundation of customer and consumer confidence in red meat integrity. Exporters note that this has occurred in the years since BSE and FMD outbreaks impacted competitor countries. These incidents gave the Australian industry a spotlight on the world stage to showcase our integrity credentials. However, most exporters confirmed that even though the perceptions of superior product integrity conveyed by Brand Australia brand are still important, this factor is now assumed, so therefore, its influence as a marketing tool is less differentiating. Brand Australia is becoming more subliminal and functioning as an endorsement brand.

Exporters consulted confirmed the finding from the Kantar research (2021) that the world-leading integrity of Australian red meat is no longer a top-of-mind issue driving the purchase decision. The brand owners interviewed universally concurred that the 'Product of Australia' label on the carton or pack provides a foundation for confidence in their brands and is a contributing factor to their ability to achieve a significant premium over and above competing export countries. Likewise, the 'True Aussie' brand and point of sale material was highly valued as an endorsing mark by most of the exporters interviewed.

The exporters consulted emphasised that it is critically important that the Australian red meat industry maintains its vigilance and leadership position on product integrity because if there was ever a major breech in Australian integrity systems (such as a food safety or mislabelling incident), it would do irreparable damage to both Brand Australia and in turn to the exporters' brands. Their opinion is that their ability to achieve a premium would be damaged and it would take many years to rebuild Australia's reputation. The historic horse meat substitution scandal of the 1980s is still a cloud hanging over the Australian red meat industry many years after it occurred (see PP no. 222 of 1982, nla.gov.au).

The industry sees the protection of the integrity systems that make up the foundations of Australia's red meat industry as the most critical role of MLA and the promotion of its benefits through programs like True Aussie as being secondary in importance.

It appears that there is still work to be done in some parts of the world in building awareness of Australia's leadership in product integrity. Exporters servicing customers in the frontier markets of emerging economies, noted that awareness of Australia's reputation as a leader in product integrity systems relative to competitors like the USA is not as well known.

Theme 6: Australia's competitive advantage is underpinned by 6 different integrity factors

Exporters strongly support the proposition that the 'Brand Australia' factor provides them with a significant competitive advantage and price premiums in most markets most of the time. They indicated that the 'Brand Australia' value proposition is underpinned by the following integrity factors, both intrinsic and extrinsic:

1. **Quality**

Australia has a reputation for producing consistently high-quality red meat and is known for its cut accuracy and consistency of trim. Australia is seen to be a leader in Wagyu, and pure bred black angus beef, grass fed beef and is second only to New Zealand in lamb.

2. **Agility**

By comparison with its main competitors who are known for producing long runs of homogenous cuts, Australia is seen to be an agile, niche marketer capable of responding to requests for customised cuts in shorter runs. The Australian Meat Handbook with its many cut configurations is seen to position Australia as the defining voice on meat cuts, being commonly used by global customers as a buying guide.

3. **Extended shelf life**

The strong consensus of exporters is that Australia's standout point of competitive advantage is extended shelf life, which is due to the cleaner processing and slower chain speeds that obviate the need for acid or ammonia carcase washdowns. The extended shelf-life factor greatly reduces the risk to importers and distributors, improves inventory control for retailers and provides the ability to age for longer or while in transit.

4. **Traceability**

Although Australia's ability to trace production back to the time of packing and group of carcases being processed is a standout feature (enabled by the carton label data which, if necessary, can be linked to NLIS tags controlled by AUS-MEAT), its potency as a point of competitive advantage is limited because traceability is generally of minimal interest to customers until there is an incident.

5. **The natural, unpolluted environment**

Exporters believe that the perceptions around appealing imagery of grazing in Australia (wide open spaces, clean air, more humane range feeding in natural pastures) provides a competitive advantage, but processors believe that this is waning. Australia's high profile as a producer of quality grass-fed beef and lamb produced under natural grazing systems is seen to produce a healthy product in a humane way contributes to this positive perception. Some exporters believe that there is a danger that this perception is being eroded as the proportion of grain-fed beef exports grow, while others believe that MLA's promotion of the grass-fed point of difference is detrimental to their brands. Furthermore, some feel that Australia's track record on environmental issues has been tarnished by coal exports, the demise of the Great Barrier Reef and the government's general approach to climate change. The global coverage of the catastrophic bushfires and floods of recent years have also dented Australia's environmental credentials.

6. Ethical and fair trade

Generally, Australians are viewed as being trustworthy trading partners who are true to their word and operate in a robust legal system with checks and balances.

A common view is that competing countries, particularly South American suppliers, are rapidly catching up to Australia in such credence factors as well as in eating quality, and that it is critical that the Australian industry continues to invest to push the boundaries of its integrity systems into more extrinsic factors. Australia has a considerably higher cost structure, so exporters need to achieve a significant marketing edge to deliver the premium required to be profitable and cannot afford to let this product quality and integrity advantage be eroded.

Exporters also note that the extrinsic aspects of integrity are of growing in importance for the Australian red meat industry precisely because of the nation's niche market positioning. Australia is a small player in volume terms in the global meat market and the significantly higher production cost means that there is a need to premiumise the offer beyond commodity competitors like the USA.

Theme 7: Industry does not see the need to invest in enhanced intrinsic integrity systems

Processors rely on the existing government and industry frameworks for the technical or intrinsic elements of product integrity and generally find them to be adequate (albeit with some shortcomings as discussed below). The combination of the NLIS tagging systems, AUS-MEAT audits, government inspections and the paper trail that goes with them, provides what is seen to be a 'world's best' intrinsic integrity system. Importantly, all exporters interviewed reported that the Australian industry standards were rarely questioned by their customers and accepted in most markets and by customers in all channels. There is little incentive for processors to invest beyond these established systems given that customers are generally not asking for anything more and would not be willing to pay even a small premium for enhanced intrinsic integrity.

To varying degrees, a number of the exporters interviewed had at some point in time, investigated investment in technologies to improve intrinsic product integrity (particularly traceability) in an effort to enhance their competitive advantage. A few processors have invested in systems for tracing the primal back to carcases in the boning room and forward to the consumer with retail QR codes. Most had looked at blockchain with some going to the point of trialling it. The experience of those companies who had trialled it is that there was minimal incremental benefit from providing this additional layer of traceability. In all cases, this enhanced integrity involved major investments and added significantly to operating cost and complexity. In the case of those with consumer QR codes, the rate of consumer scans was disappointingly low. Blockchain and associated technologies were not valued by their customers to the point that they could demand any price premiums. Those interviewed believe that the folklore around people wanting to know where their food comes is not widespread, as the offer of further information on the QR code did not convert to a scanning action by customers or consumers when given the opportunity and QR codes have been widely used for many years now. However, the other benefits that blockchain could offer their business besides traceability such as improved inventory management, supply chain efficiency, enhanced customer collaboration and marketing opportunities did not appear to be well understood by industry. Very few of the businesses interviewed were doing more than linking the QR code to their website home page and providing general company information. Potentially, there is a lost marketing opportunity here in that it provides a vehicle to directly connect with consumers and to assist them to have the best possible eating experience through preparation and tips as well as seasonal recipes.

Most of the mainstream processors indicated that they had abandoned plans for investment in enhanced intrinsic integrity because they could not see how they could leverage this for improved returns or competitive advantage. With record cattle and sheep prices at the time of interviewing, exporter margins were being squeezed. They noted that Australian red meat is already the most expensive in the world and as such, buyers cannot absorb any further price premium. Any incremental cost increase needs to be passed on to the consumer, which is not feasible in the current environment of high meat prices and recovery of the foodservice sector post-COVID 19.

Theme 8: The NVD is considered the pivot point in the Australian integrity system

There was universal concern expressed in the interviews from marketers, retailers, processors and foodservice providers about the major shortcomings of the National Vendor Declaration (NVD) process. The NVD is seen as the pivot point on which Australian red meat traceability is balanced and a vulnerable risk point in the supply chain. The issue is industry awareness about the high level of non-compliance on completing the NVD form correctly. Incomplete forms and inaccuracies are said to be common and many note that this vital instrument is not adequately enforced. The current shortcomings are due to a combination of human error, ignorance, tardiness, and in some cases, outright deceit. It is thought that many producers do not fully understand the importance of the NVD and the risk to the industry should a residue or disease incident come to light. Although the problem is largely claimed to be at the producer level, customers believe that in some cases, there is also inadequate checking at the processor's premises. Processors report that they need to employ one or more additional staff to cross-check and rectify shortcomings in NVD paperwork, which adds another layer of cost. One processor has gone to the point of only paying quality bonuses when the NVD being submitted was 100% accurate. A major retailer has invested in their own electronic version of the NVD and implemented this with their suppliers to attempt to rectify this issue and capture the data.

A far more concerning issue than the cost of non-compliance is that a failure at this point of the integrity system exposes the industry to great risk, particularly loss of market access due to chemical residue or undetected disease. Commonly, processors need to palpate every animal to double check that there has been no application of hormones, which again adds unnecessarily cost and compromises hygiene. A loss of market access would be catastrophic and as such, many feel that this weakness in the system exposes the entire industry to unacceptable risk.

The major source of frustration for those beyond the farm gate in the supply chain is that this vital step is not seen to be enforced, whereas they feel that every other link in the supply chain is rigorously scrutinised and independently audited. In fact, Livestock Production Assurance, which is a prerequisite for access to NVDs is audited through the LPA Integrity Systems. Annually, 2,000 random audits are completed each year on LPA accredited producers and around 1,000 targeted audits are undertaken for identified non-compliance. NRS also completes around 2,000 audits. Processors appear unaware of the extent of monitoring and assume that penalties for non-compliance are absent. Although technically the NVD is a compulsory, statutory document, the processor and retailer experience and perception is that it is rarely enforced, nor offenders penalised.

Theme 9: There is a need for a 'super data exchange' specific to the meat industry

Processors and feed lotters are frustrated at the heavy administrative burden that compliance documentation entails. The compliance demanded by government, industry and customers largely falls onto processors and feed lotters with a vast amount of paperwork and audits involved. In many instances there is a duplication of effort that is unnecessary in the digital era. For example, a processor must complete four separate pieces of paperwork on receival of an animal and most processors have multiple audits covering virtually the same elements. Although there is a strong understanding of the need for compliance, it adds considerable cost and another impost to Australia's lack of global price competitiveness. It is believed that much of this bureaucracy could be avoided and data errors reduced with more efficient electronic systems and processes and an industry-wide information portal to distribute the documentation with appropriate access permissions.

The source of the problem is the paper-based system and the lack of connectivity of the numerous integrity systems that exist. There are various programs in place covering discrete parts of the supply chain, but they are not connected. Harmonisation of many of these programs and standardisation of the data management protocols is called for. Even within the industry, there are elements of integrity that sit within multiple industry bodies including MLA, ISC, AMIC, ALFA and others. The feeling by many is that, in this current era of digitisation, it should be possible to have a more, connected, seamless agile and efficient program that sits across the entire supply chain and which could enable centralised management and monitoring.

