Economic Assessment of the Regulatory Delivery Model from Safe Food Production Queensland

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Bio

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Executive Summary

Over the past decade, Safe Food Production Queensland (SFPQ) has set clear strategic objectives, established well-crafted priorities, and implemented actionable initiatives to achieve them. SFPQ's mission is to create an adaptive regulatory framework that promotes public trust, generates effective actions in food safety that go beyond compliance, leverages emerging technologies and data driven approaches for optimised decision-making, collaborates effectively with diverse stakeholders, and advocates for supportive policies and legislation to build a resilient and sustainable food safety network. Success will depend on committing to and implementing a complex change management programme to modernise its service delivery framework and become a digitally enabled regulator.

This report analyses the economic rationale behind SFPQ's regulatory approach, highlighting how its current delivery model aligns with national standards and demonstrates readiness for future challenges.[1] The second part of the report presents recommendations to further enhance SFPQ's operations, focusing on designing a system of incentivised compliance, efficient risk-based fee pricing, and business benchmarking. By adopting these recommendations, SFPQ can improve its effectiveness, position itself as a leader in regulatory excellence, and provide a model for other industries and states when designing or updating their regulatory frameworks.

[1] Office of Impact Analysis, Regulatory Impact Analysis Guide for Ministers' Meetings and National Standard Setting Bodies, 18 January 2024.

1 Background

Regulation in the food industry is crucial for establishing unified safety and quality standards across diverse production methods. Regardless of whether food is produced through traditional farming, organic practices, or advanced technologies, or varies in scale, all must adhere to the same stringent safety requirements to protect consumers and maintain a safe, reliable food supply.

In the fast-paced global food industry, characterised by rapid innovation and evolving consumer expectations, effective regulation is increasingly essential. The industry's dynamic nature, marked by complex supply chains, novel production methods, and continuous technological advancements, presents significant challenges to traditional regulatory frameworks. These frameworks, which often depend on costly and labour-intensive on-site inspections, detection measures, and enforcement protocols, may struggle to keep pace with the industry's rapid changes and growing complexity.

A modern regulatory approach must be both comprehensive and flexible to effectively address the future complexities of the food industry. This involves ensuring food safety and quality, incentivising innovation, and generating sustainable economic growth. Additionally, the regulatory framework must adapt to evolving consumer expectations, which increasingly emphasise issues such as food provenance, zero waste initiatives, zero emissions targets, and animal welfare standards.

In 2000, Australia implemented a unified national food safety policy, adopting an outcomes-based approach to better address the challenges of the food sector.[2] In 2017, the Australia and New Zealand Ministerial Forum on Food Regulation initiated a stakeholder consultation to identify priority areas for strengthening the system and reducing foodborne illness. An agreement was reached to implement a whole-chain approach to improve food safety culture in critical sectors such as food service, horticulture, eggs, and poultry. There was also broad consensus on better managing horticulture food safety risks, focusing on education, culture, and upskilling.[3]

Despite significant efforts, foodborne illness in 2019 cost Australia an estimated AUD 2.44 billion. Pathogens such as *Campylobacter* (AUD 365 million annually), *Salmonella*, norovirus, and pathogenic *E. coli* each exceeded AUD 100 million per year in associated costs.[4] Persistent high rates of foodborne illness are largely driven by factors such as improper storage practices, poor hygiene, and disruptions across the supply chain. Addressing these complex challenges requires a transition towards regulatory systems that are incentive-based, outcomes-focused, proactive, and

[2] J. Smith, K. Ross, and H. Whiley. Australian food safety policy changes from a "command and control" to an "outcomes-based" approach: Reflection on the effectiveness of its implementation. *International Journal of Environmental Research and Public Health*, 13:12–18, 2016.

[3] Australia's Foodborne Illness Reduction Strategy 2018–2021+: A strategy to reduce foodborne illness in Australia, mainly related to *Campylobacter* and *Salmonella*.

[4] The annual cost of foodborne illness in Australia: Final Report for Food Standards Australia New Zealand, 15 September 2022. Research School of Population Health, National Centre for Epidemiology and Population Health, The Australian National University, Canberra ACT 2601, Australia.

adaptable. Using advanced technologies and innovative data-driven techniques is essential for enhancing food safety measures and more effectively mitigating risks. SFPQ is taking significant steps in this direction, demonstrating its potential to become a leader in food safety regulation within Queensland and setting a model for the rest of Australia to follow.

2 Assessment of the SFPQ's Regulatory Model

SFPQ's proposed regulatory delivery model aligns with core economic principles essential for a modern and effective regulatory framework. It surpasses the regulatory standards set by the Queensland Government, demonstrating a strong commitment to innovation, promoting proactive food safety measures that go beyond compliance, and enhancing public trust.

