Dairy farmers love sharing data…but there is a 'but'

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Executive Summary

As the New Zealand dairy sector navigates increasing consumer scrutiny, technological disruption, and regulatory expectations, the role of on-farm event data has come into sharper focus. This research set out to answer a simple but nuanced question: Are dairy farmers incentivised to know about and share accurate on-farm event data, or do they prefer to present data that is favourable in the eyes of downstream consumers?

Drawing on interviews with dairy farmers, milk processors, and agri-tech firms, this study reveals a nuanced landscape shaped by incentives, trust, control, value perception, and the broader data ecosystem. It introduces the "make/save/comply" framework, a practical model that captures the motivations behind farmer engagement with data.

Key Finding: Farmers Are Rational, Not Resistant

The overwhelming conclusion is that farmers are willing to share data however it is conditional, based on a rational assessment of:

- Control over who sees the data and for what purpose.
- Trust in the requesting party and the data's intended use.
- Tangible value returned from sharing, whether financial, operational, cultural or strategic.

Data sharing occurs within a spectrum rather than a binary choice. When these three conditions are met, farmers demonstrate a high degree of professionalism and transparency. When they are not, farmers may lean toward selective or minimal disclosure, not to deceive, but to protect their business from misinterpretation or unintended consequences.

Introducing the "Make/Save/Comply" Framework

A central contribution of this research is the "make/save/comply" framework, which emerged from interviews across all stakeholder groups. It categorises the perceived value of data sharing as:

- Make – Increasing productivity, accessing incentive programmes, genetic gains, or market premiums.
- Save – Reducing cost, time, and complexity (e.g., lower vet bills, automated compliance).
- Comply – Meeting industry, regulatory, or processor obligations to operate.

This model resonates strongly with both farmers and agri-tech firms and provides a common language for discussing the incentives underpinning data sharing. Importantly, compliance-related data (the "comply" category) was identified as the most sensitive, often invoking hesitation unless communication and support are strong.

Trust and Control as prerequisites

Across interviews, trust consistently emerged as a key enabler of accurate data sharing. Farmers are more willing to share when:

- They understand the purpose of the request.
- There are clear boundaries around data usage.
- They receive insights or benefits in return.
- They can provide context around the data to avoid misinterpretation.

Trust underpins the Make/Save/Comply framework. Where trust is low or the requesting party is seen as overreaching, farmers become more cautious. Examples include fears that lameness or mastitis data, without context, could unfairly disadvantage them. Some processors and agri-

tech firms are actively addressing this by developing "managed connections" features, improving transparency and ensuring farmers retain control.

Evolving customer expectations and their impact

One of the forces driving increased interest in farm-level data is the shift in customer expectations, particularly among key corporate commodity buyers such as Nestlé and Mars. While end consumers are not always seen as the direct drivers, major commodity customers now demand proof of sustainability, traceability, and animal welfare.

Milk processors have responded with incentive frameworks like Fonterra's Co-operative Difference, Synlait's Lead With Pride, and Miraka's Te Ara Miraka, all of which depend on farmer-supplied data. These programmes offer financial bonuses (up to $0.20/kgMS in some cases) and signal market alignment but also raise the stakes for farmers in terms of the nature and accuracy of what they report.

Favourable vs. accurate: a subtle tension

There exists a delicate tension between sharing accurate data and presenting favourable data. This is not rooted in deceit, but in defensiveness, farmers want to avoid being penalised for anomalies that may be beyond their control or misunderstood without context. Selective data reporting is most likely when:

- Incentives or penalties are tied to thresholds.
- The data's interpretation is unclear.
- There is a lack of trust in the party requesting it.

However, where there are strong relationships and mutual benefit (particularly with agri-tech firms providing operational insights), farmers tend to provide complete and accurate data. This reveals the importance of framing the request for data as a tool for support, not surveillance.

The role of agri-tech firms and system design

Agri-tech firms play a pivotal role in shaping the data-sharing environment. Farmers show high levels of trust when these firms:

- Focus on enabling decision-making, not just data collection.
- Design products around practical value rather than compliance pressure.
- Prioritise interoperability and reducing duplication.

Integration across systems remains a major frustration for farmers. Despite progress from platforms like LIC's MINDA Integrations, many still report the burden of manually transposing data between platforms. This duplication erodes the incentive to share and diminishes data quality.

Reframing relationships: the coaching analogy

To help clarify roles and expectations, this research introduces a novel "coaching team" analogy to describe how farmers interact with various stakeholders, processors, agri-tech firms, consultants, and regulators. Just as a professional athlete works with a team of specialised coaches (e.g., performance analyst, strength and conditioning coach, nutritionist), so too do farmers engage with domain-specific experts.

Each coach has a role and a time horizon:

- Attach coach: Supporting national branding and premium market access.
- Sports psychologist: Driving long-term innovation.
- Rehabilitation coach: Supporting animal health.

- ...and others.

This analogy helps stakeholders contextualise data requests in a way that aligns with their role and relationship with the farmer. It also gives farmers a useful mental model for evaluating the relevance of requests, helping to reduce friction and increase cooperation.

Final reflections

This research finds that data sharing is neither inherently problematic nor universally embraced. Rather, it depends on:

- Relevance: The data request must align with the role and relationship of the requester.
- Value: The farmer must see a clear and proportionate benefit.
- Trust and control: The data must be handled ethically, securely, and transparently.

Where these conditions are met, farmers are willing and even eager, to share data that is accurate, timely, and actionable. Where they are not, favourable data or minimum compliance becomes the fallback.

The challenge for the dairy sector, and the broader agri-food industry, is to build a shared data culture grounded in trust, clarity, and mutual benefit. This includes:

- Aligning incentives with outcomes.
- Investing in interoperability.
- Standardising data governance practices.
- Educating farmers on data value and sovereignty.
- And above all, respecting the farmer's role as a steward of both land and information.

In a world where market access, compliance, and competitive advantage are increasingly data-dependent, creating a farmer-centric data ecosystem is not optional, it's essential.

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1.Introduction

The New Zealand dairy industry is a cornerstone of the nation's economy, contributing $25.7billion in exports in the year ending March 2024 - representing 24% of total New Zealand export values as detailed in a recent report by Solid Foundations (2023). They add that New Zealand is one of the world's leading dairy exporters, with the dairy sector playing a crucial role in the country's economic stability and rural prosperity. Employing over 55,000 people, the dairy industry is not just important, it is a lifeline for many communities.

The landscape of dairy farming in New Zealand is undergoing significant transformation, driven by evolving consumer expectations (Duncan, 1998), technological advancements (DairyNZ, 2023) and regulatory reforms (McClay, 2024). As the sector faces increasing pressure to demonstrate sustainable and responsible farming practices, questions arise around the incentives for dairy farmers to know about and share accurate on-farm event data. Specifically, it is important to examine whether farmers are motivated to be fully transparent with their data or if they selectively present information that is favourable in the eyes of downstream consumers, including processors, retailers, and ultimately, end-users. Understanding these dynamics is essential as data becomes an increasingly critical asset in the agricultural value chain, influencing everything from market access to consumer trust and regulatory compliance.

Further structural challenges such as an ageing workforce, labour shortages, a contracting national herd, and the implementation of emissions reduction measures are expected to constrain production growth. While not an exhaustive list, these macro-level issues signal a shift that will reshape the sector in the medium term.

Customer expectations are placing greater demands on accurate data collection and reporting, compelling farmers to provide detailed and verifiable evidence of their environmental performance. Alongside this, the Animal Welfare Act (New Zealand Government, 1999) through the Code of Welfare (Ministry for Primary Industries, 2019), requires data to substantiate compliance, further emphasizing the role of reliable information in maintaining farm credibility.

In response to these challenges, New Zealand's agri-tech sector has become increasingly active. As of 2019, there were over 950 New Zealand agri-tech firms operating across the primary industries, with two-thirds focused on animal and crop health, environmental management, and data solutions (Wren-Hilton et al., 2023). Furthermore, international firms have invested in New Zealand offering farmers options. Encouragingly, farmers are adopting innovative technologies to address productivity and environmental concerns (DairyNZ, 2023).

According to a Agritech New Zealand (2023) digital adoption survey, 59% of respondents indicated a leaning toward the adoption of digital technologies. In the dairy sector, this is reflected in continued investment in milking automation, in-shed feeding systems, automated cup removers, and wearable technologies. The recent DairyNZ (2023) technology adoption paper highlights a marked increase in the uptake of Internet of Things (IoT) devices, which offer real-time monitoring of various farm parameters such as animal health, soil conditions, and environmental factors (Agritech New Zealand, 2023). These technologies enable farmers to gather large volumes of data with greater accuracy and frequency than traditional methods. Over the past 12 months, industry partners have reported substantial growth (Deloitte New Zealand, 2024) in the deployment of such technologies, reflecting a collective move towards digital integration in dairy farming. This momentum suggests that farmers recognize the value of technological tools in improving farm performance and regulatory compliance (Wren-Hilton et al., 2023).

In addition to domestic regulations, international trade dynamics influence the data-sharing behaviours of farmers. Free Trade Agreements (FTAs), which New Zealand relies on for market access, increasingly incorporate provisions related to environmental and animal welfare standards (Ministry of Foreign Affairs and Trade, n.d.). In future, negotiating or renegotiating these agreements may bring heightened expectations for transparency and data accuracy to substantiate market claims around ethical and sustainability criteria both behind the farm gate and broadly across the supply chain. While future FTA implications are possible, expectations around animal welfare and environmental standards from major international commodity buyers such as Nestle (*Sustainability at Nestlé | Nestlé New Zealand*, n.d.) and Mars (*Policies & Practices | Mars Global*, n.d.) are known and required now. This dimension underscores the strategic importance for farmers to adopt transparent and trustworthy data practices, not only to comply with local laws but also to maintain competitive access to lucrative export markets.

However, the adoption of IoT technologies also brings challenges related to the understanding and interpretation of data. Additional consideration needs to be given to providing context to data when being shared – what was preventative vs reactive action, what was planned vs unplanned.