The proliferation of certifications on extrinsic factors has extended beyond a comprehensible number. While organic or Halal were once the only additional marks of enhanced extrinsic integrity in use, there are now many integrity programs covering a wide range of issues and cartons are increasingly containing a confusion of logos. It was suggested that an Australian meat industry standard measure for many of these extrinsic factors would be easier for customers to comprehend e.g. a colour coded check mark for each extrinsic integrity factor that is audited.

As well as harmonisation of accreditation programs and organisations, there is a desperate need for a 'whole of supply chain' harmonisation of data systems to reduce the administrative burden and cost and eliminate human error. A number suggested that the industry should develop a blockchain style, secure data portal where authorised parties can access the specified data through appropriate permissions to meet their compliance requirements. This blockchain could include every piece of data applicable to the meat product as it progressed through the supply chain from the NVD through to details of enhanced integrity such as zero carbon and meat messaging information.

None of the interviewees in this study were aware of the proposed 'whole of agriculture' system, the Australian Agrifood Data Exchange which is in the process of being workshopped by a number of industry bodies. When such a concept was discussed in some of the interviews, it was enthusiastically endorsed but most felt that a system specific to the meat industry would be a more urgent priority than a national system which could take many years to build. The compliance certification experiment conducted in the sheep industry for the Australian Data Exchange project is exactly the type of program sought after to avoid duplication of effort, but this could go further than farm gate and include a function to harmonise retailer QA systems globally and record enhanced integrity systems such as 'never ever' or 'zero carbon'.

Theme 10: Talking about sustainability just won't cut the carbon

There is a common view shared by all exporters that sustainability and the broader ESG agenda will become the next frontier of product integrity. Recent global events have led to some in the media to argue for a 'D' for democracy to also be added, indicating that it will be a future integrity criterion called for to participate in global trade.

All interviewees reported that the customer and consumer conversations about environmental sustainability are becoming more frequent, intense, and pointed. Most believe that it is inevitable suppliers will require evidence of meeting agreed carbon reduction goals within five years. In anticipation, the business operators interviewed are already well-advanced in developing programs to reduce the carbon footprint such as renewable energy, feed supplements, carbon capture, land remediation and tree planting on farms, more environmentally friendly packaging and waste reduction. There was concern expressed by some that the industry has set a carbon neutral target of 2030 without a clear plan or a 'whole of supply chain' consensus as to how industry will achieve this. It was noted that on-farm projects alone will not be sufficient. Processors feel that they are already well ahead of MLA in implementing responses to carbon reduction.

Although environmental sustainability is clearly a priority in the meat businesses participating in this study, there are also intensifying conversations taking place around the broader ESG agenda including modern slavery, ethics, workplace safety and more. Many of these elements are already included in the scope of customer audits, but importantly, the meat businesses are lifting the visibility of their efforts on corporate and social responsibility, developing policies that are in public view and aligning CSR efforts more strongly to their brand messaging.

4. Insights from the research to date

What we have learnt about product integrity from both the consultation and literature scan research is discussed here.

Key learning 1: Product integrity is an evolving and nebulous concept

During the consultation, brand owners conveyed a sense that product integrity is a dynamic space and that the relative importance of the various factors is shifting as contemporary consumer values change. This was also evident in the scan of recent literature. Brand owners report that product integrity has moved significantly in recent years, the most profound shift in emphasis being the focus on extrinsic integrity factors particularly with the more affluent consumers. This shift is largely because of the entrenched belief that the intrinsic factors for Australian product (e.g. food safety) are assured and assumed.

Several respondents made the observation that COVID 19 has been the catalyst for a shift in consumer values and purchase behaviours, manifesting in less emphasis on materialism and more on social consciousness.

The research also suggests that the relative importance of the various integrity attributes is also becoming more varied. Customer/consumer preferences in relation to integrity vary depending on the country, the market channel, the type of product, the shifting consumer values in that market and other considerations. The attributes of product integrity are clearly a matter of personal value judgements and vary depending on personal factors such as cultural beliefs and health requirements. Furthermore, there is a hierarchy of factors that influence purchase which notionally include 'essential', 'very important', 'nice to have' and 'not relevant'. While this hierarchy is based on personal value judgements, essential attributes such as food safety and truth in labelling are common to all.

The relative importance of product integrity factors varies with each purchase. Market research conducted over the years by various parties, including McKINNA *et al,* consistently shows that consumer product choice in red meat is driven by four key factors:

1. Quality
2. Price
3. Freshness
4. Convenience.

The relative importance on these four factors varies depending on the product cut, intended usage and customer demographics/socioeconomics. By way of example, Australian consumers would rarely question the provenance of minced meat for a weekday meal for the family, but they may care more about this for a dinner party roast.

Key learning 2: Brands have taken over from government and industry technical compliance as a source of trust

Historically, red meat was a traded commodity where product transacted from business to business (mostly in carton form) and largely driven by price. Corporate brands notionally started to exist when the industry changed to selling primals which had little more than the seller's name on the carton, so the brand value was based on the seller's reputation. Development of consumer brands was difficult because of the large amount of quality variation in the product, making it difficult to guarantee a consistently good eating experience (a critical factor in building consumer confidence in brands). In these times customers and consumers where heavily reliant on government compliance platforms to assure product integrity and these were based on the intrinsic elements, particularly food safety and truth in labelling.

This situation began to change in the late 1980s driven by step changes in meat science including electro-stimulation, more sophisticated grading technologies such as pH measurement and probe technologies. It culminated in the introduction of MSA grading. Collectively, these advances have given meat marketers the confidence to invest in building their brands to the point where most premium cuts are now marketed under proprietary brands. Furthermore, product is increasingly being sold directly to end customers, such as supermarkets and foodservice customers, rather than through intermediaries.

This transition from trading commodities to trading differentiated products has resulted in trust in the integrity that is predominantly being conveyed through brands. As the Kantar (2021) report found, trust and confidence are conveyed down the supply chain through brands. Customers gain comfort from trust in the suppliers' brands. Consumer trust comes from the retailer and foodservice brands in the first instance.

The role of government and industry in assuring technical product integrity has now been relegated to a secondary, subliminal position, even though it is most certainly a critical underpinning role. Both the literature scan and the consultation suggest that customers and consumers gain peace of mind from the knowledge that these platforms exist, without needing to know the details.

This dynamic means that the intrinsic integrity factors such food safety, confidence in the truth of the labelling and meeting requirements for nutritional or religious beliefs are still necessary conditions of purchase but are no longer a differentiator between brands. Therefore, logically the extrinsic attributes of product integrity are becoming more important in brand choice.

Key learning 3: Brand Australia has provided the scaffolding for exporters to build proprietary brands

Although proprietary brands have now become the predominant source of customer and consumer trust, the importance of the 'Brand Australia' should not be understated. 'Brand Australia 'does the heavy lifting in terms of building customer confidence in the intrinsic factors of product integrity (i.e. food safety, truth in labelling, freedom from disease and harmful chemical residues and being nutritionally wholesome because it is produced in a clean environment). This has enabled the development of a portfolio of strong Australian propriety meat brands by providing the foundation for fundamental confidence in Australian red meat integrity.

Key learning 4: Australia's early investment in product integrity has paid off

The high level of trust in the integrity of Australia red meat is because of the large investment made by the industry in the key product integrity platforms including:

NLIS - which provides lifetime traceability of the animal.

NVD - which provides evidence that on-farm protocols have been followed.

AUSMEAT processing plant audits and the AUSMEAT language - which give a high level of confidence in truth of labelling and the rigour of the integrity claims.

MSA - which provides assurance of the minimum eating quality.

Collectively these platforms provide independently verified sources of truth to support Australia's claims and which export customer trust in Australian red meat. The platforms are transparent and comprehensible if importers seek to understand the detail.

Key learning 5: Brand differentiation is now only possible through extrinsic factors

As previously highlighted, most of the brand building activity by premium red meat marketers is built on extrinsic integrity factors, leveraging the opportunity presented by shifting consumer values. Extrinsic integrity factors that enable this differentiation include environmental sustainability, provenance, feeding regimes and treatments, animal welfare, business profiles. Processors believe that the lack of agreed metrics and measurement tools on environmental sustainability is a barrier to driving this harder as an extrinsic integrity factor.

Provenance

Provenance is now commonly used as a brand differentiator, particularly for grass-fed beef and prime lamb. Provenance-based branding involves story telling about where, how and by whom the product was produced. The provenance story is usually used as an explanation of the unique flavour and eating quality of the meat in a similar manner that wine makers use terroir, which encompasses all the factors that go into producing wine grapes in a vineyard, from the climate to the soil type, to the elevation. A number of the Tasmanian beef and lamb brands talk about producing their product in the cleanest air in the world, alongside pristine coastlines with natural grazing methods. Many red meat brands capitalise on global perceptions about Australia's wide open spaces where animals roam freely. This projects a sense of the product being natural, wholesome and humane. Some producers leverage their provenance story around the fact that their family businesses have generational expertise and are committed to producing high quality red meat in a natural and humane manner applying genetics and agribusiness skills that go back many years.

Feeding regimes and treatments

Nutritional programs and the absence of growth promotants, antibiotics or GMOs are promoted as a feature of many premium red meat brands, although generally as a secondary element of their brand value proposition. Natural pasture is considered to be an important selling feature for grass-fed brands and attention to detail with feed rations for grain-fed brands. Freedom from chemicals is important for products sold into markets like the USA where this factor is more highly valued. A number of processors strongly promote involvement in accredited programs that are third-party audited to verify the claims being made. This programs usually incur a licensing fee and additional auditing costs, which are offset by the price premium.

Animal welfare

There is a common view among brand owners that consumer concern about animal welfare is growing despite very high industry standards. Animal welfare is usually a secondary selling feature rather the centrepiece of the brand value proposition. Some believe that over emphasising animal welfare could be a double-edged sword by raising awareness of the issue that animals are slaughtered. Several brands have third party accreditation in welfare that goes beyond the industry standard such as: 'American Humane Certified', a not-for-profit scheme based in the USA. This protocol is based around the 'five freedoms of animal welfare' which is used in a number of accreditation programs and includes:

1. Freedom from hunger and thirst
2. Freedom from discomfort
3. Freedom from pain, injury or disease

4. Freedom to express normal behaviour
5. Freedom from fear and distress.

Key learning 6: The next frontier of product integrity is ESG

There is a common view shared by all exporters that sustainability and the broader ESG agenda also referred to as Corporate and Social Responsibility (CSR), will become the next frontier of product integrity. ESG covers a broad social and ethical agenda including environmental sustainability modern slavery, fair trade, diversity, workplace safety, food waste and social good such as eradicating hunger and much more. Financiers and investors regard the ESG agenda as a mandatory aspect of business governance. For example, some of the banks have introduced policies against financing polluting industries such as coal and stockbrokers around the world are marking down listed companies that have poor ESG credentials.

Society is raising expectations on corporate behaviours, expecting greater transparency and accountability. Increasingly, the ESG credentials of a business are becoming an important factor in being an employer of choice. Social media in now aggressively calling out businesses that are not seen to be good corporate citizens.