2.1 Core Economic Principles for a Modern Regulatory Delivery Model

A modern regulatory model must be designed to align the diverse objectives of stakeholders, ensuring that their actions contribute to desired outcomes such as safety, sustainability, efficiency, and public trust. Achieving an adaptable and responsive regulatory framework, capable of evolving with changing industry conditions, requires timely and accurate information sharing among all involved parties.

The following principles are crucial for this purpose:

1. **Clear Objective Definition**: Establish goals that are specific, measurable, achievable, and implementable.

2. **Incentive Provision**: Implement well-designed rewards and penalties to encourage behaviours that align with regulatory objectives.

3. **Information Disclosure**: Promote the voluntary sharing of private information to reduce information asymmetry, enabling more effective collaboration between stakeholders and regulators.

4. **Fit-for-Purpose**: Customise regulatory rules to address the unique characteristics, risks, and needs of the specific industry or sector.

5. **Adaptability**: Continuously evolve and adjust in response to changing market conditions, technological advancements, and shifting consumer preferences.

Establishing **clear and measurable objectives** is a fundamental first step for effective regulation. The goals set by the regulator must be specific, quantifiable, and realistically attainable

to enable transparent monitoring, assessment, and adjustment of regulatory outcomes. By defining precise metrics and benchmarks, regulators create a framework of accountability that holds all stakeholders responsible for their actions and progress. This clarity ensures that efforts and resources are purposefully directed towards achieving the regulator's priority goals.

A carefully designed incentive structure of rewards and penalties serves to motivate actors to align their actions with the regulatory objectives.[5] Effective **incentive schemes** may incorporate financial incentives, such as reduced fees or less stringent monitoring for those businesses demonstrating consistent compliance and exceptional performance. Reputational rewards, such as certifications, industry accolades, and public recognition, can further encourage adherence to regulatory standards by elevating a business's standing within the market. Penalties for non-compliance could involve fines, increased inspection frequencies, or even legal sanctions. By aligning individual incentives with overarching regulatory goals, regulators encourage firms to internalize the importance of compliance and actively promote effective safety measures that go beyond mere adherence to standards. This approach is especially valuable in situations where direct monitoring is challenging or resource-intensive, as it encourages desirable behaviour even without continuous oversight.

Reducing information asymmetry between businesses and regulators is critical for designing and implementing effective incentives. Businesses often possess extensive knowledge about their own operations, technologies, and cost structures, which may not be fully accessible to regulators. This informational gap can lead to opportunistic behaviour and hinder regulatory effectiveness.[6] Encouraging businesses to voluntarily **disclose information**, potentially in exchange for reduced regulatory burdens, streamlined processes, or tailored support, can help bridge this gap.[7] More information sharing provides regulators with a clearer understanding of industry practices, risks, and operational processes, allowing for more targeted interventions and the design of customised incentives that better address specific needs. Additionally, when businesses and regulators operate with the same information, it promotes greater collaboration, builds mutual trust, and enables both parties to work toward shared objectives more effectively.

With detailed information, regulators can create a **fit-for-purpose** regulatory model that is tailored to the specific characteristics and risks of each sector or business.[8] Recognising that a one-size-fits-all approach often proves inefficient, tailored regulations take into account the unique operational contexts and challenges faced by different businesses. This customisation enables regulators to concentrate their resources on areas of highest risk or concern. By eliminating

[5] J.-J. Laffont and J. Tirole, *A Theory of Incentives in Procurement and Regulation*, MIT Press, Cambridge, MA, 1993.

[6] J. E. Stiglitz, "The Contributions of the Economics of Information to Twentieth-Century Economics," *The Quarterly Journal of Economics*, vol. 115, no. 4, pp. 1441–1478, Nov. 2000.

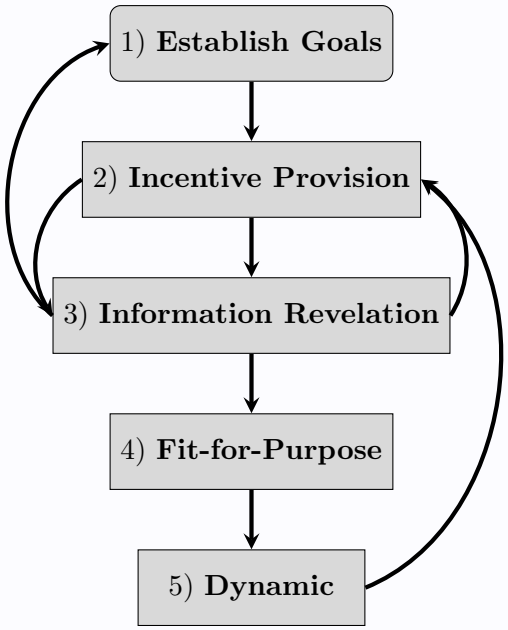
[7] J. R. Green and J.-J. Laffont, "Mechanism Design with Incomplete Information: The Revelation Principle," *Econometrica*, vol. 55, no. 3, pp. 427–454, 1987.