Understanding the key motivators behind farmer adoption of IoT technology provides valuable context for data-sharing behaviours. Farmers are driven by the practical benefits that these technologies offer, such as the ability to benchmark their performance against peers and identify specific areas for improvement. Efficiency gains and workload reduction are also critical factors, as automated data collection and prioritised alerts enable farmers to focus their attention on the most pressing issues, reducing the risk of being overwhelmed by data overload. Moreover, IoT tools help fill skill gaps by providing actionable insights that may not be readily available otherwise, empowering farmers to make informed decisions. Once such example is CowManager (n.d.) not only detecting heats but also suggesting an optimal time for using sexed semen during a heat. These motivators suggest that farmers have strong incentives to engage with accurate data for internal management purposes. However, whether these incentives extend to full transparency with external stakeholders, especially downstream consumers, remains a key question that this research seeks to explore.

In a recent AgritechNZ (2023), more than three-quarters of farmers surveyed were open to sharing data when it provided direct benefit, however half reported only sharing data when required by regulation or other obligations. This highlights a tension between desire and action, farmers may be willing in principle, but hesitant in practice.

It appears Farmers love to share data - but there's a but. This research seeks to explore that "but." Specifically, it aims to understand the factors influencing farmers' willingness to share accurate on-farm event data, and what actions can be taken to foster a more supportive and trusted data-sharing environment.

2.Objective

The primary research question is:

Are dairy farmers incentivised to know about and share accurate on-farm event data, or do they prefer to present data that is favourable in the eyes of downstream customers?

To answer this research question, consideration will be given to the following:

- Consumer expectations influencing New Zealand Dairy incentive programs.
- Farmers operating obligations from industry and regulatory bodies.
- Future expectations of industry and regulatory bodies.
- Farmer uptake and adoption of existing and emerging technologies.
- Key motivators for farmers when adopting IoT technology.
- How comfortable farmers are with sharing data with downstream data customers.

3. Literature Review

This literature review explores the existing research and industry insights relevant to the central question of this study: *Are dairy farmers incentivised to know about and share accurate on-farm event data, or data that is favourable in the eyes of downstream consumers?* The review draws on academic literature, industry reports, regulatory documents, and agribusiness thought leadership. It is structured around six core themes: (1) evolving consumer and market expectations, (2) incentive structures and behavioural Influence, (3) technology adoption and farmer motivations, (4) attitudes toward data sharing, (5) trust, control, and data governance, and (6) Kaitiakitanga or guardianship, protection and stewardship of the natural environment.

3.1. Evolving Consumer and Market Expectations

A critical part of product development is understand consumer expectations (Power, 2024; Maulidah, 2017) and generate solutions that meet market needs. To help contextualise this view, methods such as the Quality Function Deployment (QFD) for product design and development are important. Hunt (2003) discusses the evolution of this method as it enhances product and service quality through stakeholder-focused processes.

New Zealand's reputation for high-quality, sustainable, ethically produced dairy products is increasingly linked to its ability to provide credible, verifiable on-farm data. McKinsey & Company (2019) found that younger consumers, particularly Generation Z, are willing to pay a premium for products demonstrating environmental and ethical responsibility. A 2023 study conducted by Deloitte, highlights groceries/food as being the largest category of a sustainable purchases (figure 1). Furthermore, Forbes (2024) reported that there is "…growing emphasis on sustainability, conscious consumption, and ethical practices,…Companies that can adapt to these changing preferences and demonstrate a commitment to environmental and social responsibility are likely to thrive in the long term.". This suggesting there is benefit in moving ahead of large-scale consumer demand. These values are mirrored by multinational brands such as Nestlé and Mars, who now expect dairy exporters to provide transparency and verification around sustainability metrics (*Sustainability at Nestlé | Nestlé New Zealand*, n.d.) (*Policies & Practices | Mars Global*, n.d.) because of their commitments to consumers to reduce climate impacts.

Category of consumers' last sustainable purchase

Among 46% of survey respondents who purchased a sustainable good or service within the past month …

Groceries/food 35%	Household goods 28%	Transportation 8%	Home furnishing and appliances 5%	Beauty and personal care 5%

Fresh foods 23.8% — Packaged foods 5.3% — Frozen foods 2.8% — Other foods 1.0% — Beverages 1.4%

Paper products 9.2% — Laundry products 8.1% — Kitchen items 4.5% — Cleaning products 4.5%
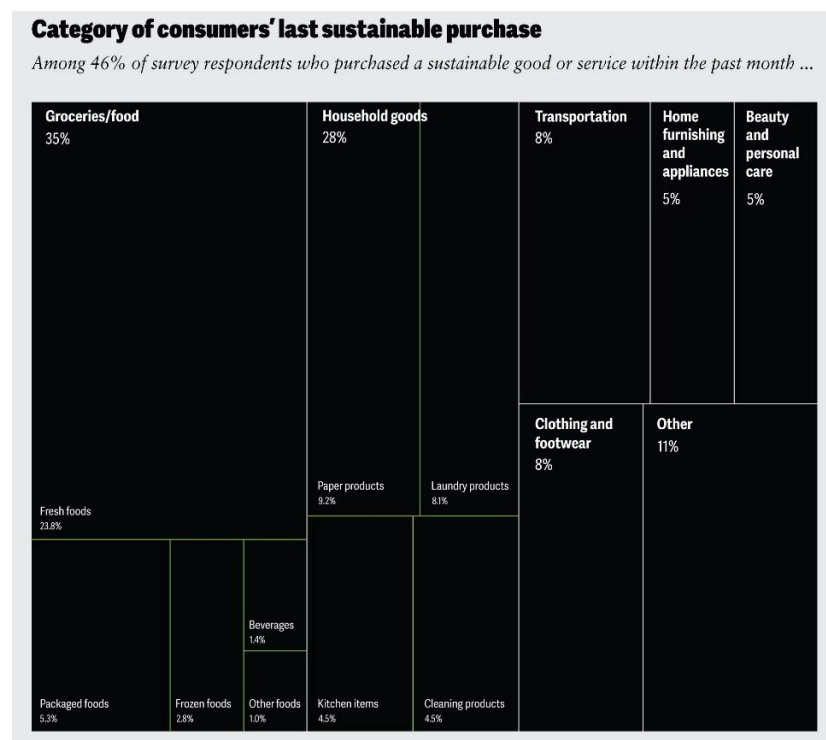
Clothing and footwear 8% — Other 11%

Figure 1 – Category of consumers' last sustainable purchase (Deloitte, 2023)

New Zealand milk processors have responded with market access programmes such as Fonterra's *Co-operative Difference Framework* (Fonterra, n.d.), Synlait's *Lead With Pride* (Synlait, 2024), and Miraka's *Te Ara Miraka* (Miraka, 2024). These frameworks emphasise four core pillars: animal health and welfare, environmental stewardship, milk quality, and social responsibility. These initiatives rely heavily on farmer-supplied data to substantiate claims and differentiate New Zealand dairy in global markets.

Within the New Zealand market, independent milk produces like Dreamview Creamery are accessing premium markets through their positioning as an environmentally friendly and ethically conscious choice (*Home | Dreamview Creamery*, n.d.). Whilst ethical practices like animal wellbeing standards and environmental practices are front and centre to their market claims, they go as far to say how many plastic bottles have been saved using their reusable glass bottles. When compared to the standard supermarket prices of milk, Dreamview accesses a market premium of 32%.

3.2. *Incentive Structures and Behavioural Influence*

A range of literature explores how incentives, both financial and non-financial, can influence the accuracy and nature of data disclosed ((Foong et al., 2003) (Rathje et al., 2023)). Gneezy et al. (2018) demonstrate that individuals may be inclined to selectively report data when directly liked to outcomes, especially when there is fear of judgement or loss of financial reward. This tension is relevant in farming contexts where milk quality incentives, environmental incentives, or reputational risks are tied to data reporting.

In the New Zealand dairy industry, processors such as Tatua and OFI offer up to $0.20/kgMS for compliance with premium market standards, especially in areas such as animal welfare and environmental performance (Tatua, n.d.; OFI, n.d.). The structure and transparency of these incentives play a critical role in shaping whether farmers feel motivated to report accurately or selectively.

3.3. *Technology Adoption and Farmer Motivations*

Technology uptake among New Zealand dairy farmers has grown significantly, particularly in areas such as herd monitoring, in-shed automation, and remote sensing (Figure 2; DairyNZ, 2023). AgritechNZ (2023) reports that 59% of primary industry respondents are inclined to adopt digital tools, though adoption is highest where technologies offer immediate and visible benefits, such as time-saving automation.
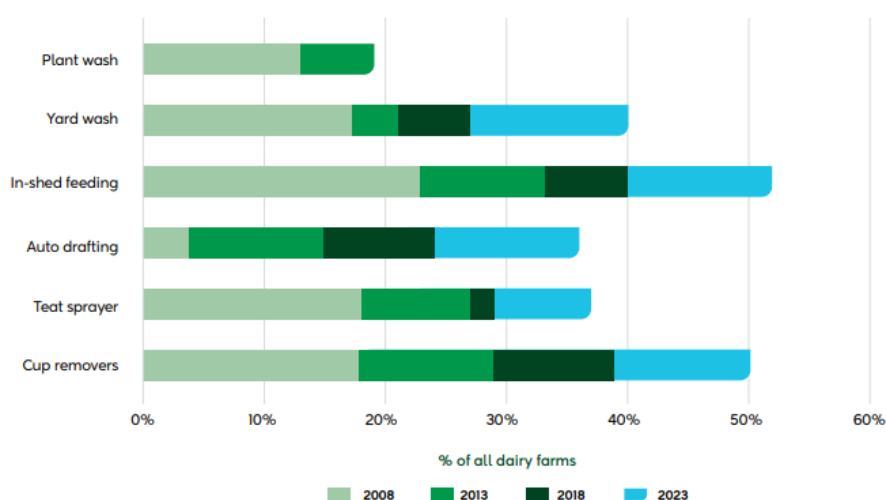

Figure 2 – Total automation technologies on all farms surveyed in 2023. (DairyNZ, 2023)