The impact of ESG is being felt well beyond the share market. Retailers report that this is now starting to influence purchase behaviours and brand choice, particularly with younger consumers. As a result, Australian supermarkets are very publicly promoting their ESG credentials and setting ambitious targets on waste, carbon reduction and addressing social issues such as national dietary improvements and hunger. There is an expectation that these high corporate standards will be imposed upon suppliers with even more auditing required. The major retail and foodservice customers interviewed as part of this study indicated that they would work with their suppliers on ESG reforms rather than forcing this upon them abruptly.

There is an expectation that ESG integrity factors will increasingly impact the meat industry in particular, based on the perception that sheep and cattle produce a very high carbon footprint. Exporters report that their customers are progressively initiating more pointed conversations about ESG policies and they feel that it is inevitable that in the next year or two, specific elements of ESG will be introduced into supply agreements with increased audit trails. Exporters believe that this will start with carbon neutrality, which is why many are well advanced on carbon reduction activity. Some of the QSR corporations are believed to have already introduced bans on Brazilian beef because of concerns about deforestation, which is also an issue in parts of Australia.

Recognising the growing consciousness around ESG, meat industry businesses are lifting the visibility of their efforts on CSR by developing policies that are in public view and aligning CSR efforts more strongly to their brand messaging (as illustrated in the case studies for this project).

Modern slavery

One aspect of ESG that deserves to be called out is modern slavery which has direct relevance to the meat industry. This issue was first raised in the context of the textile industry in developing countries and has now gained momentum in Australian agriculture due to high profile incidences of under payment and poor treatment of visa labour, notably mostly in horticulture. The two major supermarkets have become hypersensitive about this issue being caught up in underpayment of casual labour. Meat processors are likely to come under increased scrutiny on this issue because of the extensive employment of contract labour.

Key learning 7: The lines between quality and integrity are blurring

Historically there was a distinct separation between 'quality' and 'integrity' with the former being about eating enjoyment and the latter being about peace of mind. However, the line between quality and integrity in red meat is blurring.

Until recent years, the centrepiece of a brand value proposition for premium meat was a highly satisfying eating experience. However, there is a growing tendency for brand owners to capitalise on the emotions of their affluent consumers by broadening the notion of quality and taste. Taste is now claimed to be a function of extrinsic integrity attributes such as provenance and marketers are working this into their brand value proposition. The inference in the messaging is that their products deliver a highly satisfying experience because of where the meat comes from, how it was produced, the family behind the brand and their approach, as well as the values and ethics of the business marketing the product. The promotion of these extrinsic factors is tapping into the emotional needs of affluent consumers and their desire for an holistic experience that offers, not only an enjoyable eating experience, but enables them to feel good about their purchase based on the story behind the product.

In consumer messaging, 'quality' is even being expressed as a function of feed and animal care. This approach also enhances consumer satisfaction by providing peace of mind that product is GMO free, produced in a natural, sustainable way, the animal was treated humanely and that it is free of harmful chemicals. All meat sold in Coles supermarkets is now HGP free and the retailer has just launched a zero carbon premium beef brand.

MSA

Technically MSA is an integrity rather than a quality factor as its intention is not to measure quality but rather provide consumer confidence in the consistency of the eating experience. Although MSA grading is close to universal for premium branded products, many processors do not use MSA as a selling feature. The view is that MSA branding provides a guarantee of a minimum eating quality, which their brands exceed by a large margin. Also, MSA is not well known by consumers in export markets. While the eating experience (i.e. quality) is still key to the brand promise, modern processing techniques and MSA grading have improved this across the industry and all processors are technically able to achieve higher standards of eating quality, so it is no longer a differentiating factor. Furthermore, for the MSA brand to be used at a consumer level requires the retail outlets to MSA accredited which is not practical in export markets.

Key learning 8 : Technical integrity is still relevant for low value meat

Although, arguably the meat marketer's brands are becoming the main source of trust for premium products, intrinsic elements of integrity including on-farm quality assurance programs, food safety and compliance with hazard control specifications, are still critically important for commodity products such as manufacturing meat in some market segments. In emerging markets, consumers are still price-driven and branding carries little weight, so there is a strong reliance on industry and government integrity platforms as a source of confidence. Many exporters believe that Australian red meat even achieves a premium in low value markets, particularly with food safety conscious customers such as QSR chains, because of their confidence in Australian integrity systems throughout the entire supply chain. It was reported in the interviews that patty makers in the USA acknowledge that Australian grinding beef is consistently of a higher hygiene standard than their local American beef.

High-volume purchasers of low value commodity meat in developed markets will pay a premium because they require swift (within hours), paperless traceability systems and insist that these are frequently stress tested as part of the audit process. Therefore, they need to purchase from processors with sophisticated traceability capability, giving Australian suppliers an edge. Buyers of lower value meat in developing markets will accept the Australian industry standards of traceability back to the batch, provided it is supported by evidence of mandatory accreditation.

Key learning 9: Australia must retain leadership in product integrity

A view commonly held in the industry is that competing countries, particularly South American suppliers, are rapidly catching up to Australia on integrity standards as well as in eating quality. It is critical that the Australian industry continues to invest to push the boundaries of its integrity systems to lift the bar higher on intrinsic factors and wider on extrinsic integrity factors. Because of Australia's considerably higher cost structure, exporters need to achieve a significant marketing edge over global competitors to deliver the premium required to be profitable and cannot afford to let this product quality and integrity edge be eroded.

Exporters note that the extrinsic aspects of integrity are of growing importance for the Australian red meat industry because of the nation's niche market positioning. Australia is a small player in volume terms in the global meat market and the significantly higher production cost means that there is a need to premiumise the offer beyond competitors.

Exporters emphasised that it is critically important that the Australian industry maintains its vigilance and leadership position on product integrity because if there was ever a major breech in Australian integrity systems (such as food safety or mislabelling incident), it would do irreparable damage to both Brand Australia and in turn to the exporters' brands. Their opinion is that their ability to achieve a premium would be damaged and it would take many years to rebuild Australia's reputation. The historic horse meat substitution scandal of the 1980s is still a cloud hanging over the Australian red meat industry many years after it occurred (see PP no. 222 of 1982, nla.gov.au).

5. Case study learnings

Case study 1: Stockyard premium, grain-fed beef

1.1 About this case study

This case study has been selected because of Stockyard Beef's involvement in a research trial (supported with MLA funding), which tested a consumer-facing blockchain with traceability and real time cold chain tracking. The commissioning of this research project and others indicates that there is much interest in blockchain and associated IoT technologies, particularly from premium brand owners. Most of the premium beef marketers interviewed in the broader study indicated that they had at some point considered, and to various degrees, investigated how blockchain could add value and a few had been approached by retail customers about exploring this opportunity further.

Stockyard Beef has successfully implemented a full blockchain trial as part of their industry research project in collaboration with a Singaporean retailer. Their experience, highlighted in this case study, illustrates that these systems can be difficult to implement and extract value from, relative to the considerable cost and time involved in their implementation. In this case, the operating environment at the time of this trial added further obstacles and complexity. Conducting this research project during the pandemic meant that meetings to discuss the detail of the technology were not able to be held in-person and the supply conditions were very challenging due to freight disruption. At the same time, the worst floods in 100 years, created unforeseen supply and logistics problems.

The product:	Super-premium, branded, grain fed Wagyu and Angus
The markets:	85+% exports, North Asia, Southeast Asia, and Middle East
The customers:	High end foodservice and gourmet meat retailers
The supply chain:	The company breeds and backgrounds cattle at their own properties and purchases cattle from third party backgrounders to finish on the company-owned feedlot. Cattle are service killed and sold to importers, distributors and direct to retailers.
Enhanced product integrity systems:	Stockyard Beef supports its claims of leadership in animal welfare, HGP-free, GMO-free, and environmental management with a suite of third-party accredited schemes. All beef is MSA graded. Stockyard Beef is trialing a blockchain verified supply chain enabling engagement through to consumers in Singapore.

Key outtakes:	Development of a blockchain integrity system is acknowledged as a costly and slow process but ultimately, benefits can be multiple. The stress points in the data integrity are the NVD forms and the inability to trace primal cuts back to carcases and farms in the boning room. While blockchain does entail practise change from the retailer, the retailer has most to gain in terms of brand protection. The benefit to the exporter is improved B2C insights and the ability to target marketing messages.

1.2 Company profile

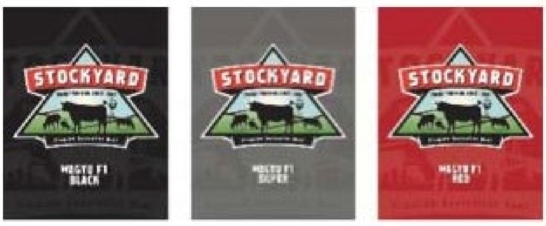
Stockyard Beef is an integrated breeder, producer, feeder, and marketer of long-fed, grain-fed Wagyu and Angus beef. The company was established by the Hart Family at its Kerwee property located in the Southern Darling Downs in Queensland. This region is ideal for production of premium cattle given its rich soils, stable weather and access to clean water from the Great Artesian Basin. The property surrounding the feedlot supports the grazing of the company's stud breeding herd until the cattle are mature enough to enter the feedlot.

The company began marketing its own brands in 1973 after a visit to Japan where they saw the opportunity to market premium, Australian beef.

Products

Stockyard specialises in the production of long grain fed Angus and Wagyu beef using non-GMO feed and no hormone growth promotants. There are three tiers of beef products in the brand stable:

Long grain-fed, Angus cattle on high energy ration



400 day plus grain-fed, F1 cross to purebred Wagyu with marble scores from 4 to 9

400 day plus grain-fed, hand selected Wagyu with marble scores of 9+

Stockyard Beef has invested heavily in breeding and genetics with a focus on efficiently and sustainably producing consistently high-marble, score beef with outstanding eating quality. The Wagyu fullblood and crossbred cattle produced are predominantly derived from the bloodlines of cattle from the Tajima Prefecture of Japan, a breed renowned for high marbling. The business uses performance benchmarking to track the genetics and feeding formula. DNA tracing and independent grading systems are provided by AUS-MEAT and Meat Standards Australia frameworks.

Markets and customers

Around 85% of Stockyard's production is exported. Markets include Japan, Korea, Taiwan, UAE, Jordan, Bahrain, Kuwait, Saudi Arabia, Hong Kong, China, Singapore, USA, The Philippines, Indonesia, South Korea, and Thailand.

The company has built a global footprint with a client base of leading high-end foodservice and retail outlets through a network of strong alliances with exclusive importers, wholesalers and retailers.

Brand positioning

The Stockyard Beef brand is founded on excellence in every respect of production and ultimately in eating enjoyment. The brand promise emphasises the eating experience:

"We create inspiration, enjoyment and memories"

Stockyard Beef's commitment to excellence includes being a leader in environmental sustainability, animal welfare and Corporate and Social Responsibility:

"We strive to find ways to better care for our animals, the environment, the community, and each other."