[8] M. Dewatripont and J. Tirole, "Advocates," *Journal of Political Economy*, vol. 107, no. 1, pp. 1–39, 1999.

irrelevant or redundant requirements, fit-for-purpose regulation reduces unnecessary burdens on businesses, allowing them to allocate resources more effectively toward actions that exceed mere compliance with prescribed standards. Furthermore, this tailored approach encourages innovation, as firms are given the flexibility to achieve regulatory objectives in ways that best align with their specific circumstances.[9]

A fit-for-purpose regulatory system is **dynamic** and responsive to change. By continuously incorporating feedback, learning from past experiences, and monitoring industry trends, regulators can adapt policies to reflect evolving practices, technological advancements, and shifting consumer demands. This adaptability ensures that the regulatory framework remains both relevant and effective over time, enabling continuous improvement and resilience.[10] Such a dynamic system allows for the integration of new information to refine incentive structures, strengthen compliance mechanisms, and even modify regulatory goals as industry conditions and societal expectations evolve.

Figure 1. Core Economic Principles for a Modern Regulatory Delivery Model.



As illustrated in Figure 1, many of these principles are interrelated. For instance, the provision of incentives plays a key role in motivating firms to disclose valuable information, which subsequently enhances the design and effectiveness of those same incentives. Additionally, the principles of adaptability and dynamism enable continuous refinement of both incentive schemes

[9]Coglianese, C., and Mendelson, R. (2012). "Meta-Regulation and Self-Regulation." THE OXFORD HANDBOOK ON REGULATION, Martin Cave, Robert Baldwin, Martin Lodge, eds., 2010.

[10]Andrei Shleifer. "Understanding Regulation". European Financial Management, Vol. 11, No. 4, 2005, 439–451

and regulatory goals, ensuring that the regulatory framework remains relevant and responsive to changing industry practices and external conditions.[11]

2.2 SFPQ's Alignment with the Regulator Performance Framework

The new regulatory framework proposed by SFPQ aligns with the Regulator Performance Framework established by the Queensland Government. Committed to upholding high standards of food safety, SFPQ's approach streamlines compliance processes to reduce burdens and create tangible benefits for all stakeholders within the food system.

2.2.1 Risk-Based Regulation and Minimising Burden

SFPQ employs a comprehensive risk management approach to ensure that regulatory activities are proportionate, effective, and minimise unnecessary burdens on businesses. The risk-based model utilised by SFPQ identifies hazards based on their likelihood and potential impact, distinguishing it from traditional hazard-based approaches that aim to control all possible food safety risks without evaluating their severity or probability.[12] Under this model, regulatory decisions are guided by both quantitative and qualitative assessments, focusing resources on managing and mitigating high-risk areas to acceptable levels rather than attempting to eliminate all possible hazards.[13]

Access to accurate data and robust analysis is essential for implementing a successful risk-based regulatory approach. To meet this need, SFPQ is investing in advanced data infrastructure and analytics to ensure its regulatory decisions are scientifically grounded. For example, SFPQ plans to develop a System Maturity Risk Assessment Tool (SMART) that will assess business maturity using a risk categorisation model and assign a risk prioritisation score to each business. Business performance data will then be used to evaluate compliance behaviours and adjust prioritisation when necessary.

To obtain data, SFPQ requires businesses to complete the Business Profile and Business Characteristics as part of the application process. The questions are classified and based on food safety risks through PIICMT (Prevention, Identify and Isolate, Control, Maintain, Trace) and promotes a culture of food safety with APC (Awareness, Provision, Commitment).[14] This information is

[11] S. Athey and J. Roberts. Organizational design: Decision rights and incentive contracts. *American Economic Review*, 91(2):200–205, 2001.

[12] A hazard-based approach would identify and control all possible food safety hazards without assessing their likelihood or impact.

[13] G. Stoneham, S. M. Hester, J. S.-H. Li, R. Zhou, and A. Chaudhry, "The Boundary of the Market for Biosecurity Risk," *Risk Analysis*, vol. 41, no. 8, pp. 1466–1483, 2021.

[14] PIICMT is a comprehensive framework focusing on preventing hazards, identifying and isolating issues, controlling risks, maintaining standards, and tracing products, while APC emphasises building a culture of food safety through awareness, resource provision, and commitment to safety standards.

crucial for understanding business processes and operational aspects, enabling better identification and assessment of potential risks within each business.