Farmers tend to adopt technology when it aligns with practical needs and delivers tangible value. According to the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model (Figure 3; Venkatesh et al., 2012), technology adoption is driven by expected performance gains, ease of use, social influence, and enabling conditions. Tools like automated drafting gates or heat detection wearables, for example, align closely with the "make/save/comply" motivations observed in this research.
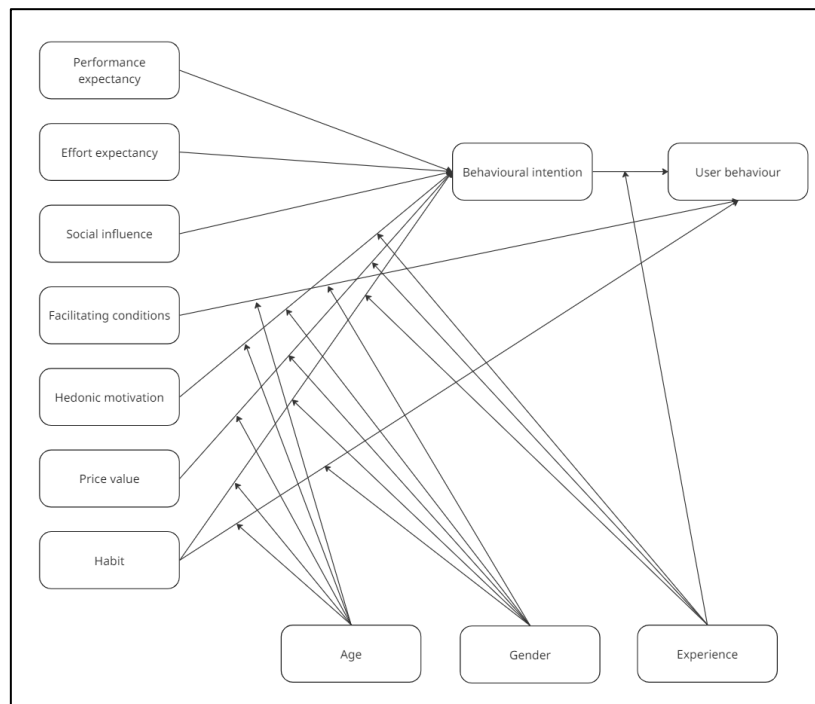
Figure 3 – Visualisation of the UTAUT2 (modified from Venkatesh et al., 2012)

While adoption of technology across the agriculture sector is gaining momentum, farmers are spending time in multiple applications for a wide array of jobs on farm (Williams, 2016). Bryant (2024) discusses the need for data to be structured and accessible otherwise farmers "will be frustrating and you'll resort to guesswork.". Agri-tech firms are making progress which is highlighted by 70% of Fonterra's Farm Dairy Records able to be prepopulated through integration with several partners (Stringleman, 2025).

3.4. Attitudes Toward Data Sharing

Farmers are generally open to data sharing when they retain control and understand the value exchange. Pryor (2019) suggests that with increasing digital transparency, "the factory has no roof," and farmers can no longer hide from remote data collection. However, this visibility raises concerns that data could be used to penalise rather than support, especially where context is missing. Douma (2023) similarly argues that while data is key to market access, farmers remain cautious about how it is interpreted and whether they are given the opportunity to explain anomalies. This caution reflects a broader issue of data ethics, control and sovereignty. Pryor (2019) reports that farmers are more comfortable sharing data when it results in productivity gains or simplified compliance. However, they are wary when data is required for audit or regulatory purposes particularly if the value back to the farmer is unclear.

3.5. Trust, Control, and Data Governance

Trust and control are prerequisite to a functioning agricultural data ecosystem. Wolfert et al. (2017) and Wiseman et al. (2019) argue that farmers must retain control over their data and be provided with transparent governance mechanisms. In New Zealand, platforms like LIC's *MINDA* and Fonterra's *FarmSource* have introduced a "managed connections" feature to allow farmers to explicitly authorise data access and give greater levels of transparency on

data exchanges. LIC has taken the next step to make specific details of what data is shared and with whom available in a dedicated webpage (*MINDA Integrations | LIC*, n.d.)

Roeber et al., (2015) suggest that context and role clarity is critical in encouraging data sharing. Consumers are more likely to share data with organisations who are perceived to have legitimate, relevant use for it. Furthermore, Bernal (2024) argues that data sharing is limited because of a fear that third parties could use data for purposes not agreed upon which damages the consumer or business.

3.6. *Kaitiakitanga*

Opai (2021) claims: " ... from any culture, regional variations will occur. Māori tikanga reflects a fascinating worldview, filled with intricacies of a multi-layered, thoughtful society that has had some hard lessons in survival from the past and is evolving into a positive future." (p.151). For the dairy sector it is essential that the fundamental elements of Kaitiakitanga provide a guide to understand how the environment might be managed. This will not only benefit the land and broader environment but also align to consumer demands and determining farmer operating obligations for data sharing. Future research that informs farming practice needs to incorporate Kaitiakitanga so as to incentivise stakeholders in the sharing of essential data and demonstrating appreciation of tikanga.

3.7. *Literature Gaps and Research Contribution*

While literature addresses themes such as data ethics, adoption barriers, and incentive alignment, few studies explore the tension between *favourable* versus *accurate* data disclosure in a New Zealand dairy context. This research contributes firsthand evidence by directly comparing the perspectives of farmers, milk processors, and agri-tech firms. Furthermore, it introduces a new conceptual model, the "make/save/comply" framework and applies the coaching team analogy to improve communication and alignment across the data value chain.

4.Methodology

4.1. Defining downstream consumers

For the purposes of this research, *downstream consumers* are defined as any stakeholders with an interest in on-farm data. This includes, but is not limited to:

- Milk processors

- Regional and central government agencies

- Agribusinesses that support farmers

- Financial services providers

These groups influence or are influenced by how farm data is collected, interpreted, and used.

4.2. Data collection

This study employed a qualitative research design using semi-structured interviews to explore the motivations and barriers influencing data-sharing behaviour among dairy farmers. The research includes interviews with milk processors and agri-tech firms to understand the broader data ecosystem and downstream expectations.

4.3. Participants and Data Collection

i. Dairy Farmers

Five interviews were conducted with dairy farmers to explore their willingness to share on-farm data and the motivations underpinning their decisions. Participants were selected to ensure a mix of advocates and detractors, based on prior professional interactions. Interviews were conducted either in person or via Microsoft Teams and were recorded for transcription and thematic analysis.

ii. Milk Processors

Three interviews were conducted with representatives from milk processing companies to understand how consumer expectations are reflected in their incentive programmes. Participants were selected to represent a cross-section of the industry: a large cooperative, a Māori-owned enterprise, and a newer market entrant. Interviews were conducted either in person or via Microsoft Teams and were recorded for transcription and thematic analysis.

iii. IoT and automation device suppliers

Seven interviews were conducted with representatives from IoT and automation device suppliers to understand the market, value proposition and their perspective on data sharing. Participants have been selected to cover a range of technologies such as wearables, optical image recognition devices and in shed automation technologies. Interviews were conducted either in person or via Microsoft Teams and were recorded for transcription and thematic analysis.

4.4. Data analysis

The collected data was qualitative in nature with results examined using thematic analysis. Thematic analysis is a method for identifying, analysing, and reporting patterns within data (Braun & Clarke, 2006). Microsoft Copilot (GPT-4) was used to assist in summarizing themes from qualitative interview transcripts. The tool helped identify recurring patterns and supported thematic analysis, but all interpretations were reviewed and validated by the researcher.

4.5. Ethical considerations

An initial research proposal was submitted to Dr Craig Trotter. This provided assurance that necessary ethical considerations were taken into account. The information provided to

participants and the semi-structured interview questions can be found in the Appendix. The questions were reviewed by Dr Trotter prior to the interviews.

Participants were identified as "Respondent A" through to "Respondent P". Primary data was stored securely.

5.Findings

5.1. Overview

Sixteen interview participants where asked a series of questions focused on their perspectives on data sharing, alignment to incentive programmes and data accuracy. These respondents comprised:

- Four representatives from milk processors
- Seven representatives from agri-tech firms
- Five farmers

Participants were asked questions tailored to their role within the industry. Some participants were sharing their personal views as well as perspectives of the companies they work for.

Key themes were identified from interviews of the three interviewee types which are detailed below.

5.2. Summary of Interviews with Milk Processors

Interviews with professionals from milk processors acknowledged the need to improve communication with farmers about what data is needed for and the benefits to farmers. A reoccurring theme was the desire for compliance not to be seen as a stick but rather a way to substantiate market claims and support the narrative around the New Zealand dairy industry. Building trust and giving farmers control were identified as key enablers to gaining greater buy-in, adoption and removing friction.

i. Evolving Consumer Expectations

Over the past 5–10 years, consumer expectations have shifted significantly, particularly towards environmental sustainability and health-conscious products like protein-rich milk. There is a growing demand for ethical, environmentally sustainable, high animal welfare, and traceable products. While there has been a shift, expectations of consumers were varied, particularly by age. It was suggested commodity buyers are anticipating emerging consumer trends and therefore demand is primarily driven by these corporate customers, especially by the likes of Nestlé, Mars and Starbucks rather than end consumers *per se*. The focus is on greenhouse emissions, animal welfare, and regenerative agriculture so consumer products can be positioned and marketed at a premium.

ii. Incentive Programmes as Change Agents

All processors recognize the value of incentives to align farm practices with market demands. Some have structured programmes, while others are more cautious but see potential. Farmers are incentivized both financially and through strategic signalling. Some programme uses incentives to nudge farmers toward future regulatory or customer expectations, however financial incentives must be meaningful to drive real change, with the "carrot" approach being used to encourage sustainable practices. There is consistency between milk processors with programmes generally structured around pillars - Environment, People, Animals, and Milk - with both mandatory and incentivized standards. The incentive programmes have evolved to tighten definitions and reduce loopholes where farmers might present favourable but incomplete data.

iii. Data Sharing

Farmers are increasingly engaged in data recording, but trust varies. Traditionally this has been farmers transposing data into a portal or form, but API data sharing is becoming more common. There is a need to work on transparency, control, and value return for farmers. Some processors are trying to reduce the burden of data collection through automation, but automation doesn't necessarily mean more data is shared. The same questions are being

asked irrespective of the input being a farmer or an API, just that it's easier to share what's already required.

iv. Data Accuracy

While farmers are encouraged to share accurate data, there is a natural tendency to highlight favourable data, especially when incentives are tied to performance. Some processors acknowledged that farmers might share data that reflects well on them, particularly when they fear negative consequences from sharing less favourable data. While specific cases of poor outcomes for farmers are hard to find, there is acknowledgement that this is a genuine fear which needs to be carefully managed. One interviewee recalled instances of banks and councils accessing data which was then used to impose premature requirements.