Supply chain model

Stockyard Beef sources cattle from partner breeders and graze mostly on their own farms with some supply coming from producers with whom they have a trusted alliance.

All cattle are grazed for 12 to 36 months on farms in the region before moving to the feedlot where they are finished for anywhere from 200 to 400-plus days. The animals remain in their social group for the duration of time in the feedlot to maintain their natural social hierarchy. On the feedlot the cattle roam freely in yards that are around 3000 m^2 with 24/7 access to clean water and shade and a twice-daily feeding schedule designed to meet natural daily feeding patterns. The company has the capacity to manage 20,200 cattle at any time. The cattle are fed customised rations that are GMO-free and have no hormone growth promotants. They are processed at John Dee, Warwick and Australian Country Choice, Cannon Hill.

1.3 Product integrity approach

Stockyard Beef take the view that there needs to be integrity in every element of the organisation. In their view integrity is multi-faceted and their goal is to continuously improve in all these facets. The long list of accreditations includes both industry standard accreditations and certification of enhanced integrity systems:

Global Gap
Livestock Production Assurance
NFAS Grain Fed Guarantee
National Livestock Identification System
Animal Welfare Truck Safe
European Union Cattle Accreditation Scheme
Australian trusted Trader
JAS-ANZ
ISO 9001:2015
AUSMEAT
HACCP
Safe Food QLD
MSA
Halal.

Stockyard Beef engage with their export customers regularly and indicate that many do have quite a detailed understanding Australia's integrity systems including NLIS tags and food safety regulations; and that all of them value this in Australian meat generally. While most customers are satisfied with the Australian industry standards, the Stockyard Beef team feel that there are gaps that the industry and the organisation need to keep working on (see final report for further detail), and they are committed to continuously improving these and contributing to the industry discussion.

The Stockyard product integrity story is heavily built around attention to detail at every link in the supply chain from genetics through to finished product. The organisation regularly tests its traceability systems under various scenarios. Being first and foremost a farming operation, there is a strong focus on the integrity systems on-farm. The company supports its claims of being an industry leader in animal welfare and environmental management and asserts that its products are being produced and processed to the highest standards in the world, in collaboration with their processing partners.

1.4 Enhanced integrity elements

Because of the brand positioning around the notion of 'excellence', many of the Stockyard Beef integrity efforts go well beyond industry standards. The in-house programs on animal welfare and environmental sustainability now appear to form part of the corporate culture and values. The management believe that their commitment to integrity should be measurable but acknowledge that this is not always easy. They see that blockchain presents a potential solution to verification of the company's efforts to prove their excellence in integrity and have been working on capturing its potential for some time. Besides traceability, the team felt that blockchain would offer the following potential benefits:

- Enhanced data security
- Access to certification of authenticity
- Evidence that the beef products are genuine
- Evidence of food safety integrity at every point in the supply chain from processing through all stages of shipment and logistics

- Real time and transparent information along the supply chain
- Inventory management
- A marketing channel direct to the consumer that enables them to tell the story of the brand and its promise, highlighting the tangible benefits.

Interestingly, Stockyard Beef had never had any requests for enhanced traceability from any customers prior to undertaking the blockchain trial but the understanding was that blockchain would give the company a greater level of control beyond the point of dispatch.

The blockchain trial

In 2020, Stockyard Beef began the trial to test the benefits of blockchain through an MLA supported research project aiming to trace from farm to retailer. The intent was to utilise blockchain and associated technologies to provide a single source of truth on the provenance and transparency of the supply chain to a long-term retail customer in the Singapore market and open a marketing channel to the consumer. An external platform provider was engaged and sophisticated tracking devices were used in the trial. The retail partner was a premium butcher and restaurateur who is a long-term customer and supporter of the brand.

The research project aimed to build capability of both the technology provider and Stockyard Beef personnel, as well as integrate technology between the five parties involved. Fostering supply chain cooperation provided the rationale for supporting the project with industry investment.

Stockyard Beef's motivation for driving this research

While the Stockyard Beef team note that there are still some remaining gaps in beef integrity systems within Australia, they feel that there is greater vulnerability beyond the point when the product leaves the processor. The central motivation for investing in this trial was to protect Stockyard's premium brands from potential fraud and assure consumers purchasing this high value meat that the product is genuine. The secondary motivation was to develop B2C marketing relationships, rather than rely totally on B2B communication to build brand profiles.

Essentially, it was expected that blockchain would provide more transparency in a trusted format and in real time to the distributor, retailer, and consumers. It was thought that this study would leverage Australia's competitive advantage as a world leader in supply chain safety and reputation for quality in a world where consumers seek assurances that the product they purchase meets stringent biosecurity, food safety and quality standards and integrity in terms of ethics and good corporate behaviour. Stockyard management feel that this level of trust is what enables them to achieve premium pricing on their beef against lower cost competitors.

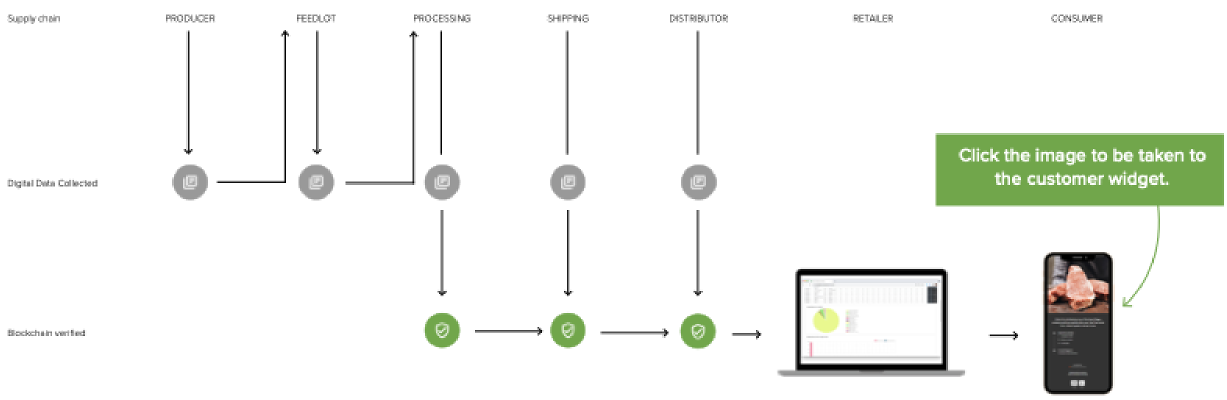
Brand fraud

With the higher brand profile that premium products command, comes the amplified risk of products being substituted. Although incidents of fraud have been relatively low, the threat of it remains a concern for the business. Predominantly, meat marketers distribute through importers and wholesalers, with only a small proportion of exported beef being sold directly to the end customer or consumer. Consequently, the brand owners are heavily reliant on their prime importer/distributors to be the custodians of their brands in export markets and most seem to be confident that this trust can be justified. The issue is when the product is sold on to secondary wholesalers (in emerging markets, product can pass through several hands before reaching the end customer) and on to unknown retailers and foodservice outlets. Stockyard Beef counter the risk of fraud by working with exclusive distributors in each market. In most markets the company has trademark protection of the Stockyard brand to fall back on but have not had to test this.

The blockchain mechanics

The flow of data along the blockchain requires data inputs from the producer, feedlot, processor, logistics provider distributor and retailer. The application of a QR code to retail packs at the retail outlet enables the consumer to access provenance information and recipes that are updated every quarter.

INFORMATION FLOW ALONG THE BLOCKCHAIN



SOURCE: STOCKYARD BEEF, 2022

The blockchain relies on standard industry and government systems for traceability backwards from the case ready floor. Due to the constraints in the processing plants, the closest link backwards that the company can attribute to is the slaughter date. This data is captured by the platform (middleware layer) which enables input of the data into the provenance blockchain. This process is an automated data upload.

Data is only provided from three sources throughout the process Stockyard, the retailer and the data logger.

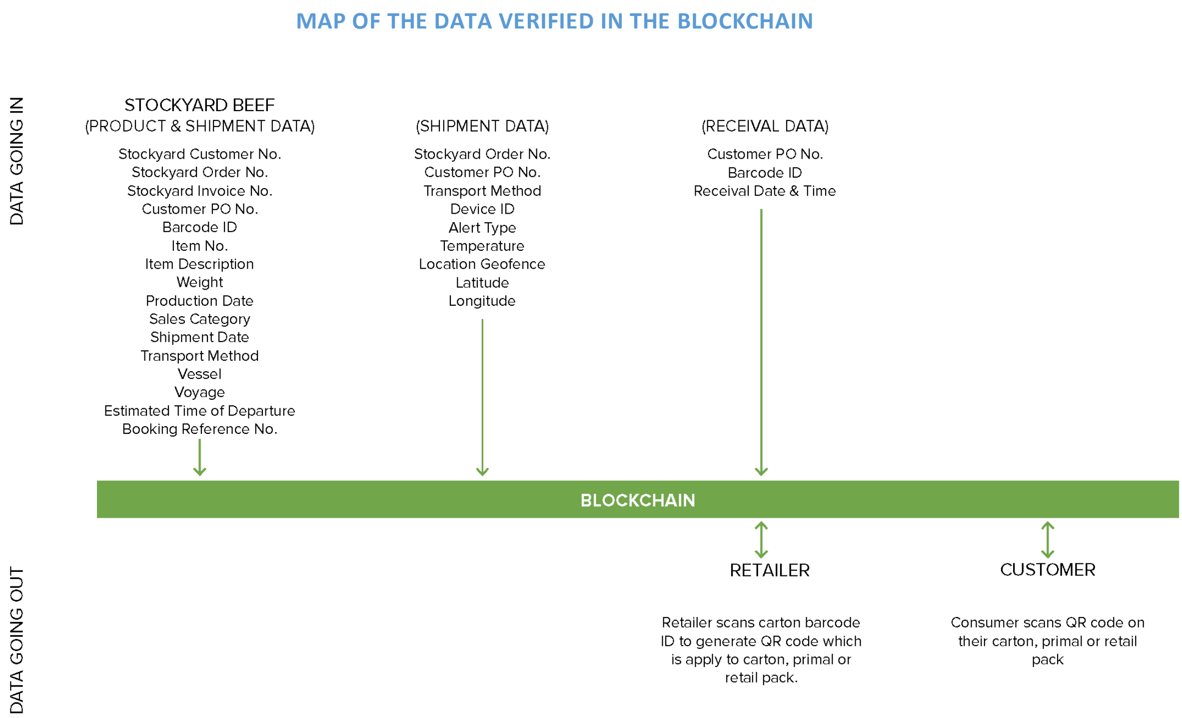
The data loggers monitor the product throughout the journey, from production to retailer using blockchain technology. This technology involves adding a 'blue box' to each carton which continuously transmits real time data from the carton including shipment details, who is in possession, temperature, location and more. This data is inputted at the point of despatch and is transmitted via a 4G mobile phone signal. When the transmitter is out of range of a phone signal, the data is captured and transmitted when it comes back into range. This data is accessible in dashboard form on the smart devices of authorised parties

The data is extracted from the existing systems of the distributor and retailer partners, which has the potential to achieve greater collaboration on inventory management. The retailer uploads the receival data on landing. The retailer scans the carton barcode ID to generate the QR code which is applied to the retail pack on wrapping the cut portion.