The compliance pathway, determined by each business's assessed risk level, incentivizes companies to enhance their safety practices by offering reduced regulatory burdens to those demonstrating proactive and effective risk management. Businesses seeking a lower risk profile are encouraged to implement robust mitigation strategies, taking primary responsibility for their compliance. As businesses improve their response to risk and reduce their overall risk, they benefit from decreased regulatory oversight and associated costs.

2.2.2 Stakeholders Engagement and Consultation

To encourage extensive stakeholder engagement in its regulatory decision-making, SFPQ has established various formal and informal consultation platforms. By collaborating closely with industry stakeholders to set baselines and agree on performance targets reflecting best practices, SFPQ ensures broad representation—including food businesses, regulatory bodies, research institutions, and consumers. This inclusive approach has been crucial in achieving well-informed regulatory decisions that align with the practical needs of businesses, generating a more effective, responsive, and collaborative regulatory environment.

For example, over the past decade, SFPQ has worked with stakeholders across various industries to develop a baseline model, providing a standard framework to help businesses consistently produce safe food for consumers. A key element of this model includes a process map with appropriate risk mitigation steps designed to minimise food safety risks during production. This framework incorporates measurable parameters monitored at verification points, which are recorded, tracked, and acted upon to ensure compliance and continuous improvement. SFPQ's initial collaboration with the poultry industry, including the establishment of specific interventions and acceptable parameters, influenced national food safety policy within the poultry sector.

SFPQ's commitment to building cooperative relationships with stakeholders is also key to generating trust and improving the overall effectiveness of the regulatory framework. For instance, the agency actively disseminates best practices, leads research initiatives, and coordinates responses to emerging food safety threats. Additionally, SFPQ has partnered with the Global Food Safety Initiative and industry peak bodies to co-design a recognition framework for industry-led quality assurance programs, further demonstrating its dedication to continuous collaboration and engagement.

To address evolving consumer expectations, such as animal welfare and environmental standards, SFPQ plans to broaden its engagement by involving additional stakeholders, including technology providers, startups, innovators, and international food safety agencies. SFPQ's board

now includes senior executives from Queensland Health and the Department of Agriculture and Fisheries, enhancing cross-government collaboration. This integration will ensure that SFPQ's strategies are informed by broader governmental policies and that its expertise and insights are shared with regulatory partners throughout Queensland.

2.2.3 Information Provision and Compliance Assistance

By sharing information on best practices, industry safety performance, inspection results, and compliance levels, SFPQ generates a culture of transparency and accountability. This approach holds both the industry and individual businesses responsible, offering a clear view of their performance by highlighting areas for improvement.

SFPQ facilitates compliance with food safety regulations by providing information and assistance through various channels. For instance, the Central Information Management System (CIMS) supports businesses by analysing industry data against agreed performance targets at critical stages of food production. This through-chain monitoring enables the industry to demonstrate adherence to best practices and achieve key objectives. The system also allows businesses to input their own data, take preventive actions, and evaluate the impact of those actions on risk reduction. Over time, these tools will help businesses reduce the likelihood of adverse outcomes and will also provide valuable insights into how specific investments can influence their risk scores and compliance pathways.

SFPQ's comprehensive information system integrates three key data sources, combining both static and dynamic information. The first source, Business Profile and Business Characteristics, consists of static data that characterizes business attributes. The second source, Process Data (PD), captures dynamic information gathered during operational processes, providing information into efficiency and operational status through metrics like processing methods and hygiene records. The third source, External Data (ED), takes into account market trends, environmental conditions, and supplier quality data, which can significantly influence operational decisions and strategic planning.

To further enhance information sharing, interaction, and cooperation among stakeholders in the food supply chain, SFPQ is investing in a new digital platform that leverages machine learning tools to integrate the three previously mentioned data sources. As part of this initiative, SFPQ plans to implement a Bayesian Network (BN) to analyze correlations between static and dynamic elements, enabling the prediction of realistic outcomes. This platform will offer improved performance predictions and provide real-time alerts for deviations and emerging risks, providing continuous assistance to compliance processes.

2.2.4 Commitment and Continuous Improvement

SFPQ's approach is designed to be both dynamic and adaptive, relying on continuous data collection and analysis to respond effectively to emerging trends and risks. By employing advanced analytics and predictive modelling, SFPQ can proactively identify and mitigate potential hazards, ensuring that the regulatory framework stays relevant, effective, and responsive. This capability will enhance the safety, quality, and efficiency of the food production system as the industry evolves.