v. Farmer Motivation and Behaviour

Farmers are motivated by financial gain, simplified regulatory compliance, and values alignment. Smaller processors benefit from values-based recruitment and closer persona; relationships, which enhance programme uptake. Larger processors focus on past performance and long-standing relationships with farmers and the industry. Some suppliers select farmers based on values alignment, leading to a greater willingness to share accurate data, not just favourable data. There has been some hesitation from farmers noted by processors, largely there is an understanding data sharing is required.

vi. Value, Control, and Trust

Farmer willingness to share data is dependent on retaining control, a clear purpose, and financial and non-financial benefits returned (e.g., insights, incentives). Some farmers still opt out of sharing certain data or participating in incentives due to time constraints or scepticism about the value. Emphasis is placed on farmer ownership of data, transparency, and managed connections. Trust is easily broken if data is used to enforce compliance rather than support improvement. Past experiences where data was used against them (e.g., by auditors, banks or councils) can lead to selective sharing or withholding of data. Processors aim to build and maintain trust through transparency, communication, and farmer-centric systems. Trust-building includes clear communication, training, and data-sharing agreements. Farmers are more willing to share data when they have clear control over what is shared, with whom, and why. Consistent communication, returning insights to farmers, and showing how data supports better pricing and customer relationships are crucial. Trust is built through close relationships and proactive engagement to identify and support farmers, avoiding overreach by adapting based on feedback.

vii. Role Clarity and Industry Collaboration

Processors find themselves in a challenging role where they are required to support but, in a way, regulate farmers. There is a shared recognition that industry collaboration is needed to avoid duplication, confusion, and overreach when discussing specific areas for improvement on farm. Some processors emphasized the need for clearly defined lanes, partnerships with agri-tech and advisory services. Balancing support versus overstepping is crucial, with some processors lacking clarity on their role and the need for better industry coordination.

viii. Kaitiakitanga and environmental stewardship

Processors acknowledged that environmental protections do play a critical role in differentiating products currently and will likely becoming increasingly important in the future. Data to substantiate market claims will play a significant role in supporting the narrative about New Zealand's pasture based, ethical and environmentally friendly production system. It was noted by one processor that environmental stewardship and Kaitiakitanga is particularly important to their cultural and business values so much so that environmental criteria were built into their incentive program. There is a belief that they had an obligation to protect and

preserve the natural environment for future generations through supporting farmers to improve their practices and standards.

5.3. Summary of Interviews with Agri-tech Firms

Interviews with professionals from agri-tech firms revealed a nuanced understanding of the incentives and barriers that dairy farmers face when it comes to sharing on-farm event data. A recurring theme was that farmers are primarily driven by three core motivations: the desire to make money through productivity gains, to save money by improving efficiency and reducing duplication, and to comply with regulatory or processor requirements - "make/save/comply" framework. However, it was noted that for these incentives to be effective, they must be both tangible and immediate.

i.   *Trust and control*

Trust and control emerged as critical factors influencing farmers' willingness to share data. Farmers working with these Agri-tech firms consistently expressed a desire to retain control over what data is shared and to whom, to understand how it will be used, and to have clear consent processes in place. Strong interpersonal relationships and transparent communication were called out as being critical to build this trust, while others suggested mutual data sharing showed farmers the benefits of the sector working together to support mutual customers. It is critical to remove the possibility of unauthorized third-party access to farmer data.

ii.   *Data accuracy*

When it comes to data accuracy versus favourability, interviewees acknowledged that farmers may underreport or selectively report certain events - such as lameness or mastitis - if they fear negative repercussions. This is observed as farmers avoid recording minor issues to remain within perceived acceptable thresholds. Some have had success in gaining accurate data by presenting insights as trends or benchmarks rather than raw figures taking away some concern of specific data points. Benchmarking was seen as a valuable tool when done for the right purpose and in the right context. It can allow for comparison without judgement however the ability to compare similar operations can be a real challenge when considering farm topography, location, system, animal breed, irrigation system and many more factors.

iii.   *Farmer views*

Farmers' willingness to share data was generally high when there was a clear benefit, such as productivity improvements, reduced workload or improved decision-making – "make/save/comply". Where there was a high level of trust in the platform and benefits were clear to farmers, this significantly increased openness. However, this willingness diminished when data could be shared with for regulators or processors, especially if there was a fear of penalties. Furthermore, farmers are more hesitant when the value proposition of sharing data is unclear.

iv.   *Agri-tech firms role*

The role of agri-tech firms was seen as pivotal in shaping data-sharing behaviours. Successful firms were those that provided tools and insights without being prescriptive or judgmental. This is done by empowering farmers through layered insights rather than directives. There is heightened importance of empathy and farmer-led development given the living ecosystem that farmers operate in. Often there are factors which are out of the farmers control which impact decision making on farm which without context, can be misleading. Agri-tech firms have a role in telling this story on behalf of farmers.

v.   *Interoperability*

Interoperability and integration were also key concerns. Farmers expressed a strong preference for systems that allow data to be entered once and used multiple times, with no duplication and seamless communication between platforms. There is an industry issues with

disparate data definitions and high data quality. EU regulations are increasingly mandating open APIs to facilitate this however New Zealand has some way to go in this regard.

vi. *What's ahead*

Looking ahead, AI and predictive analytics are expected to play a significant role in the evolution of Agri-tech solutions on farm. Transforming raw data captured by on farm technology and surfacing actionable insights to farmers will play a big part in delivering value to farmers. There is a clear focus on the importance of designing tools that support long-term compliance and market access.

Finally, while core motivations were broadly consistent, cultural and regional differences shaped how data-sharing technologies were adopted. One interviewee highlighted variations across Europe, the US, and the Middle East, and while another noted specific concerns in the Netherlands, such as the sensitivity around data to support cows access to pasture.

5.4. Summary of Interviews with Farmers

Interviews with farmers highlighted a high level of willingness to share data where they felt in control of who could access the data, what it would be used for and there was benefit received in exchange for the data. Technology was seen as a key productivity tool used to validate observations rather than generate significant new insights which were then able to streamline on farm processes such as mating, animal health and pasture management.

i. *Technology Adoption and Use*

Largely the farmers interviewed had adopted various technologies on farm although the described themselves as "second wave" adopters rather than leading the way. Typical technology on farm included personal GPS systems, cow wearables, automated draft gates, moisture monitoring tools, precision irrigation and fertiliser application, vat monitoring systems, and automatic weighing. Beyond physical technology, the adoption of web and mobile applications was significant with herd management and satellite pasture monitoring being common. Despite adoption of technology throughout most facets of their farms, there was emphasis on technology being a support tool, not a replacement of human observation. Technology is largely seen as taking away some of the administrative efforts leaving the decision-making to farmers. Importantly, many remain cautious about adopting new systems unless there is a clear return on investment.

ii. *Data Accuracy and Management*

Data plays a central role in the farmer's decision-making, compliance, and corporate reporting. While there is emphasis on keeping records up to date and accurate, at times, this is challenging and where technology has supported. While technology supports farmers, it was stressed that its effectiveness is closely dependent on the user's understanding of farming best practices and diligence. One example given was around herd testing which for some is seen as a confirmation tool rather than a primary source of decision-making. Integration between platforms remains a persistent frustration, often leading to duplication and inefficiencies. Nevertheless, there is commitment to maintaining high data quality and transparency, particularly given the accountability required by milk processors and corporate entities in some instances.

iii. *Attitudes Toward Data Sharing*

Farmer are generally open to sharing data, provided there is a clear benefit, and the data is used for the right purposes. Data is shared with a range of third parties, including herd management software providers, genetics companies, milk processors, and consultants. However, permission-based sharing is important so that farmers retain control over how and when data is used. There is greater comfort sharing anonymized data for the broader good of the industry but are more cautious with identifiable data unless it contributes to meaningful

improvements. There is a view that there should be the ability for systems to integrate to reduce duplication and manual entry.

iv. Privacy and Control

While farmers express some concern about data ownership and transparency, primarily the focus is on the need for stringent security and privacy processes. Farmer control with who has access to their data is seen as a must have. There needs to be a high level of trust with those who have access to data because data is entered into external systems, control is often lost, likening it to the trade-offs seen in broader tech ecosystems like Google versus Apple Maps. Interestingly, there is a belief that openness and accountability are responsibilities that come with expecting integrated systems. However, there is recognition that some farmers may be reluctant to share data due to fear of judgment or misinterpretation. One such fear is that context is crucial in understanding why decisions have been made - data without explanation can be misleading, especially when comparing farms across different regions or systems.

v. Trust and Relationships

Trust is a critical factor in farmer's willingness to share data. There was much more openness to share with companies that have a direct relationship with their farm or offer clear, tangible value. There is scepticism of one-size-fits-all metrics and believes that industry incentives often favour large, flat, irrigated farms, potentially disadvantaging others. Data-sharing opportunities are generally evaluated based on mutual benefit, whether operational, strategic, or financial, and prefer to work with third parties who have a proven track record of ethical data use.

vi. Perception of Industry Intentions

Farmer views of industry stakeholders differ greatly depending perceived motivations. While there is generally trust of agri-tech firms and industry bodies, some remain cynical about the commercial motives of agribusinesses, viewing many as more sales-driven than support-focused. There is significant frustration by the poor execution of compliance tools, which are found to be burdensome and ineffective. Nonetheless, there is belief that most in the industry have good intentions and that bad actors are unlikely to last due to reputational risks. There is appreciation for the support provided by organizations supporting with herd improvement and milk processors, there is some feeling that large milk processors can overstep into areas better handled by other advisors. Ultimately, farmers believe that even underperforming farms can benefit from shared data and external feedback in terms of supporting performance improvements, provided the systems in place are transparent, ethical, and contextually aware.