Consumers can scan a poster at the point of sale for general product information. For product that is cut and packaged in the store, they can scan the sticker using their mobile phone to get trusted information verifying the piece of beef they have chosen including when the product left Australia and arrived in Singapore. The content developed for the marketing messages linked to the QR code draws on insights from MLA research. The information will be able to be targeted to each market specifically (e.g. Japanese consumers can have messaging focused on food safety, while the Middle East on Halal authenticity).

Retailers can view analytics of consumers scanning behaviour per shipment, including location, device type and browser and the opportunity to uncover which marketing content consumers resonate more strongly with (recipes, videos, or promotions, etc.).

The project launch was supported with various pieces of point-of-sale material including an animated video that explains the blockchain verification.



Source: Stockyard Beef, 2022

Trial findings

It must be emphasised that this research project was undertaken during one of the most challenging periods facing the red meat industry. The trial was impacted by the pandemic (preventing in-person meetings and adding cost and complexity to international freight) and floods (disrupting local logistics and supply).

The Stockyard Beef trial has identified several challenges where the blockchain system has not yet been able to deliver to its expectations:

1. Although the data systems are compatible, the system relies on a second party (the platform provider) to ensure each action is visible to consumers.
2. Consumer scan data /analytics are currently similar to Google Analytics reporting (e.g. countries of users, users by device and browser, etc.). The capability to delve further into analytics reporting (e.g. consumer repeat purchase) is limited.
3. To receive complete transparency and results from the blockchain would require visibility across data flows from the distributors to the retailer to enable Stockyard to understand market share.
4. To date it has not been possible to incorporate the MLA shelf-life algorithms as part of the platform. This is being worked on in the background and should be overcome. The ability to accurately predict shelf life would be of great value to the retailer and help in stock management and order forecasting.
5. The system has been time consuming and disruptive to implement because of the need to engage several parties and the challenging operating environment with a pandemic and floods. It has taken some two years to get to successfully implement the trial.
6. The system involves considerable establishment and ongoing costs.
7. To implement the system requires the retailers to change their operations and labelling systems. One of the critical steps requires duplicating the QR code onto product when it is cut into portions in store (sometimes during the consumer-facing interaction). To execute this quickly and well, the collaborating retailers will need to see value in blockchain.
8. While the blockchain enabled QR code does allow Stockyard Beef to build a narrative directly with the consumer, the scanning uptake rate to date has been low.

Despite the challenges evident in this trial, Stockyard Beef view the customised blockchain traceability as a further opportunity to differentiate its branded beef program because of its potential to provide the following benefits:

1. Evidence that its beef products are genuine, given the threat of brand fraud with premium beef at the retail level.
2. Real time supply and shelf-life information critical to retailers for inventory management.
3. The opportunity to build direct relationships with the end consumer and to build the brand profile by being able to communicate directly with consumers. Traditionally Stockyard relied on the retailer to tell the brand story. The QR code provides the opportunity to not only confirm the veracity of claims and track the supply chain journey, but it also allows Stockyard Beef to connect directly with the end consumer and build brand trust by telling the brand story (excellence, family farming, animal welfare and sustainability). Note: QR codes can still be used as a marketing tool independent of a blockchain system.
4. Blockchain provides absolute transparency and credible evidence of food safety and product integrity at every point in the supply chain to all actors from production through to processing, shipment, and receipt.

Integrity gaps

Stockyard Beef believe that there are two stress points in the data integrity that industry needs to be aware of:

1. The weakness in the manual and paper based NVD process
2. The inability to trace primal cuts back to carcases and farms in the boning room.

Because Stockyard Beef control the step from grazing to feedlot by sourcing from either their own farms or a network of trusted partners, they can overcome the veracity of the NVD issue, however, they see this as a serious problem for the industry at large. Their concern stems from the belief that a residue issue from other producers would put the entire industry at risk by jeopardising market access to important export markets. They are very positive about the potential for a national meat industry blockchain or a secure data portal where electronic NVDs could be uploaded with full transparency. The ability to upload other certifications on such a portal would be viewed as highly beneficial. The company believes that the issue of traceability through the boning room is less of a concern as product can be traced to a batch easily.

1.5 Integrity as part of the brand value proposition

The Stockyard team note that integrity is a critical aspect of a premium brand. They point out that there is a hierarchy of messaging that needs to be communicated:

1. Is it Australian? (and therefore safe)
2. Is it the breed claimed?
3. What is the brand promise?

Although not part of their current trial, the blockchain system does have the capacity to verify the first two integrity factors and then tell the brand story to promote the third integrity factor (which was the focus of this trial).

The Stockyard Beef team noted that some years ago, Brand Australia used to be a negative because Australian beef was known as commodity, grass-fed beef and usually delivered a worse eating experience than Stockyard Beef. The Australian industry's advances in integrity systems in recent years has changed this and elevated brand Australia. Stockyard Beef now use the Australian True Aussie Beef logo on all product packaging and every carcase is MSA graded.

1.6 Case study learnings from Stockyard Beef

The blockchain trial was still incomplete at the time of writing this case study and the retailer was still facing disruption and store closures as a result of the pandemic. The initial feedback from the incomplete trial was that Stockyard Beef were finding it difficult to identify a potential return on investment. Consumer scan rates had been low, but they noted that if there was an uptake of scans, this innovation has the potential to provide valuable consumer insights. The company indicated that the blockchain trial has allowed them to engage with their distributor on a number of new levels including the issue of consumer insights.

At the early stages of the trial, one important observation was that a better understanding of what consumers expect out of blockchain verification would be especially helpful.

Feedback from the technology providers is that processors need to have a high level of IT knowledge in-house so that the technicians have a point of contact internally who 'speaks their language'.

In summary, key learnings from this case study include:

1. Blockchain and associated IoT technologies have been challenging and costly to implement. Stockyard recognise that as a pioneer of this technology, they are carrying significant expense in its development and that there is still a long way to go.
2. The potential to engage on a business to consumer level is very appealing and has the potential to build enduring brand loyalty through highly targeted marketing.
3. There is potential to involve a range of other supply chain actors in the blockchain like Government Departments, Banks, Shipping Lines and more.
4. The two stress points in the data integrity are the NVD process and the inability to trace primal cuts back to carcases and farms in the boning room.
5. While blockchain does entail practise change from the retailer, the retailer has a lot to gain by ensuring their own brand protection.

"Scanning of QR codes is low because consumers trust the retailer brand, so the retailer is the one that needs to be assured of product integrity.

Stockyard Beef Spokesperson

Case study 2: Jack's Creek managed supply chain

2.1 About this case study

This case study illustrates the following:

1. That for premium beef, proprietary brands have now become the source of trust for customers, highlighting the fact that brands and integrity systems in the red meat industry are increasingly symbiotic, i.e. brands are becoming the marker of product quality and product integrity is in turn, intrinsic to a brand's claim on that value proposition.
2. That a producer of a multi-award winning, super-premium beef can establish a premium market positioning and loyal customer base, without the need to enhance integrity systems beyond the existing frameworks of the Australian meat industry.
3. That a managed supply chain, in which certain operations are undertaken by contracted providers, is capable of demonstrating highly effective product integrity.

The product:	Super-premium, branded, long term grain-fed pure Wagyu and Black Angus
The markets:	80% of the product is exported to over 30 markets with Japan being the largest export market
The customers:	High end foodservice distributors, wholesalers and retailers
The supply chain:	The company breeds and backgrounds cattle at their own properties then uses third party feedlots and a service-kill arrangement with two strategic partners. The sales and marketing are in collaboration with in-market importers and distributors.
Product integrity system:	• All government and industry frameworks and data systems. • BRC (British Research Council) Global Quality Assurance standards • Third party verification systems (e.g. Angus Australia verified Black Angus program)
Key outtakes:	1. The essence of product integrity in premium brands is customer trust and confidence that they will consistently receive a product that meets their expectations. As such, product integrity and quality are inextricably linked. 2. Jack's Creek product achieves a significant premium because of customer trust in the brand to deliver consistently high eating quality. Enhancements to current integrity systems would provide only incremental additional value because best practice integrity is already assumed. Jack's Creek understands the need to remain in front of consumer requirements as they change over time. 3. Australian product integrity frameworks have provided the essential foundations for the establishment of premium brands, to the point that such frameworks now play a subliminal, yet vital, role in underpinning the trust in Australian meat.

2.2 Company profile

Jack's Creek is a leading marketer of premium, long-term grain-fed Wagyu and Black Angus beef. The company's business model is based on a managed supply chain where they breed, raise and background cattle on their own farms; manage contract feed lotting; service-kill processing through strategic partners and then collaboratively market the product with in-market importers/distributors. There is an absolute reliance on these strategic and trusted partners for specific tasks, but these are carefully managed relationships with Jack's Creek personnel on site at the supplier's premises being actively engaged at every step in the supply chain.

Jack's Creek is a family owned and operated Australian business dating back to 1852 when the Warmoll family migrated from Ireland to operate butcheries in the Australian goldfields. Later generations of the family established their farming enterprise on the Liverpool Plains. The business evolved into an Angus breeding stud. In 1991, brothers David and Phillip Warmoll began crossing their Black Angus herd with the Tajima Wagyu Sires from the Hyogo Prefecture in Japan. Having established a secure farming business, the Warmoll brothers then took the next step into contracting beef processing and building marketing expertise, forming the company Australian Certified Wagyu Beef, which has traded as 'Jack's Creek' since 2000. Jack's Creek became one of the first Australian companies to take a 'whole of supply chain' approach to facilitating the entire supply chain from breeding, growing, feeding, processing and marketing of Wagyu beef.

Products

The company specialises in premium grain-fed Wagyu and Angus, including pure bred Wagyu, first cross Wagyu, pure-bred Black Angus and Angus cross. All product is grain-fed, ranging from 120 to 500 days with marbling scores of up to 9, the highest possible under Australia's grading system. Jack's Creek was a consecutive winner of the World's Best Steak Producer award in 2015 and 2016 and was recognised for World's Best Grain Fed Steak, World's Best Ribeye Steak and World's Best Fillet Steak in 2021.

500 day grain-fed, purebred Wagyu	400 day grain-fed, F1 Wagyu	150 day grain-fed, verified Black Angus	120 day grain-fed, minimum 75% Angus

Markets and customers

The company is primarily focused on supplying export markets, shipping by sea and air to over 30 countries including most Asian markets (except China, as its processor partners do not currently have market access), the Middle East, Europe and North America. Jack's Creek has identified the USA, where the company has an office, as a key growth market. Jack's Creek's target market segment is premium beef with some more affordable options. Virtually all product exported is sold through importer/distributors who are the custodians of the brand in that market.

Around 20% of the company's volume is sold domestically, largely through wholesalers that specialise in supplying high-end restaurants and premium meat retailers.