For low-risk activities, a central element of SFPQ's future business model is self-servicing, which enables businesses to perform self-assessments based on system-generated alerts. Accredited businesses will have access to personalised client portals, where they can document corrective actions, update business profiles, and revise their food safety programs or management strategies. This streamlined process highlights implemented changes to prevent recurrence and fosters greater accountability and responsiveness within the industry.

At the conclusion of each accreditation period, SFPQ renegotiates contracts for third-party auditors following comprehensive performance evaluations of the service providers. This approach promotes accountability and quality assurance among auditors. Continuous improvement is further supported by regular training sessions for auditors, conducted by SFPQ staff, which focus on areas needing enhancement and incorporate updates to standards or scheme requirements. This process ensures that audit practices remain effective, aligned with regulatory goals, and adaptable to evolving industry standards and best practices.

2.2.5 Transparency and Accountability

With near real-time data and field insights, SFPQ can quickly identify potential risks and implement targeted interventions. Transitioning to a digital platform powered by advanced data analytics will further enhance information exchange between the industry and SFPQ. This platform will provide actionable insights via dashboards, customised reports, and visual risk tools to prioritise actions aimed at minimising food safety violations. Additionally, an online application system will streamline processes, allowing for real-time tracking, monitoring, and reporting. During emergencies, the system will enable rapid data retrieval and communication, ensuring swift issue resolution to protect public health and maintain industry reputation.

SFPQ consistently engages with key industry groups and accredited businesses, developing strategic plans and publishing annual reports to promote transparency. By employing key performance indicators, SFPQ tracks progress toward strategic goals, such as enhancing public trust, adopting technological innovations, and fostering cross-sector collaboration.

3 Areas of Improvement and Recommendations

SFPQ can implement several strategies to enhance business proactivity within its current delivery framework. Although the agency plans to reward compliance by reducing audit time and frequency, thus incentivizing adherence to standards, there is still potential to further increase proactivity by better utilizing the extensive amount of data that SFPQ is currently collecting. We propose three key areas for improvement:

1. **Implement an incentivized compliance method.**
2. **Introduce a fee classification system under the accreditation process based on risk assessment and consider how this may evolve over time.**
3. **Enhance effective benchmarking practices.**

When fully implemented, these strategies will enhance SFPQ's ability to encourage businesses to proactively maintain high standards, cultivate a culture of compliance, and diminish the need for constant regulatory oversight. This shift will enable SFPQ to redirect its resources toward higher-risk areas.

3.1 Incentivised Compliance

Traditional enforcement methods rely on regulatory agencies conducting routine or random inspections to ensure compliance with existing laws and regulations. This reactive process enforces regulation through periodic inspections. When non-compliance is detected, enforcement actions are initiated, which may include corrective measures, warning letters, penalties, or even license revocation. Typically, this method involves several sequential steps: inspections to verify adherence, detection of violations, enforcement actions, follow-up inspections, and detailed record-keeping and reporting.

While traditional enforcement methods ensure regulatory adherence, SFPQ is designing a less burdensome approach that reduces scrutiny and interventions for businesses that remain compliant. However, despite significant improvements over traditional methods, the SFPQ approach still faces challenges related to labour-intensive costs and relies on retrospective compliance through record-keeping. Consequently, compliance is often achieved *post-factum*, making it sluggish and more costly to address regulatory failures.

An incentivized compliance approach offers a more proactive and decentralized regulatory method. It encourages businesses to undertake desired actions dictated by the regulator through a carefully crafted system of rewards and penalties—known as **incentive design**. Effective incentive design requires a thorough understanding and intensive data collection process to first identify

the outcomes the regulator aims to achieve and then determine the specific set of business actions most likely to lead to those outcomes. Understanding the **link between actions and outcomes** is essential, as certain actions may lead to unintended consequences or undesired results. Once the appropriate actions are identified, rewards and penalties must be carefully designed to encourage those actions.

The incentivized compliance approach emphasizes prevention over punishment, generating several benefits:

1. **Reduced need for continuous surveillance:** It minimizes the regulator's need for ongoing monitoring, allowing businesses to meet compliance requirements more efficiently.

2. **Lower enforcement expenses:** It decreases enforcement costs and fosters collaboration between regulators and businesses, leading to improved problem-solving.

3. **Collaborative relationship:** It improves communication between regulators and businesses, facilitating joint efforts for common problem-solving.