Interestingly, while past performance is preferred, it is not a necessity for some farmers. Farmers are willing to look at emerging technologies however only when there is a clear need and the return is sufficient particularly when others have already adopted the technology.

vii. Kaitiakitanga and environmental stewardship

A consistent theme throughout the interviews was farmers appreciation and understanding of the impact that farming can have on the land and environment. While some did not refer to it directly, the underpinning values of Kaitiakitanga were consistent in terms of long-term view to the protection and enhancement of the land they rely on to farm. While factors like region, topography and farm system mean each farm is unique, there was a desire to do the best they can to improve the environment. The use of technology like precision irrigation and fertilizer application were seen as options to improve. Incentive schemes are continuing to encourage focus on environmental stewardship which many mean additional technologies are more accessible and further data maybe needed to substantiate market claims.

6. Discussion

This study set out to explore whether dairy farmers are incentivised to know about and share accurate on-farm event data, or whether they are more inclined to share data that is favourable in the eyes of downstream consumers. The findings from the interviews with farmers, agri-tech business and milk processes were supported by the review of literature and reveal a nuanced landscape shaped by trust, incentives, and evolving consumer expectations.

6.1.   Summary

Farmers are largely comfortable to share data when their foundational needs are met, many of their secondary needs are met and importantly, there is tangible benefit for the farmer. A simple framing for benefits identified through this research is the "make/save/comply" framework. Beyond a tangible benefit although linked, willingness to share data is correlated to a farmer's ability to understand why the third party has requested the data – does the third party have a rational need for this data in the context of the relationship the farmers believe they have.

Primary needs

- Data security
- Farmer control
- Support systems
- Trust of third parties
- Transparency

Secondary needs

- Mutual data sharing
- Integrity
- Past performance
- Understanding and empathy

Benefits

- Make - the addition of something to a farm or farmers life
- Save - the removal of something from a farm or farmers life
- Comply - the base level requirements to operate

Where the above requirements are not met or communication is not clear, farmers are more likely to be hesitant to share their data. This is particularly likely when there's a lack of understanding of what data is going to be used for by the farmers, particularly when parties are understood to be unemphatic and farmers lack the ability to provide context.

Interviews across all participants suggested the comply element is the most controversial and can cause angst among farmers. Again, communication appears to be a strong driving factor for this concern.

6.2.   Make/save/comply framework

Benefits are personal to each farmer however there will likely be a combination of financial, intrinsic motivators and cultural alignment. A common way of describing value is through the "Make/Save/Comply" framework which has been developed as a result of this research. While this a simplistic view, there is merit in assigning benefits in this way due to an ease of communication and alignment to farmers thinking. Some agri-tech firms are already thinking in this way when talking about the benefit of their products.

Despite its simplicity, each category within this framework can be very broad and will be personal to each farmer. Below are some examples of these benefits in no particular order and by no means is this an exhaustive list.

Make
- Increased milk production
- Access to incentive schemes
- Access to premium markets
- Herd improvement and genetic gain
- Capital optimisation
- Kaitiakitanga
- All elements of Te Whare Tapa Wha

Save
- Reduction in on farm costs
- Access to cheaper lending
- Access to grants
- Reduction in vet bills
- Reduction in machinery cost

Comply
- Access to and compliance of resource management plans
- Some elements of milk processor supply agreements
- Legislative requirements

Interviews across all participants suggested that the comply element is the most controversial and can cause angst among farmers (Figure 4). Further to this point, at times, requirements are assumed to align with comply however are related to one of the other benefit categories. As an example, a farmer qualifies that meets specific criteria to gain access to an incentive scheme which is over and above the base supply agreement, this is no longer a compliance obligation and now is aligned with 'make'. If communicated in this way, farmer willingness to share data may change.
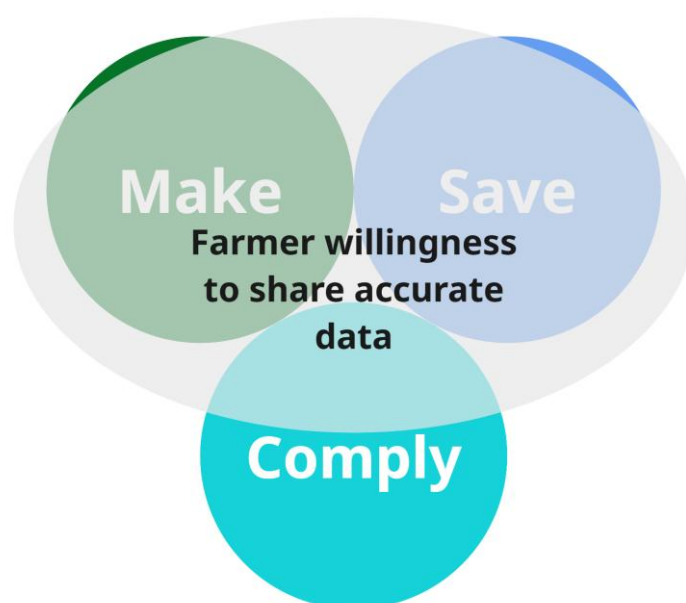

Figure 4 – Summary of Make/Save/Comply framework

6.3.   Evolving Consumer Expectations

Expectations have shifted significantly in recent years towards environmental sustainability, health-conscious products, and ethical practices (Deloitte, n.d). In the view of interviewees, this shift is driven by corporate customers rather than end consumers at this stage however market research does suggest younger generations are making buying decisions based on ethical factors. Milk processors and agri-tech firms recognize the importance of aligning farm practices with these evolving demands, focusing on greenhouse gas emissions, animal welfare, and regenerative agriculture. Farmers are equally aware of expectations on environmental and ethical practices however often see this as corporate consumer expectations and disconnected from end consumer expectations.

6.4.   Incentive Programmes as Change Agents

Broadly there is acknowledgement that particularly financial incentive programmes do align farm practices with market. These programmes often use financial incentives and strategic signalling to encourage sustainable practices. Incentives are seen as a catalyst for change however they do not a guarantee on farm processes will change. Structured around pillars such as Environment, People, Animals, and Milk, these programmes require data to substantiate market claims. Whilst data is often farmer input, there are auditing processes to validate this data where practical. Effort has been put into tighten definitions and reduce loopholes where farmers might present favourable but incomplete data.

Across all three processors, financial incentives were identified as a primary motivator for data sharing. However, the significance and structure of these incentives meaningfully influenced farmer engagement. Some milk processors offer up to $0.10–$0.20/kgMS for meeting specific environmental, animal welfare, and milk quality standards. These incentives were seen as effective in encouraging farmers to record and share data with the processor.

In contrast, another processor has not yet implemented direct financial incentives. While farmers are expected to meet regulatory and quality standards, the absence of strong financial drivers means that data sharing is often seen as a compliance task rather than a value-adding opportunity. This has resulted in bear minimum data sharing and opportunity for targeted on farm change.

The presence of financial incentives clearly plays a role in encouraging data sharing. However, the effectiveness of these incentives depends on their perceived value - incentives that are too small may provide a positive return on investment and be overshadowed by other operational priorities. This aligns with existing literature suggesting that economic incentives must be substantial and clearly linked to outcomes to influence farmer behaviour (Läpple & Kelley, 2013). When considering the role of data sharing in incentives, ease of sharing and targeted to predefined outcomes is critical.

Interestingly, other milk processors combine financial rewards with values-based onboarding for supplying farms which suggest that intrinsic motivation and cultural alignment may be equally important. This supports the idea that a blend of extrinsic and intrinsic motivators is most effective in driving behavioural change (Deci & Ryan, 2000).

6.5.   Data Sharing Is Evolving but still burdened by complexity

All processors acknowledged that automated data sharing via APIs is improving efficiency, but it does not necessarily lead to more data being shared. Farmers still weigh the effort, risk, and perceived benefit of sharing each data point. The burden of compliance is acknowledged and understood by milk processors. Some have gone so far as to say, only data which can be sourced via an automated means will be requested over and above what

is currently required - unless they can be automated or clearly justified, new data will not be required.

While progress has been made in recent years, the fragmentation of systems and lack of integration across platforms continues to be a barrier. This is not just for milk processors but more broadly across all firms in the agriculture sector. Those interviewed expressed a strong desire for industry-wide collaboration to reduce duplication in order to streamline data flows.

Farmers are increasingly engaged in data recording, but trust varies. Transparency, control, and value return are crucial for farmers to feel comfortable sharing data. Automation is seen as a way to reduce the burden of data collection, although it doesn't necessarily mean more data is shared - just that it's easier to share what's already required.

All milk processors acknowledged that while digital tools and APIs are making data sharing easier, this does not necessarily translate into more or better data. Farmers remain cautious, and the fragmentation of systems continues to create friction. This reflects broader challenges in the agri-data ecosystem, where interoperability and standardization remain unresolved (Wolfert et al., 2017).

To contrast this, farmers appear to be very comfortable with sharing accurate on farm data when it comes to enabling features offered by agri-tech firms. In most cases these agri-tech firms are discretionary technologies adopted to improve on farm performance meaning farmers are able to relate the request for data back to a direct benefit to them – make or save. While sharing of data is commonplace, there is a still a lack of data infrastructure to support automation meaning that farmers bear the brunt of transposing data between different platforms manually. There are several examples of the agri-tech firms beginning this journey such as LIC's MINDA Integration product, however significant progress is needed to be made so that farmers are able to take full advantage of these technologies.

The desire for a more integrated, farmer-centric data infrastructure highlights a need for industry-wide collaboration. Without this, the burden of data management may continue to fall disproportionately on farmers, undermining both accuracy and participation.

6.6. Trust and control are critical to accuracy

A recurring theme across the interviews was the importance of trust in data sharing and ultimately in ownership of data. This finding echoes previous research highlighting the role of trust in technology adoption and data governance in agriculture (Wiseman et al., 2019).

Interview participants emphasized that trust is a prerequisite for accurate data sharing. Farmers are more likely to share complete and truthful data when they:

- Understand how the data will be used.

- Retain control over what is shared and with whom.

- Receive value in return, such as insights or incentives.

- Have an opportunity to provide context where they believe there is a need.

While examples of misuse of data are rear, one milk processor recalled instances of banks or councils using environmental plans to impose premature requirements. Examples like this may led to hesitancy and selective sharing among some farmers. In response to farmer concerns, some third parties have developed a "managed connections" platform, requirement for explicit farmer consent before data will be shared. This shows real-time status of connections and gives farmers the ability to revoke this access. In an attempt to further strengthen trust with farmers, Agri-tech firms have developed data-sharing agreements that reinforce farmer ownership and transparency.