Brand positioning

The Jack's Creek range of products is among Australia's highest value beef – the quality and consistency of the product allows Jack's Creek beef to command a significant premium above equivalent competing products, both within Australia and globally. The company management are strongly of the view that this premium is all due to the trust in the brand promise of '*tender and juicy beef, full of flavour with every bite.'* While the premium is achievable because the company deliver consistently excellent eating quality, the trust in the brand is also is underpinned by the associated integrity systems under which their processor partners operate, including Australian regulations and BRC Global QA standards, a point which is prominently stated on the product page of the company website along with the establishment numbers of their processors, whose brands are also important in underpinning the Jack's Creek brand promise.

Supply chain model

Jack's Creek supply chain model involves a close working relationship with outsourced service partners (feedlots and processing establishments) who are important, long term strategic allies. The company has its own breeding and backgrounding facilities but finishes on a large number of feedlots across NSW and Queensland. To ensure consistent year-round supply for all of the beef categories, Jack's Creek also works with trusted breeders to supply feeder cattle to their network of feedlot partners.

The cattle are processed at Northern Cooperative Meat Company in Casino and Australian Country Choice in Brisbane, which are both BRC accredited. The processing facilities have onsite warehousing and coordinate distribution in conjunction with Jack's Creek's dedicated logistics and documentation team.

2.3 Product integrity approach

The product integrity for Jack's Creek customers is expressed in the brand, which conveys trust in the authenticity and gives assurance that the end consumer will consistently have an excellent eating experience. Jack's Creek relies on its historic performance of being true to the brand to gain that higher level of trust demanded by discerning customers, who are paying a significant premium. This confidence in the brand is supported by the subliminal 'Brand Australia' factor, which projects the fact that there are government and industry systems and processes assuring food safety and truth in labelling in all Australian meat. On top of that, Jack's Creek management note that feedback from their distributors suggests that Brand Australia projects general perceptions of an unpolluted environment in regional Australia (discussed in more detail below).

The experience of the Jack's Creek management is that the product integrity systems established under industry and government frameworks are already globally recognised as being amongst the best in the world. There are some further quality requirements for certain customers, for example compliance with the BRC Global Quality Assurance Program, E.coli testing for certain markets, and other country-specific audits. Although these are in addition to Australian requirements, they are generally recognised as being a standard part of doing business for major markets or customers. In addition, some customers seek clarification of the existing programs and what they entail, but there is generally strong recognition of all Australian standards that are currently in place.

Like all other exporters, through the NLIS and standard processing line labelling systems, Jack's Creek can trace all product back to a specific production shift. Cartons have QR codes that link back to the company website.

The National Vendor Declaration (NVD) is relied upon to provide proof of the animal health, breed, feeding history and provenance of the stock. The Jack's Creek livestock manager works closely with an animal nutritionist and the feedlots within the network to ensure the ration is appropriate for their stock at different life stages, and information is shared on a regular basis regarding feed intake, animal health condition and any requirements for treatments.

Breed authenticity is a very important component of the Jack's Creek brand and customers in the markets they supply have a high level of recognition of the eating quality of the Wagyu and Angus breeds. To this end, Jack's Creek is a member of the breed societies (the Australian Wagyu Association and Angus Australia) and, in the case of their Black Angus program, is subject to third party audits to provide verification of the authenticity of the breed claims. AUS-MEAT product descriptors, supported by the NVD, and audit trails provide a high level of scrutiny that the product in the carton is the breed labelled.

Jack's Creek provides its service kill partners with detailed processing and product specifications, including trim details, and monitors the processing. The consistent feedback from the export marketing and sales teams is that trade customers can place considerable emphasis on the establishment number. As Jack's Creek is a non-packer exporter, the establishment number is often what an overseas customer, particularly if English is not their primary language, will look for as a known and trusted quantity. The QA standards of Australian plants are highly regarded for hygiene, traceability, truth in labelling and exceptional shelf life. All these are underpinned by the expectations of the regulations set in place by Australia.

Jack's Creek has, unfortunately, experienced brand fraud, albeit on a small scale. Passing off is more visible in the domestic market but it tends to be in small retail outlets or restaurants. It is the strength and premium value inherent in the Jack's Creek brand that makes it more vulnerable to fraud and this is harder to monitor in export markets. Although these incidents are small in scale, they could be the catalyst for loss of trust in the brand if they persist. The company recognises this and has chosen to monitor these instances internally believing that approaches such as blockchain verification would not be a viable solution based on current data generation, data ownership and management issues.

2.4 Enhanced integrity elements

The experience of the Jack's Creek management is that there is no benefit to be gained from investing in enhanced product integrity systems beyond the established industry and government frameworks, that are already at world's best practice. The company has not found the need, nor customer demand for enhanced integrity systems and the company has never been called on to trace any of its products. The fact that none of its customers have ever asked for more integrity features confirms the high level of confidence in Australia's product integrity frameworks.

MSA

Even though Jack's Creek does not label product as MSA graded, the MSA research and services offered to industry are highly regarded and utilised by the business. The insight gained on eating quality and the way multiple factors impact it has been valuable to creating a product that can meet its standards consistently. Being able to access the MSA team and produce independent research and analysis is invaluable.

Shelf life

A common view among meat exporters interviewed in this study is that Australia's key point of competitive advantage over premium beef exporters from other countries, especially the USA, is shelf life. Australian Wagyu has a particular shelf-life advantage over Japanese Wagyu. Whereas other countries usually offer 50 or 60 days of shelf life, Jack's Creek can conservatively achieve 150 days and beyond from different processors. The shelf-life advantage is believed to be due to the slower chain speeds and QA systems in place. Apart from the perception among customers that Australian beef is a cleaner and therefore safer product, the real market advantage of extended shelf life is that it gives importer/distributors the confidence to age for a longer period, which contributes to improved eating quality. Longer shelf life can also enable reduced product wastage. In Middle Eastern markets shelf life is also critical to market access and food safety authorities in the region are moving towards standards up to 120 days. With the COVID 19 disruptions to global freight, shelf life has become even more important to exporters and their customers.

2.5 integrity as part of the brand value proposition

Jack's Creek interacts more with trade customers (wholesalers and importers) than consumers, although their brand is building traction with consumers, particularly in fine dining restaurants, where it is more frequently appearing on menus. Because virtually all of the company's trade is through distributors, both in Australia and export markets, building brand awareness with the trade is considered the priority at this point in the business' evolution.

The brand value proposition is single mindedly around 'premium Australian beef' with a promise to every consumer of a *'tender and juicy beef, full of flavour with every bite!'* The reason to the believe this brand promise is built on several platforms as outlined below.

Grain fed, Wagyu and Black Angus breeds are key to the brand

The brand strongly leverages the reputation of Wagyu and Black Angus breeds for consistently good eating quality. These two breeds have a reputation with chefs and gourmet food purveyors as being the best eating quality. This reputation is particularly strong in China and awareness of Wagyu is also strong in South Korea. Verifying the breeding of the Black Angus cattle is an additional cost to Jack's Creek, but this is justified because it provides proof to the customer of eating quality and when premium prices are being paid. The management believe that this verification of the brand's point of difference is important. It is therefore also critical to them that the Wagyu and Angus Societies in turn continue to promote their brands. The NVD, NFAS and MSA systems and documentation that accompany cattle delivered to plants provide a framework of traceability and integrity for each and every production batch which flows through the truth in labelling systems in place to the end product.

Being grain fed is an extension of the consistently high eating quality of the Wagyu and Black Angus breeds. Australia has not historically been recognised as a major grain fed beef producing country, but more and more cattle are fed a controlled ration for at least a portion of their lives. Jack's Creek management believe that industry promotions should reflect all the various production systems in place in Australia and show the full range of beef produced (i.e. grass-fed, grain-fed, long-fed Wagyu), without prioritising one sector or type over another. From an integrity point of view, each category has to comply with largely the same requirements.

Provenance

The Jack's Creek marketing material heavily features the family story and the farm location on the fertile Liverpool Plains, which is known for its temperate climate and reliable rainfall. The strong family association also contributes to the sense of trust in the provenance and the family's proven expertise in producing premium beef. It is a relevant differentiator when many of the company's competitors are multinational corporations.

Paddock to plate supply chain

The marketing material makes a strong feature of the 'paddock to plate' supply chain, where the business has line of sight across the entire production from breeding through to the end customer. This enables team members to closely monitor the quality and integrity of its product. The fact that this is achieved through strategic alliances has not impacted the integrity perceptions of Jack's Creek with customers.

The 'Brand Australia' factor

Australian country of origin is a critical part of the Jack's Creek brand story firstly in the messaging about the natural, unpolluted environment in which the cattle are produced, but secondly in the sense that customers gain confidence from the knowledge that globally recognised and accepted food safety frameworks are in place, without the need to know the detail. The Jack's Creek team indicate that they support the use of the 'True Aussie Beef' logo wherever possible because the Brand Australia value proposition carries several tangible attributes underpinning their brand:

- Product safety
- Longer shelf life (confidence to age longer, carry more stock, less product wastage)
- Consistency (in eating experience, trim and order fulfilment)
- Truth in labelling (i.e. the product in the box is the breed, cut and weight as labelled due to AUS-MEAT systems)
- Reputation for being a trustworthy and transparent trading partner.

Notwithstanding that the Brand Australia factor is subliminal, it is critical. Without Australian provenance, Jack's Creek would undoubtedly have had more difficulty in establishing its premium brand. Australia's product integrity frameworks have provided the foundations on which Jack's Creek has been able to build a super-premium brand which, in effect, now overshadows Brand Australia. However, it is vital to note that if customer and consumer confidence in Brand Australia was diminished by a high-profile integrity breach such as a food safety or product substitution incident, this would seriously erode customer confidence in all Australian proprietary brands, especially the high profile, premium brands such as Jack's Creek. Such a breach would greatly diminish the ability of a brand owner like Jack's Creek to retain price premiums and it would take a long time to restore market confidence. In essence, a breach in Australia's red meat integrity systems is likely to devalue the beef industry substantially as it would erode this premium.

2.6 Case study learnings from Jack's Creek

Ultimately, Australia's product integrity systems underpin trust in premium beef brands. The Jack's Creek brand conveys to the customer and end consumer that they can trust in a consistently high-quality eating experience. Product integrity is intrinsic to a brand's value proposition and provides a logical reason to believe in the brand's claims.

The technical components of integrity including food safety, truth in labelling and traceability are captured by industry regulatory systems and reflected in Brand Australia. These are common to the claims of all Australian meat exporters. The view among processors and exporters is that these technical attributes of integrity are subliminal yet vitally important as customers trust them, even though they take them for granted. It is precisely because of this high level of trust that if a high-profile breach of integrity occurred in Australia, it would take a long time to repair the resulting damage to customer confidence because of the 'shock factor'. For this reason, the work of industry bodies in protecting these national integrity systems is regarded as pivotal.