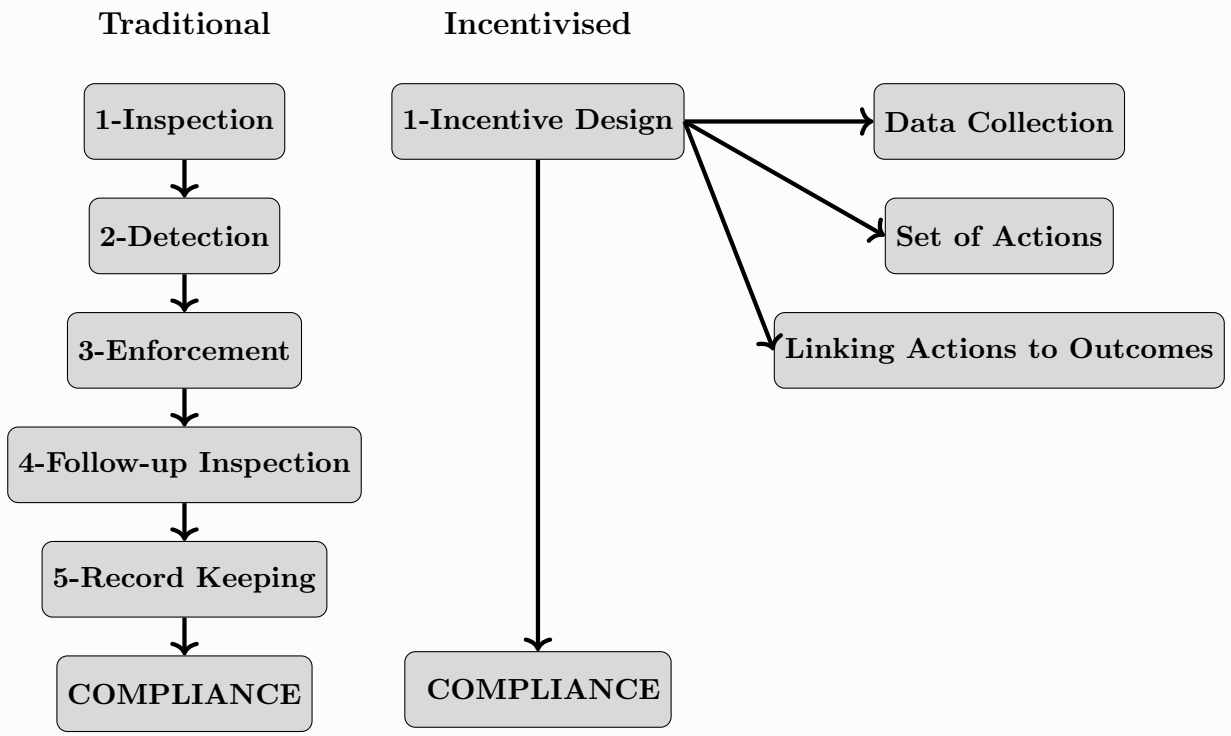
4. **Alignment of interests:** It aligns business interests with regulatory objectives, promoting behavior change and enabling more flexible regulatory approaches. Businesses are motivated to maintain compliance proactively, knowing that adherence leads to tangible benefits such as reduced audits or financial incentives.

5. **Cost-effectiveness:** It reduces costs associated with remedial activities—such as recalls, tracebacks, and reputational damage—and encourages proactive behavior over burdensome reactive responses.

6. **Innovation:** Incentives motivate businesses to adopt innovative practices to achieve required outcomes more effectively and efficiently. Once objectives are set, businesses find the most efficient internal processes within their organizations to meet them.

As illustrated in Figure 2, while incentivized compliance may entail higher initial setup costs, largely due to the need for extensive data collection and the precise design of rewards and penalties, it can significantly streamline regulatory processes when properly implemented. By investing in a robust upfront framework, regulators and businesses can reduce the complexity and frequency of ongoing interactions. Once established, this approach demands fewer steps to achieve and maintain compliance compared to traditional methods, as it shifts the focus from repetitive oversight to proactive engagement. The initial investment yields long-term benefits through reduced enforcement costs, enhanced efficiency, and a stronger culture of compliance within the industry.

Figure 2. Traditional vs Incentivised Compliance Approaches.



There is considerable potential for SFPQ to develop a robust and well-structured incentive scheme aimed at improving compliance and food safety outcomes. To achieve this, SFPQ is creating a predictive model using a Bayesian Network to identify potential hazards early and enable timely risk mitigation. This model allows for the identification of causal links between actions and outcomes, which is critical for designing effective incentives that drive desired behaviours. Leveraging real-time data analytics and machine learning, SFPQ can further refine these incentive schemes to ensure they are both effective and cost-efficient, enhancing compliance while minimising regulatory burdens.

3.1.1 Design of Rewards and Penalties

Incentive design, rooted in economic theory, aims to address the principal-agent problem, where the regulator (principal) seeks to motivate the business (agent) to undertake specific actions that align with regulatory goals. In the context of food regulation, these actions might include proper waste management, minimising the use of additives, or implementing measures to reduce the risk of cross-contamination.