Farmers are more willing to share data when they retain control, the purpose is clear, and there is value returned (e.g., insights, incentives). Trust is easily broken if data is used to enforce compliance rather than support improvement. Past experiences where data was used against them can lead to selective sharing or withholding of data. Agri-tech firms are a good example where they build and maintain trust through transparency, agreements, and farmer-centric systems which deliver value back to farmers. One milk processes have consciously approach data use cautiously, specifically avoiding regulatory enforcement, which further illustrates the delicate balance between support and surveillance.

Data ownership remains a key topic with the participants. With industry third parties developing managed connections platforms and data-sharing agreements there is growing industry recognition that data sovereignty - the principle that farmers own and control their data - is essential for long-term engagement.

While a track record of performance is favourable, some farmers did show a willingness to utilise technologies which are new to market but only if operating impact was minimal and there was a clear return on investment. This shows farmers considered early adopters (Roger, 1995), are looking for emerging solutions to tackle immediate problems and fostering innovation within the industry.

6.7.   Favourable vs. accurate data: a subtle tension

There is real variability when it comes to favourable vs. accurate data particularly when it comes to which party is making the request.

Put simply, this comes back to the make/save/comply framework. If the party requesting data is supporting farmers make or save, accuracy is likely to be higher. If the data is required for compliance, farmers may still be inclined to share data that reflects positively on their operations particularly when incentives or reputational risks are involved. This aligns with behavioural economics literature on self-presentation bias and strategic disclosure (Gneezy et al., 2014).

Interestingly, a smaller milk processor noted that farmers may "opt out" of certain standards if they feel they cannot meet them or if the data might reflect poorly. This is particularly true for standards that are over and above the base requirements within processor supply agreements. Whilst this is an option which farmers may choose, by in large the values-aligned supply base appears to mitigate this risk. Their close relationships and transparent communication foster a culture where accuracy is normalized and rewarded, rather than penalized.

"We've never done anything bad with (the data) … so they're like, 'Now I just trust you.'" (Respondent E)

While not a primary focus of this research, farmers suggested this sentiment also applies to councils and central government.

6.8.   Role Clarity

Agri-tech firms and milk processors are navigating their roles between supporting farmers with insights and pointing out where practices are having negative impacts on animals and the environment. There is a shared recognition that industry collaboration is needed to avoid duplication, confusion, and overreach however there is need for improvement. Clear lanes and partnerships between agri-tech companies, milk processors and advisory services are emphasized to balance support versus overstepping.

Farmers are at times questioning why third parties require data which doesn't easily relate to the value which farmers believe the partner delivers to them on farm. This is particularly felt

with milk processors whereby data to support market claims is requested but at times not clearly communicated about the how this relates – the number of lameness cases over a period is a reoccurring example where there is confusion. There is a perception that if the number of cases is 'high', farmers could be punished or reprimanded in some way.

Processors are aware of this tension and are designing programmes to:

- Encourage transparency.

- Provide feedback and support.

- Avoid punitive use of data.

Smaller processors may have an advantage due to closer relationships and values alignment, which fosters more open data sharing.

Automation and integration can reduce friction but doesn't automatically lead to more or better data sharing, trust and perceived value remain key. Farmer willingness is intrinsically linked to the value each partner delivers and therefore requests for data need to relate to the third party's domain of expertise. If a partner can explain how the requested data will generate value for farmers, farmers are likely to be more willing to share that data with them.

6.9.   A novel framework for supporting farmers

This idea is similar to many facets of life not just farming. We are all requested to share data by any number of people or companies, and we make a judgement call as to whether we will share this based on the value it will deliver to us. When asked about allergies by a waiter, people are more than willing to share their nut allergy but if a mechanic asked for the same information when taking a vehicle in for a service, this information is unlikely to be shared.

Similarly for farmers, they are often supported by a team of experts across the industry. These experts could be farming consultants, equipment providers, genetics and herd improvement companies, milk processors and many more. These third parties support them in one or many domains which farmers see value in their products, services and expertise. Requests for data related to these domains are likely be accepted by farmers particularly where the aforementioned primary and secondary needs are met and benefit to the farmers is clear.

A simple analogy that can be applied is the way a sports person interacts with and gets support from a professional sports team (Figure 5). There are coaches focused on a specific game skillset, physical and mental health services, logistics and planning, and high levels of analytics, all focused on optimising the individual's performance. This can be applied to agriculture where people or companies support a farm, or farmer could be categorised as a specific coach and support function. Although each farmer and third party are likely to think about this differently, to showcase this concept, an example has been put together.
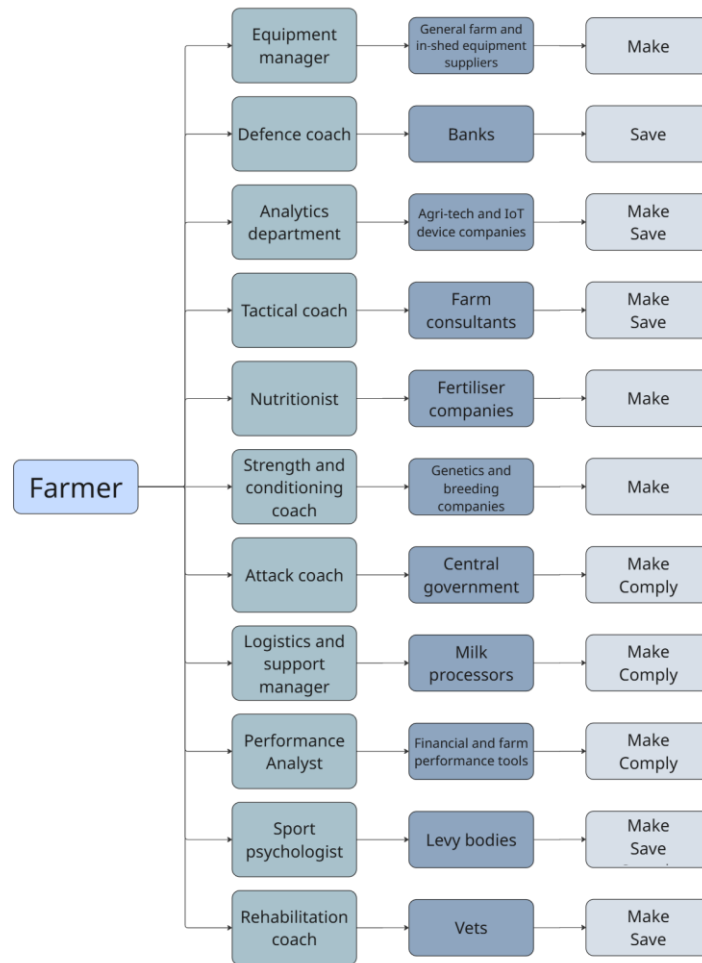
Figure 5 – Summary of Industry Coaching Analogy

There is an important point to clarify in the analogy. Companies and people can move between these roles based on the breath of their product and service offering and will naturally do so when supporting a farmer. However, the context in which conversations and subsequently requested data are framed need to be clearly positioned as it relates to the role they are performing.

As an example, a herd improvement company like LIC, may have a single conversation which covers strength and conditioning (genetics and breeding), analytics (animal recording and decision making) and tactical options (farm consultancy) through the services they offer farmers. Importantly, farmers need to know what kind of support they are receiving at that point in time so they can correlate the need for data and the benefit they will receive.

Another element that third parties need to carefully consider is the time horizon which they are focused on. Not all conversations are focused on the here and now, some third parties are focused on what could happen or be challenging decades into the future.

A simple key has been developed to highlight third party engagement levels over specific time horizons (Figure 6).
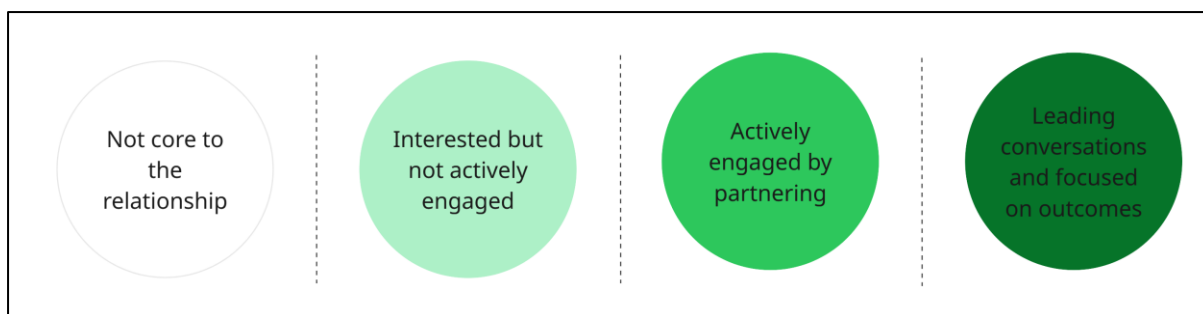
Figure 6 – Time horizon

When third parties engage with farmers and request data, to avoid any concern, it is not only important for them to focus on the coaching or support role but also the time horizon of the conversation.
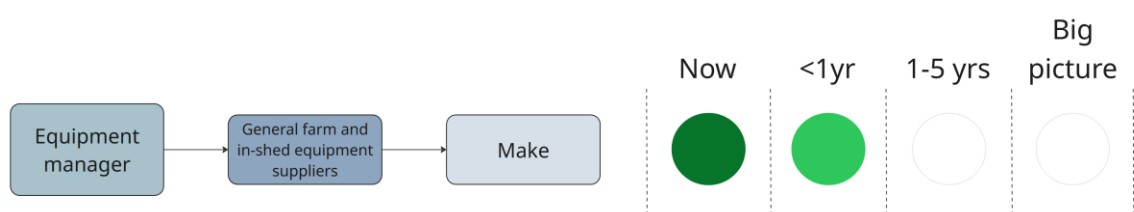
Equipment manager

Figure 7 – Time horizon – Equipment manager

Support provided to farmers is generally ensuring that they have the right tool for the right job. Data requested will likely be farm system, farm profile and attributes, stock or land use diversification and any major changes in the coming 12 months (Figure 7).