"It is important that MLA builds and communicates a base line of what Australian beef stands for, then it is up to the brand owners to decide whether to add more"

Jack's Creek Management

Case study 3: Flinders + Co

3.1 About this case study

This case study has been selected because it tackles the issue of carbon emissions directly, a theme that emerged as one of the most prominent integrity challenges in the industry consultation for this project. It is also a story of 'first mover' advantage in leveraging extrinsic integrity factors for brand building.

The product:	Beef and lamb in both retail and foodservice formats
The markets:	Domestic and export
The customers:	Fine dining foodservice and high socio-economic retail customers
The supply chain:	Flinders + Co has distribution rights for premium beef and lamb brands (as well as other proteins) into foodservice and direct to consumer retail channels. Although a lamb-producer, the business is focused on the product development, marketing and sales links of the supply chain.
Enhanced product integrity systems:	1. Strong commitment to ESG factors of environment, community, ethics, and service 2. The first carbon neutral red meat offer in Australia
Key outtakes:	1. Extrinsic integrity factors can be a demand driver for red meat but only in some premium markets. 2. While it is not yet possible to pass on the full cost of carbon offsets, being able to make a carbon neutral claim does add value to a business brand as part of its CSR integrity credentials. 3. It is too early to judge whether carbon neutrality will provide a compelling long-term point of brand differentiation. There are question marks over whether purchasing carbon offsets will be an enduring strategy or whether it will be necessary to achieve carbon neutrality through industry carbon reduction.

3.2 Company profile

Flinders + Co is a boutique, family-owned marketer and distributor of premium red meat and other proteins into both domestic and export markets. The group also produces premium lamb. The business is managed by father and son duo David and James Madden.

Founded in 2010, the business started as regional lamb processing operation on Flinders Island in the middle of Bass Strait marketing 'salt-grass lamb' under the boutique brand Flinders Island Meat. Having difficulty in finding a distributor, the business began selling directly to foodservice outlets with high levels of customer service. Recognising the opportunity to offer a full-service providore model to fine dining and high-end foodservice outlets, James Madden rebranded the business as Flinders + Co and built up the foodservice distribution component of the business in Victoria initially, with the intent to rapidly expand its national footprint, which is occurring.

Products

Since its formation when it was focused on the development of its own lamb brand, Finders + Co has secured the distribution rights for a portfolio of boutique red meat brands into the Victorian foodservice channel. Over time the business has added a full offer of proteins to the range including chicken, pork, game meats and seafood and has also established a value-added range of restaurant and retail-ready beef and lamb products.

Markets and customers

Flinders + Co has established its business in Victoria and is now extending its providore offering into the wider eastern seaboard market. The business supplies on-line channels as well as supermarkets and gourmet food stores including Harris Farms in New South Wales and Gum Tree in Victoria. The retail customer is also serviced on-line though a specialist gourmet food website, ipantry.com.au.

Flinders + Co holds a non-processor export licence, acting as an export agent for several companies. It has rapidly developed a significant export business across a diverse range of markets including Saudi Arabia, UAE, Oman, Maldives, Singapore, Hong Kong, Japan, The Philippines, and Vietnam. Flinders + Co's export trade also predominantly supplies high end foodservice outlets in these markets.

Brand positioning

The brand positioning of Flinders + Co is 'gourmet premium' reflecting its core business of servicing high end restaurants. The 'brand fit' with the stable of premium brands it represents is strong. The Flinders + Co lamb brand 'Roaring 40s' shares a similar positioning with the leading brands they distribute for others a number of which focus on wild and natural Tasmanian provenance and the Victorian grass-fed story.

The marketing materials for Flinders + Co strongly features the supplier brands and the stories behind the people who produce the products and their shared values. This builds a cohesive brand proposition despite the broad mix of products and suppliers.

The Flinders + Co brand stable has high design values reflecting the fact its market is at the premium end of the spectrum. The Phat Butcher, Roaring 40s and sub-brands including Home Chef, Clean Label Series emphasise high end dining with the retail promise of *"restaurant quality meat at home".*

Supply chain model

The supply chain model reflects the company's primary business of foodservice providoring. The Roaring 40s lamb brand is service-killed and contract packed and the retail value-added products are packed at the company's own facility. Flinders + Co adds substantial value in the supply chain in product development, marketing, and distribution.

3.3 Product integrity approach

Flinders + Co management do not have any concerns with Australia's intrinsic integrity systems (i.e. food safety, traceability, etc.), believing the existing intrinsic systems deliver safe food that is true to its promise. Therefore, the focus of this business is on enhancing its extrinsic integrity credentials (i.e. the values-based integrity factors such as humane treatment, sustainability and ethics). Flinders + Co has a strong commitment to ESG principles. Its corporate values are underpinned by four pillars: Planet, People, Product, and Performance as outlined below. These values are more than just claims, the company has a detailed suite of projects under each of the four pillars outlined below.

Pillar 1: Planet

The central element of this pillar is the achievement of carbon neutral certification for every product ranged. (The carbon neutral program is explained in more detail later in this case study.) Other actions under this pillar include a project to move to reusable crates and plastic packaging reduction.

Pillar 2: People

Flinders + Co goes to great lengths to nurture strong relationships with is suppliers, customers, and communities. Projects here include support for investment in kitchen equipment for customers and chef training apprenticeship support.

Pillar 3: Product

Quality and consistency are critical given that the customer base is largely high-end foodservice outlets. To achieve quality and consistency, Flinders + Co works closely with its suppliers and undertakes 'whole of supply chain' reviews with the aim of not only improving quality but ensuring alignment with the company values.

Pillar 4: Performance

Customer service is key to the success of the business given the premium foodservice customer base. To this end there is a commitment to continuous improvement with innovations such as dry aging beef, dedicated next day delivery and flexible, 'any device' ordering systems.

3.4 Enhanced integrity elements

It makes marketing sense for Flinders + Co to focus on enhancing its extrinsic integrity factors. Although it produces the Roaring 40s lamb, as a distributor, Flinders + Co is less able to influence the intrinsic integrity factors (i.e. physical product integrity attributes) on most of its range. The intrinsic integrity factors are the focus of Australia's red meat integrity system and are largely the part of the supply chain where the company's suppliers are held to account. Effectively, Flinders + Co leverages the intrinsic integrity credentials of their suppliers who hold the industry standard certifications as well as a suite of enhanced integrity certifications (e.g. Never Ever program). Flinders + Co has less control of the intrinsic integrity factors in the product it distributes, but does make a point of selecting trading partners who share their values.

Flinders + Co was reportedly the first meat business in Australia to make a 'carbon neutral' claim in its marketing, launching 'carbon neutral' branded product on 1 December 2018. Flinders + Co does this by offsetting all carbon emissions, from not only its business, but every kilogram of meat it sells. The company took a strong stance on carbon neutrality because it felt that the industry had not pushed back hard enough on the negative commentary in social and mainstream media about the allegedly damaging impact of red meat on the environment (e.g. the 2014 film Cowspiracy). The company could not see any counter-narrative emerging from industry in defence. Flinders + Co Managing Director James Madden believed that the red meat industry did have grounds to counter the activists with a compelling argument that red meat was not as damaging as cropping and propose further benefits around health and ethics (a position that food industry influencers such as Mathew Evans have taken up).

Carbon measurement

The starting point for the Flinders + Co carbon neutral journey was to measure the carbon footprint of the business and that of its suppliers using life cycle assessments that are matched to the production methods for each of its suppliers in order to determine the footprint of the individual products. This measurement is audited as part of the NoCO2 Program by the Carbon Reduction Institute. This is one of the first climate change certification programs in Australia to measure the total carbon footprint, determining the Greenhouse Gas (GHG) emissions that resulted from their operations over the 2017 financial year. The emissions from all operations were calculated through the application of numerous published life cycle emission factors along with the use of multi-regional input-output tables. Each emissions factor is scaled to a level of consumption for its impact area, for example a kilowatt-hour of electricity or a litre of fuel. It was determined that the total GHG emissions from Flinders + Co's relevant operations and activities, within the boundaries of the NoCO2 program, were 9,922.94 tonnes of CO2e (tCO2e) over the FY2017 period.

Carbon offset purchase

The carbon footprint of Flinders + Co is now calculated quarterly, and carbon offsets are purchased from the global marketplace. A tonne of carbon offset needs to be purchased for every 40 kilos of meat. Current Australian market prices for carbon are around $18 per tonne which equates to a cost of around 25 cents per kilo. At present, Australian carbon prices are higher than global prices but this could change with the Australian Government's 2022 policy revision.

Having learnt from their own market research that the main drivers of red meat sales are price, taste, quality, freshness and convenience, the zero-carbon promise had to be made without adding a further price premium to the product. Flinders + Co did not pass on the cost of the carbon credits to the customer, but noted that there may come a point when it is no longer possible to absorb these costs, especially given the high cost of meat, in this case, the carbon credit cost could be presented to customers as an optional extra. Flinders + Co was partially subsidised for the carbon neutral marketing exercise with funding from the MLA 'CoMarketing' program.

The company's carbon offset is certified by the Carbon Reduction Institute, the longest running climate change certification program in Australia, which follows an ISO approved international standard for carbon measurement.

Carbon reduction versus carbon offset

Many customers, particularly those in the USA, do not view carbon offsets favourably, seeing them as an excuse to avoid carbon reduction activity and not contributing to real solutions to the global decarbonisation challenge. Flinders + Co discovered that US customers will not pay a premium for a zero-carbon product based on offsets. Therefore, in parallel to the purchase of carbon credits, Flinders+ Co has embarked on several projects to reduce its carbon footprint, which includes the conversion to renewable energy, plastic packaging reduction and the use of reusable crates. In addition, the company's alliance with other producers who also have a strong ethos on reducing carbon emissions to almost zero.

Future options for enhancing integrity

While carbon neutral has been the focus of recent marketing efforts by Flinders + Co, it is not the only initiative it is exploring ways to enhance the eating experience of customers and consumers with constant activity on new product development. Value-adding with contemporary global cuisine styles and innovative, sustainable packaging is regarded as the next frontier of integrity for this company. It was noted that value-adding and unique packaging cannot be easily copied by competitors in Uruguay and Argentina. However, enhanced extrinsic integrity factors will remain top of mind as the business develops these new ventures because it is committed to the four pillars outlined above.

3.5 Integrity as part of the brand value proposition

Being a market-driven business, Flinders + Co management were looking for the *blue ocean* as a point of brand differentiation. Blue Ocean Strategy (2004) by W. Chan Kim and Renée Mauborgne, deals with how to find uncontested space in a market by looking at the brand attributes that are valued or will be valued by customers in the future and which are not being serviced by competitors. The company invested in a considerable amount of market research before making the decision to go carbon neutral. Based on feedback from customers, Director James Madden was firmly of the view that extrinsic integrity factors such as environmental sustainability and social responsibility will progressively become more important drivers of brand choice.

The business was increasingly being questioned by its customers about the environmental sustainability of its products and progressively, this questioning was becoming more intense particularly from markets such as Singapore. In response, Flinders + Co made the decision to make carbon neutrality the centrepiece of is ESG brand value proposition.