Since businesses often possess more detailed knowledge of their own operations, directly observing their actions may be only partially effective or require extensive and costly inspection efforts. When direct inspections become too costly, reducing surveillance and adopting alterna-

tive strategies becomes more practical. One such solution involves linking observable outcomes to desired actions through a system of rewards and penalties.[15] This approach relies on identifying measurable outcomes that are indicative of the desired behaviours.

Relevant data linking actions to potential outcomes is essential for rewarding activities that generate desired results. In designing the reward structure and determining which specific outcomes merit a reward, it is crucial to apply the "sufficient statistic" principle. This principle suggests that outcomes lacking information on the actions that led to them should not be used to establish rewards or penalties.[16] Additionally, outcomes that are highly correlated with other measurable outcomes should not receive compensation, as this would fail to enhance compliance and only generate unnecessary costs.

Incentives must account for the actions taken by food businesses while also considering external factors beyond their control. This ensures businesses are neither unfairly penalised nor excessively rewarded. Care must also be taken to avoid unintended consequences; for instance, incentivising specific outcomes tied to contamination risk reduction may inadvertently lead to over-reliance on certain practices, potentially neglecting other critical food safety measures. Such an outcome-based focus must be balanced to avoid creating narrow compliance incentives that could undermine overall food safety objectives.

Recommendation 1

To enhance compliance and drive meaningful behavioural change in regulated businesses, it is recommended that SFPQ uses the data it is currently collecting to explore an incentivised compliance regulatory approach. Specifically, SFPQ could consider the following actions:

- **Explore and establish clear outcome measures** by leveraging Australia's Foodborne Illness Reduction Strategy 2018–2021+. This strategy set measurable goals to reduce specific illnesses.[a]
- **Identify and promote specific actions to be undertaken by regulated businesses.** Establishing and clearly communicating a set of priority actions to businesses and stakeholders.
- **Utilise data-intensive methods and predictive models to strengthen the link between actions and outcomes.** By using data-driven insights and predictive modelling, SFPQ can better understand which business actions lead to desired compliance outcomes, enabling more targeted interventions and support.

[15] Laffont, J.J., and Martimort, D. (2002). The Theory of Incentives: The Principal-Agent Model. Princeton University Press

[16] Holmström, Bengt. "Moral Hazard and Observability." *The Bell Journal of Economics*, vol. 10, 1979, pp. 74-91.

- **Apply economic principles to design effective incentives and penalties based on observable outcomes.** Incentive structures should be carefully designed to reward businesses for achieving measurable compliance outcomes while penalising non-compliance.

[a]Australia's Foodborne Illness Reduction Strategy 2018–2021+: A strategy to reduce foodborne illness in Australia, mainly related to Campylobacter and Salmonella.

3.2 Risk-fee pricing with dynamic adjustment

The recognition model that SFPQ intends to implement features a fee structure designed to align surveillance activities with the maturity of industry programs and businesses' digital readiness to share key performance data. This approach adjusts the frequency and duration of audits based on business performance, enabling well-managed companies to more effectively control their compliance costs. Fees are determined by priority classification, meaning high-risk businesses or those with lower digital maturity will face higher fees due to the need for more extensive oversight. Grounded in the principles of performance-based regulation, this fee structure holds firms financially accountable for their compliance levels. Also, by linking fees to compliance, the model incentivises businesses to take proactive measures to minimise non-compliance risks, thereby reducing their financial burden.[17]

Building on the established fee structure that aligns costs with food safety impacts, the introduction of risk-based premiums can significantly enhance the effectiveness of the fee system. By incorporating actuarial pricing, which adjusts fees based on each business's specific risk profile, higher-risk businesses would bear a greater financial burden, thereby creating a strong incentive to lower their inherent risks.[18] This will promote fairness, ensuring that compliance costs reflect each business's unique risk level, while motivating proactive safety measures to mitigate potential hazards.[19]

To maximise the benefits of this system, ensuring transparency in fee calculations is critical. Investing in a robust data infrastructure would support these initiatives, providing businesses with a clear understanding of how their compliance efforts translate into financial incentives. Also, to better calibrate fees to the level of regulatory oversight required, the proposed risk-based fee structure must be dynamic. Businesses that demonstrate maturity in effectively managing risk should be rewarded with reduced fees, while those failing to show progress must face increased

[17]W. J. Baumol and W. E. Oates. The Theory of Environmental Policy. Cambridge University Press, 1988.

[18]Actuarial pricing uses statistical and mathematical models to assess the likelihood of adverse events and their potential associated costs.