Defence coach

Figure 8 – Time horizon – Defence coach

Support provided to farmers is generally ensuring they have a strong financial basis for their business. They can operate and gain access to capital in the next 12 months with a view to 1-5 years (Figure 8).
Data requested will likely be farm goals, business plans, input cost, production output and stock numbers.
There is a growing focus on the environmental impact of business lending so this will likely lead to additional data request in future.
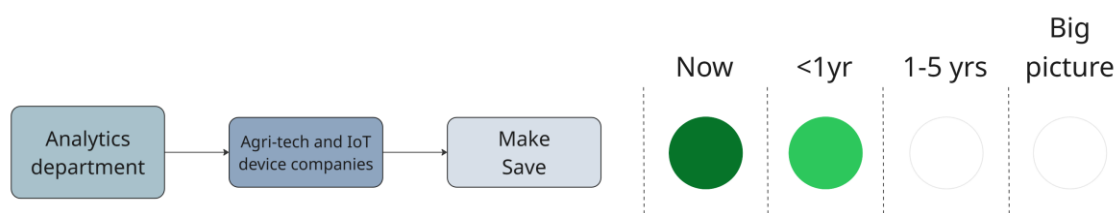
Analytics department

Figure 9 – Time horizon – Analytics department

Support provided to farmers is generally insights into the performance of the herd and farm through the use of 'Internet of Things' devices. Using advanced analytics techniques, actionable insights can be generated and surfaced to farmers.
Data requested will likely be detail animal records including health and genetic information, farm system, farm profile and attributes and milk production data.
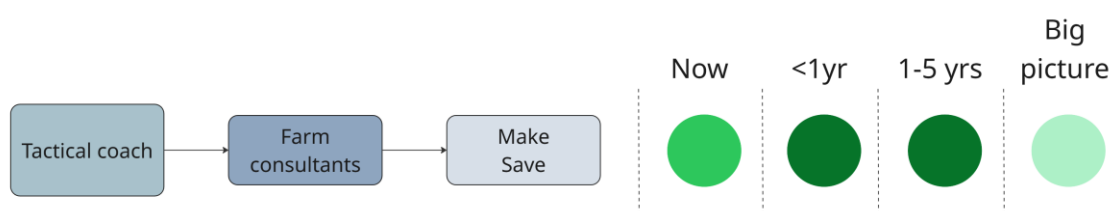
Tactical coach

Figure 10 – Time horizon – Tactical coach

Support provided to farmers can be varied and wide ranging depending on the farm situation however focused on optimising systems and processes on farm. This could include significant structural and strategic changes to get various benefits from the farm and business. They support farmers head towards their north star or primary goals.
Data requested will likely be farm goals, business plans, input cost, production output, stock numbers farm system, farm profile and attributes and stock or land use plans.

Nutritionist

Figure 11 – Time horizon – Nutritionist

Support provided to farmers is generally making sure the soil and crops are in great condition to support production outputs.
Data requested will likely be farm system, farm profile and attributes, and stock numbers
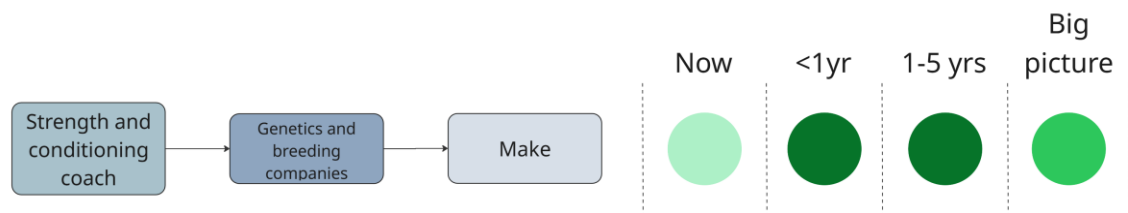
Strength and conditioning coach

Figure 12 – Time horizon – Strength and conditioning coach

Support provided to farmers is generally to improve the generic merit of the herd resulting in long term performance gains.
Data requested will likely be farm goals, detail animal records including health and genetic information, and milk production data.
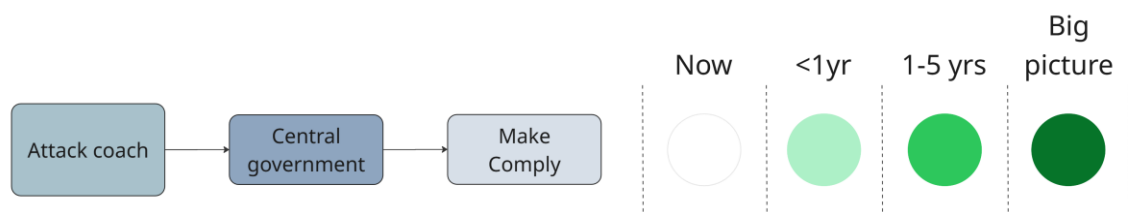
Attach coach

Figure 13 – Time horizon – Attach coach

Support provided to farmers is generally to promote 'NZ Inc' and positioning New Zealand Dairy farmers for premiums in internation market.
Data requested will likely be regional and nation data focused on animal health and wellbeing data, farm systems and environmental impacts.

Logistics and support manager
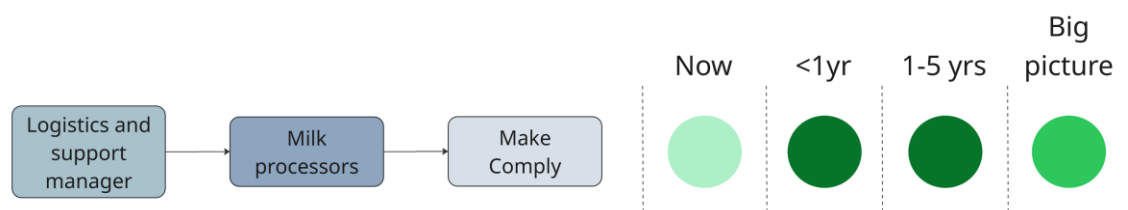
Figure 14 – Time horizon – Logistics and support manager

Support provided to farmers is generally to take farm outputs, process these into value-add commodities and generate the most revenue from these as possible. Generally, the aim is for these commodities to be sold to premium markets.
Data requested will likely be in support of substantiating market claims required to access premium markets such as stock numbers, herd level animal health and wellbeing data, farm systems and environmental impacts.

Performance analyst

Figure 15 – Time horizon – Performance analyst
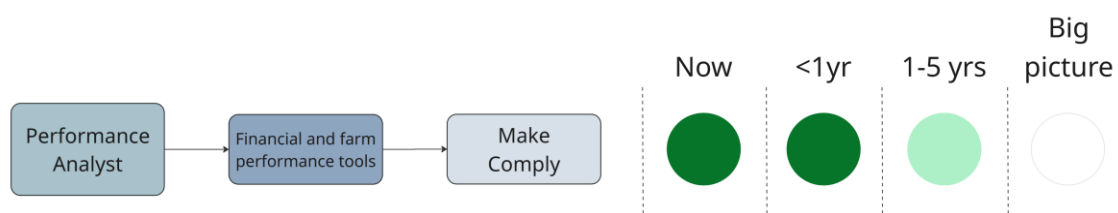
Support provided to farmers is generally summarising and benchmarking farm performance metrics to highlighting areas for improvement. This could be done on a farm trend perspective or a demographical dimension such as farm system, region or national level.
Data requested will likely be farm goals, business plans, input cost, production output and stock numbers.

Sports psychology
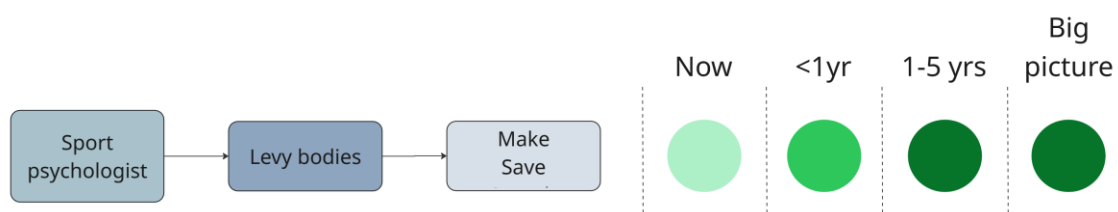
Figure 16 – Time horizon – Sports psychology

Support provided to farmers is generally long-term research and support for the significant challenges within the industry. Backed by scientific rigour, these bodies are there to support innovation within the industry.
Data requested will likely be animal records including health and genetic information, stock numbers, farm systems and environmental impacts.

Rehabilitation coach

Figure 17 – Time horizon – Rehabilitation coach

Support provided to farmers is generally making sure the animal health and wellbeing is where it should be.
Data requested will likely be detail animal records including health and genetic information, farm system and farm goals.

7. Limitations of this research

The study focused exclusively on the New Zealand dairy sector. However, given the increasing diversification of farming operations, some participants may have drawn on experiences from other agricultural sectors in their responses or from overseas.

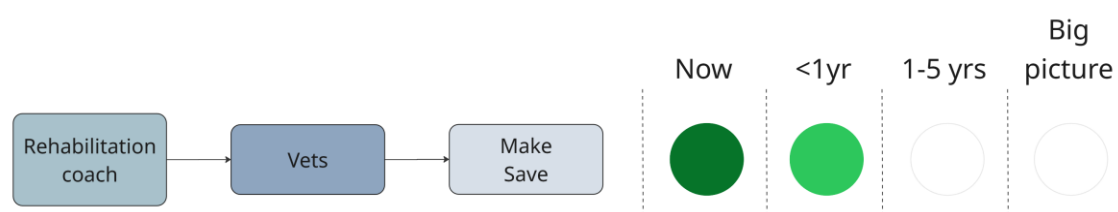Farmers interviewed all had an association with LIC. Despite this, LIC supports over 90% of the New Zealand dairy industry so is a good representation of the sector. While this provides broad industry representation, it may introduce bias due to the company's specific user base.

Efforts were made to ensure diversity in participant selection, particularly in terms of age and gender, to mitigate potential bias in interviews. These demographic factors may influence attitudes toward technology and data sharing and were considered when selecting participants and during analysis.

Due to the size of this research project, a conscious decision was made to limit the focus of interviews to farmers, IoT technology providers and milk processors.

8.Recommendations

This research highlights that while dairy farmers are increasingly comfortable with digital tools and open to data sharing, their willingness to share *accurate* data is conditional. Building trust, reducing friction, and aligning value are essential. The following recommendations aim to support milk processors, agri-tech firms, and industry organisations in creating a data-sharing ecosystem that is accurate, meaningful, and sustainable.