This strong emphasis on extrinsic integrity factors in the company's four pillars including carbon neutrality, aligns precisely with the company vision to '*Cultivate a better food world'*. The Flinders + Co management emphasize that the carbon neutral claim is just one element of the brand promise with flavour and provenance featuring in all the brand messaging in export marketing.

3.6 Case study learnings from Flinders & Co

Flinders + Co openly revealed that the strong market research feedback about the importance of carbon neutrality has not necessarily been reflected in customer purchase decisions and the company may have moved too early in breaking new ground on this marketing proposition. Some competitors who were early adopters have already walked away from a carbon neutral commitment.

Some export markets have been more responsive to the carbon neutral integrity claim than others. Singaporean customers are reacting positively but in Saudi Arabia the topic is not considered relevant. In markets like the Maldives, German tourists are especially interested in carbon neutral.

Flinders + Co remains committed to adding value to its stable of brands through enhanced extrinsic integrity factors, but it is too early to tell whether this brand promise is better placed on a product brand or on the corporate brand, i.e. while a 'carbon neutral' claim on a pack may not pull through sales to the extent that the market research promises, the value may be greater in enhancing the integrity credentials of the corporate entity and establishing the business as a trusted trading partner with values that are aligned to leading foodservice companies.

Flinders + Co management did not believe that environmental sustainability will become a prime driver of brand choice, just that it will progressively become more important and of even more interest to buyers and consumers than at this point in time. The view expressed was that the prime drivers of brand choice in red meat, especially in a retail environment, will remain the so-called *"Big 4"* i.e., price, freshness, convenience and quality.

The Flinders + Co management generously and frankly admitted that they do not believe that carbon neutral has delivered a decisive competitive advantage, but perhaps a slight one. They do believe that the carbon neutral claim is continuing to add an increasing amount of brand value and will continue to so and as such, they will keep working and refining their approach to it.

"Product integrity to date in the industry has been about maximizing value in the supply chain rather than adding value. Enhanced traceability adds cost, we want to add value."

Flinders + Co Spokesperson

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6. Implications for the Australian meat industry

1.1 Implications for brand owners

Product integrity has come to embrace so much more than traceability. There is growing evidence in the broader food industry media that the CSR/ESG agenda is becoming more important than product and brand choice, or at the very least, becoming critical to underpinning a food brand. It now seems that the focus of integrity is shifting more to the behaviours of supply chain actors and their brand stories and away from the product itself. This suggests that meat businesses and the industry should perhaps shift the focus from intrinsic product integrity factors to promoting best practice around sustainability and ethically and socially responsible behaviours. Interestingly, the 2022 scan of recent meat industry literature did not discover any mention of issues around global warming or environmental sustainability as an integrity factor, which is arguably the highest profile integrity issue facing Australia.

If the reader is to take these conclusions at face value, it suggests that the Australian red meat industry needs to rethink its position on product integrity with a greater focus on building human capital around integrity, above and beyond the integrity technology.

As has been highlighted throughout this report, global, societal, economic, political and consumer momentum surrounding the broader notion of integrity is quickly gathering pace. As witnessed in the 2022 federal election, integrity issues are highly emotive and they have the power to change the course of history. In this operating environment, the potential for a brand's reputation to be destroyed by what is judged to be poor corporate citizenship is very real.

Although attention to integrity more broadly will be applied to all business sectors, the meat industry is likely to come under particular scrutiny because of persistent negative perceptions on issues such as carbon emissions, animal welfare, exploitation of workers, workplace safety and assumptions about general business ethics. Environmentalists and the plant-based meat industry lobby groups are aggressively targeting red meat producers and consumers, using conventional and social media to discredit the sector. To date, the focus has been at the industry level but in time, individual, high-profile brands are likely to be in their radar.

It is important that Australian meat marketers and the industry as a whole stay on the front foot in countering the negative perceptions, given that red meat brands are likely to be prime targets. Being put in a position of defensiveness is likely to negatively impact the industry image, whereas a proactively positive stance may enable industry to highlight the integrity enhancements that are being implemented.

Meat industry brand owners would be well advised to give priority to developing an ESG policy if they have not done so already. Of highest priority within this policy should be environmental sustainability. Pressure for meat businesses and the industry to commit to a carbon neutral target will come on two fronts, from both customers and society at large. It is highly likely that customers will progressively build sustainability and carbon neutrality into supply agreements, culminating in carbon targets. But processors will need to go beyond this by managing public perceptions through communications and issue management and developing mitigation strategies for damage control.

The ESG policies and plans will also need to be proactive on issues pertaining to animal welfare, workplace culture and safety, recycling and zero waste, ethics and corporate and social responsibility.

In the future, the credibility of claims will need to be substantiated and transparent, and it will be important not to make claims that cannot be verified. Where possible, third-party validation would be advisable and potentially industry could play a part in streamlining that through regulating more of the extrinsic integrity factors.

1.2 Future role of industry bodies in product integrity

Although brands are increasingly 'the public face' of industry integrity systems and more often the prime source of trust for customers and consumers, in the Australian red meat supply chain, there are still several critical roles that need to be performed collectively by the industry bodies which are discussed below.

1. *Socialise the need for action on extrinsic integrity factors*

During the consultation for this project, it became evident that there was a very high level of interest in this subject, as such, industry members would be highly receptive to information on the findings of this report communicated through summaries fact sheets, pod casts, etc.

While industry bodies have historically been the drivers of advancing intrinsic integrity factors, it could be argued that meat brand owners are now more proactively driving the extrinsic integrity enhancements. Industry bodies have a role in supporting members and levy payers in these efforts.

2. *Drive continuous improvement on the intrinsic elements of product integrity*

Australia's status as the most trusted supplier of red meat in many markets delivers significant value to brand owners and allows them to extract premium prices against lower cost competitors. This situation, which is embraced in Brand Australia, must be fiercely protected by industry bodies. The intrinsic integrity factors are predominantly delivered through industry platforms and this study has found that there is little incentive for brand owners to invest in enhancements beyond the existing systems and processes, because customers are generally happy with the established industry standards and will not pay more for enhancements such as improved traceability.

Exporters feel strongly that the Australian industry cannot afford to be complacent about this leadership position, given the critical importance of protecting Australia's reputation and because competitors countries are rapidly catching up. The Australian industry must stay at the forefront of integrity enhancing technologies, addressing any weaknesses (such as the NVD), elevating systems to beyond the reach of competitor nations and reducing the cost of the regulatory process through increasing digitisation and systems that remove duplication of effort.

Meat industry stakeholders feel strongly that the highest priority of organisations such as MLA is to improve the accuracy and compliance rate of the NVD which is adding cost and poses a significant risk to the credibility of Brand Australia.

3. *Develop a secure and accessible data exchange portal*

Processors would like to see the introduction of a blockchain or a secure data portal with permissioned access along the lines of that proposed by the Australian Agrifood Data Exchange project. They feel that such an exchange needs to be specific to the needs of the meat industry. The exchange would need a mechanism to streamline the compliance process through the application of technologies that remove duplication of effort and improve the connectivity of the various industry and government databases. In particular, it is important that there be standardised data management protocols to allow businesses to adapt the data outputs to their own software and internal reporting. Most of those interviewed had not heard of the Agrifood Data Exchange project but when such a concept was discussed, the general view was that it would probably be better for the meat industry to go it alone given that it is probably more advanced than other industries and the time and challenge of getting many diverse industries to agree to a universal approach could limit its chances of success.

4. *Develop a 'whole of supply chain' plan to support red meat businesses in reaching carbon targets*

It is inevitable that there will be mounting pressure on the meat industry from customers and government to deliver on its stated goal of carbon neutrality by 2030. The concern of processors is that, to the best of their knowledge, there is no plan as to how individual businesses can deliver the goal. Most of the businesses interviewed believed that they were well ahead of the industry effort in investing in carbon reduction programs and a small number had committed to carbon neutral goals. However, there is much uncertainty around aspects of the industry program such as measuring carbon footprints, the focus on 'on-farm' programs, the impact of the carbon reduction initiative, trading mechanisms and so on. What businesses need is a plan and practical toolkit that can guide them through this critically important and complex issue with an industry-wide approach.

5. *Develop an industry ESG plan and toolkit*

ESG is looming as the next frontier of product integrity for all businesses and industries. Consumers and society at large are progressively becoming more assertive and demanding greater accountability and transparency across a broad agenda, leading with environmental sustainability. Most of the major processors are grappling with the broader ESG agenda and many commented that they were struggling with the breadth of this topic. This suggests that there is a need to develop a practical tool kit that guides businesses in developing their ESG plans. The need also exists for an umbrella red meat industry ESG statement and plan of action.

6. *Acting as a conduit between technology providers in the development of product integrity tools*

There is a need for MLA to continue its work in connecting integrity technology providers with red meat marketers, to ensure that the industry has access to the cutting-edge technology that meets its needs. The project preceding this study (McKINNA *et al,* 2020) identified a major disconnect between technology providers and industry with businesses accusing technology companies of *'providing solutions to problems they do not have*', but at the same time, these businesses struggled to find technologies that suited their needs. A key part of the problem is that technology providers are not well informed of the industry needs in red meat supply chains nor of their priorities with respect to product integrity. MLA could perform a valuable role in continuing supplier forums and communications programs to inform providers of industry needs. The current program of targeted investment in trials with businesses has performed a valuable function in most instances and if learnings are shared widely it can be of value to industry.

7. *Develop product integrity tools*

Exporters believe that now that brands have superseded industry platforms in building customer trust; and extrinsic factors have taken over from intrinsic factors in brand differentiation. Therefore, they see the role of RD&E bodies and industry service agencies being to develop tools that businesses can use to support enhancing their integrity. In particular, there is a need for self-assessment tools that can help businesses to test their performance on extrinsic integrity factors in the same manner that they do for extrinsic factors with appropriate metrics and measurement tools. An example of this would be a benchmarking tool to evaluate where each business stands on ESG factors. The literature indicates that integrity systems are as much about culture as they are about systems so tools for evaluating organisational culture may also be called for.

8. *Educate export customers about Australia's leading integrity factors*

Exporters feel that MLA does have continuing role in educating customers and consumers in overseas markets (especially in emerging markets) about Australia's red meat product integrity platforms. While most exporters believe that Australia's leadership in product integrity, a key foundation of the industry's competitive advantage, is well understood in core markets, there is less awareness in emerging markets. While the Kantar (2021) report recommended educating buyers about more of the detail of integrity systems in all markets, exporters believe that more general awareness is needed in a broader market reach.

9. *Harmonising extrinsic integrity systems?*

The ever-increasing range of accreditation systems or licensed integrity programs is becoming confusing to many in industry and resulting in a plethora of disconnected logos on cartons. It was suggested that MLA develop a series of Australian extrinsic integrity programs that are endorsed with harmonised Australian standard on these issues. This could be an MLA mark such as a colour coded check mark indicating if a processor is ticking the box for each extrinsic integrity factor i.e. no HGP, regenerative farm practises, ESG policy, etc.