[19]G. Stoneham, S. M. Hester, J. S.-H. Li, R. Zhou, and A. Chaudhry. The boundary of the market for biosecurity risk. Risk Analysis, 41(8):1466–1483, 2021. doi: 10.1111/risa.13620

accreditation costs. SFPQ can leverage data from existing compliance pathways or information collected through the Audit, Assessment, Notification, and Complaint (AANC) system.

While some of SFPQ's strategies already incorporate elements of actuarial pricing, the following recommendation focuses on establishing a more systematic approach to further optimise the fee system. This approach aims to ensure that fees more accurately reflect the inherent risk level of each business over time, enabling dynamic adjustments that align with changes in risk profiles.

Recommendation 2

Key steps to better evaluate and assess risk that SFPQ could take are:

- **Conduct workshops to identify risks:** Evaluate potential risk factors which may include the type of products, activities, and processes, to systematically assess and assign scores that represent each business's inherent risk level.
- **Develop and refine predictive models to assess future risks and calculate their potential costs.** These models should incorporate a range of variables to improve accuracy and effectiveness, including:
  - **Industry Benchmarks:** Utilise risk metrics from comparable businesses or sectors to establish baselines and inform risk assessments.
  - **Historical Data on Contamination:** Analyse the frequency and severity of past contamination incidents to identify patterns and areas requiring focused intervention.
  - **Inspection Results:** Consider trends from previous inspections, such as recurring instances of non-compliance, to better gauge future risks and compliance challenges.
  - **Predictive Variables:** Include factors such as seasonality, regional outbreaks, and market trends that can influence risk levels and require proactive measures.
- **Create a dynamic pricing model for fee adjustments** with fees tailored to each business's specific risks and behaviours. This model should be regularly re-calibrated using updated data to ensure that fees accurately reflect current risk levels. Some elements could be:
  - A risk score can be readjusted based on factors such as compliance history, and operational risk.
  - Inspection outcomes and mitigating actions, would influence the risk score and, consequently, the pricing structure.

- **Communicate risk profiles**, making the system provide a risk score breakdown, compliance recommendations, real-time performance metrics, cost impact projections, and digital tools for tracking progress.

3.3 Efficient and Effective Benchmarking

SFPQ's proposed regulatory approach places a strong emphasis on transparency and information sharing as key elements. By leveraging both individual and aggregated industry data, businesses are able to benchmark their performance against industry averages and peers. Publicly reporting industry trends allows SFPQ to provide a clear measure of the regulatory system's effectiveness while generating a two-way flow of information. Businesses gain access to valuable insights about their performance relative to industry benchmarks, while SFPQ can offer targeted feedback to encourage continuous improvement. This strategy aligns with best practices in risk-based regulation, where shared performance metrics motivate businesses to adopt superior practices, aiming to meet or surpass industry standards and driving overall industry improvement.[20]

Beyond the intrinsic motivation derived from benchmarking results, the system can be further enhanced by providing additional incentives for top performers. SFPQ is already exploring incentives such as streamlining regulatory processes or reducing inspection frequencies for businesses that consistently achieve high performance. Such measures can lower administrative burdens and operational costs, creating significant financial incentives for compliance and excellence. Simple yet effective mechanisms, such as public recognition through awards, certifications, or rankings, can also enhance the reputation and marketability of top-performing businesses, further motivating them to maintain high standards. Providing access to exclusive training programs, workshops, and resources for businesses that meet or exceed benchmarks will support their continuous improvement efforts.

Promoting industry-wide collaboration and the sharing of best practices can elevate overall industry standards. To address potential concerns about competitive advantage, SFPQ could establish neutral third-party collaborations or partnerships with industry associations to facilitate the sharing of anonymised data and general insights without compromising proprietary information. Incentivising participation in best practice sharing could include granting access to exclusive resources, regulatory privileges, or formal recognition programs that publicly reward companies for contributing to the industry's collective improvement. Such measures would further enhance cooperation and drive sustained industry-wide progress.

[20]Holmström, Bengt. "Moral hazard in teams." The Bell Journal of Economics, 13(2):324–340, 1982.

Recommendation 3

To further enhance industry standards, SFPQ could consider the following measures:

- **Adopt QR code labels linked to the SFPQ register**, allowing businesses to share their profile, accreditation, and compliance history with customers in a read-only format.
- **Provide public recognition through awards and certifications** to boost the market reputation of top-performing businesses.
- **Offer exclusive training and resources for high achievers**. Develop specialised training programs, workshops, and resource-sharing opportunities tailored for businesses that meet or exceed regulatory benchmarks.
- **Promote industry-wide collaborations and best practice sharing**. SFPQ could organise forums, workshops, and collaborative groups to foster this knowledge-sharing culture.
- **Offer exclusive resources and recognition** to top performers willing to share their knowledge with other firms in the industry.