Clarify the Purpose Behind Data Requests

Many farmers interviewed expressed confusion around why certain data such as lameness events was being requested by milk processors. Processors should clearly explain how specific data points help support access to premium markets, validate claims under frameworks like the Co-operative Difference or Te Ara Miraka, or are required by international partners such as Nestlé or Mars to meet environmental, social and governance commitments.

Example: When asking for lameness data, processors could explain that this supports international animal welfare benchmarks such as the World Organisation for Animal Health (n.d.) helping to differentiate New Zealand dairy in high-value markets.

Strengthen Trust Through Transparency and Accountability

Companies like LIC and Fonterra, through their MINDA and FarmSource integration products, give farmers visibility and control over their shared data via a managed connections feature. These practices should be standardised across the industry.

Example: Implementing dashboards that show exactly who has access to what data, similar to FarmSource managed connections, builds trust and reduces the perception that data may be misused or shared without consent.

Design Incentives That Are Meaningful and Well-Calibrated

Processors such as Tatua and Fonterra offer incentives of up to $0.20/kgMS for meeting environmental and animal welfare standards. While effective, such programmes must ensure incentives are commensurate with the effort required. Farmers will not participate in schemes that require high input but deliver minimal or unclear return.

Example: Expanding incentives beyond compliance metrics to include data-sharing quality or proactive engagement could further strengthen accuracy, for instance, a bonus tier or reduction in audit requirements for submitting validated health records through automated systems.

Embed the "Make/Save/Comply" Framework in Product Design and Communication

Agri-tech firms such as Halter (for virtual fencing and behaviour monitoring) and Afimilk (for automated milking analytics) have successfully marketed their products based on how they save labour, improve productivity, or help meet compliance. Embedding the "make/save/comply" narrative directly into user onboarding, marketing, and training ensures alignment with farmer motivations.

Furthermore, clear differentiation between base compliance needs and access to incentive schemes would align the benefits to the correct category and could incentive farmers to share data without concerns.

Example: Herd recording providers could frame new features in terms of "better mating plans to drive higher in-calf rates" (make), "saving hours of paperwork" (save), or "automated compliance with NAIT and MPI audits" (comply) to drive more accurate and complete data entry.

Promote Interoperability and Integration Across Systems

A consistent frustration from farmers was the duplication of effort caused by disconnected systems. Milk processors and agri-tech firms must commit to improving interoperability, especially as new technologies and AI analytics become common.

Example: DairyNZ, LIC, and milk processors could collaborate on shared data standards to allow seamless sharing of herd health data between MINDA, DairyBase, and processor-specific platforms like Fonterra's Farm Source or Synlait's supplier portal. This could be implemented through standards like ICAR (*ICAR – The Global Standard for Livestock Data*, n.d.).

Train Industry Representatives to Adopt a "Coaching Role" Mindset

Milk processors and agri-tech companies must recognise the different "hats" they wear in their relationships with farmers. The "coaching team" analogy ranging from performance analyst to rehab coach, helps industry representatives frame their role and data requests appropriately.

Example: When a milk processor representative is acting as a logistics and support manager, they could avoid requesting individual animal health data unless it's clearly tied to milk quality claims. In contrast, when herd improvement company engages as a strength and conditioning coach (genetics), detailed animal records are both expected and accepted.

Acknowledge and Address the Context Behind Farm Data

Farmers shared concern that raw data such as a spike in mastitis or lameness, could be misinterpreted without context. Agri-tech firms and processors should develop ways to capture explanatory notes or supporting information, particularly during seasonal stress periods or unusual events (e.g. extreme weather or staff turnover).

Example: Milk processors could allow farmers to tag events with "context markers" in digital reporting tools where the input or outputs are not reflective of the typical operation of the farm. These could be 'farm system change' or 'supplementary feed used due to a weather event', which are reviewed before any assessments are made.

Support Ongoing Farmer Education and Engagement

Farmers are increasingly aware of the power of data, but there is still a gap in data literacy and confidence, particularly among newer or older operators. Supporting education through webinars, peer case studies, or farm discussion groups will improve both trust and participation.

Example: Partner with Dairy Women's Network to deliver workshops focused on understanding how data drives market access, what "good data" looks like, and how to maintain sovereignty over farm information in an increasingly digital landscape.

Final remarks

These recommendations are grounded in the lived realities of New Zealand dairy farming today and the rapidly evolving expectations of global markets. By acting on them, industry stakeholders can ensure that data sharing is not just accurate and efficient, but trusted, ethical, and valued by those who produce it.

9. Conclusion

This research set out to explore a simple but deeply nuanced question: *Are dairy farmers incentivised to know about and share accurate on-farm event data, or are they more likely to share data that is favourable in the eyes of downstream consumers?*

The answer, as revealed through comprehensive review of relevant literature and interviews with farmers, milk processors, and agri-tech firms, is not binary. Instead, it sits within a spectrum shaped by incentives, trust, control, context, and the perceived value of data-sharing relationships. Farmers are not opposed to sharing data nor are they deliberately withholding it, but their decisions are guided by a rational cost-benefit assessment grounded in their lived experience, commercial pressures, and cultural values.

Across all interviews, it became clear that farmers are generally willing to share accurate data when primary and secondary needs are met. In addition, data sharing needs to return some kind of benefit directly to the farmer.

Farmers must retain control over who accesses their data, what it will be used for, and when it is shared. There must also be a high level of trust in the individuals or organisations requesting the data. Finally, there needs to be a tangible benefit for the farmer, whether it's financial, operational, or aligned with their values and long-term goals. These insights align strongly with the "make/save/comply" framework that emerged through this research. This frames farmer motivation in terms of productivity gains (make), efficiency or cost reduction (save), and meeting industry or regulatory obligations (comply). Where these conditions are not met, particularly where the purpose of the data is unclear, the value is ambiguous, or the requesting party lacks a trusted relationship, farmers are more likely to hesitate, underreport, or provide only what is minimally required. This is especially evident in data requests tied to compliance or external scrutiny. In these cases, the perceived risk of reputational or financial harm may outweigh the potential benefit of transparency. Notably, this behaviour is not necessarily about deception, rather, it reflects a reasonable desire to protect one's business from misinterpretation or punitive action.

There is a subtle but important distinction between accurate data and favourable data. While the former reflects the unfiltered reality of farm operations, the latter is shaped by what is seen to be acceptable or desirable in the eyes of downstream stakeholders. In the absence of clear, supportive frameworks and trusted relationships, farmers may lean toward presenting a more favourable picture of events particularly when facing uncertainty about how the data will be used or interpreted.

The findings also highlight a key challenge for the industry: the need for better integration, role clarity, and communication across the data ecosystem. Farmers interact with a wide range of third parties from agri-tech providers and milk processors to banks, auditors, and regulators, all of whom may request data for different purposes. The "coaching team" analogy presented in this report offers a helpful model for understanding how farmers perceive and engage with these different roles. When data requests are aligned with the perceived function of the partner, be it a performance analyst, nutritionist, or attach coach, farmers are much more likely to comply and provide accurate information.

The future of on-farm data sharing lies not in mandating compliance, but in building systems that are transparent, trusted, and farmer-centric. Milk processors and agri-tech firms that succeed in this space are those that respect farmer sovereignty over their data, provide clear explanations of its use, and deliver meaningful value in return, whether through insights, incentives, or access to high-value markets.

In conclusion, the question is not whether farmers are incentivised to share accurate data, but under what conditions they are most willing to do so. When supported with trust, transparency, and relevance, farmers demonstrate a high degree of professionalism and openness. The challenge for the broader agricultural sector is to build the infrastructure, relationships, and culture that make accurate data sharing the norm, not the exception. Doing so will not only improve on-farm outcomes but also enhance the credibility and competitiveness of New Zealand's dairy industry in an increasingly data-driven global market.

9.1. Future research opportunities

Given the size and nature of this research project, the scope and areas of focus were carefully managed. As such, some areas were considered out of scope or not fully explored however may merit future research consideration. These include:

- The role of regional and central government in encouraging accurate data sharing.
- Linking the positioning of New Zealand as a premium agricultural exporter at a macro level and the corresponding micro policy settings and compliance obligations felt on farm.
- Validation and extension of the coaching analogy and how this could be applied more broadly across the Food and Fibre industry.

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11. Appendix

11.1. Farmer questions

1. Can you tell me about your farm and what technology do you use?
2. In your experience, how well does technology capture farm events with the appropriate timing and sensitivity?
3. How do you perceive the ability of technology to reflect the performance of your farm and animals compared to your own observations?
4. Can you describe what great data sharing within the agriculture space looks like to you?
5. If all your farm data was freely available to Agri-tech or industry bodies, would anything keep you up at night?
6. How do you feel about the support provided by Agri-tech companies and industry bodies in making on-farm improvements?
7. How do you feel about the intentions of third parties when they ask for your farm data?
8. In what ways do you decide which companies to share your data with and which to avoid?

11.2. Milk processor questions

1. How have consumer expectations changed over the past 10 years?
2. How successful have incentive schemes been in aligning farming practices to consumer expectations?
3. Do you believe consumer expectations are tied to retail consumers or business objectives of downstream commodity consumers?
4. In what ways do you think farmer data contributes to the development and success of incentive programs?
5. Can you describe what great data sharing within the agriculture space looks like to you?
6. How has [insert processor] built trust with farmers around data sharing?
7. How does [insert processor] determine the areas where farmers need support and avoid areas that might be seen as overstepping?
8. How would you address farmers' concerns that sharing data with [insert processor] might lead to their exclusion from incentive programs?

11.3. Agri-tech company questions

1. Can you describe what great data sharing within the agriculture sector looks like for farmers?
2. Can you describe your customers' willingness to share data?
3. In your experience, how do you build trust with farmers?
4. How would you address a farmer who is concerned that data shared with industry partner will be used against them?
5. What measures do you take to ensure that the data provided by your products is seen as value add rather than critical/telling them off/mansplaining farming to them?
6. How do you ensure that your products are adding sufficient value whilst not adding to farmers' existing workload?
7. Describe to me how you consider processes and obligations outside of your product during your development of a new feature?