

# GLOBAL MODELS OF RUMINANT INDUSTRY GOVERNANCE: LESSONS FOR MALAYSIA'S BEEF AND DAIRY SECTOR

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## Abstract

Malaysia's ruminant sector faces structural challenges including low productivity, weak value chains, and fragmented institutional support. With increasing demand for meat and dairy products, a sustainable development model is crucial. This study investigates how Australia's Meat & Livestock Australia (MLA) and other international livestock organizations manage funding, innovation, and traceability through statutory levies. Using a qualitative case study method and comparative analysis, this paper proposes a hybrid Malaysian Ruminant Industry Corporation (MRIC) that integrates global best practices tailored to Malaysia's context. The proposed MRIC combines elements from MLA, Ireland's ICBF, and India's NDDB to create an inclusive, efficient and market-driven system. This institutional synthesis illustrates how developing economies can overcome the constraints of single-model adoption by strategically integrating complementary governance mechanisms to address context-specific challenges and utilizing universal principles of effective livestock industry coordination.

### Keyword:

Ruminant industry, levy system, traceability, smallholders, food security



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## Introduction

The livestock sector plays a critical role in ensuring food security, promoting rural livelihoods, and supporting national self-sufficiency in meat and dairy production. However, in Malaysia, cattle

production significantly lags behind rising domestic demand, resulting in an over-reliance on meat imports. This imbalance undermines national food security objectives and limits rural economic development. A key constraint in Malaysia's ruminant sector is the absence of a structured and cohesive funding mechanism to support research, innovation, marketing, and infrastructure development. Australia's Meat & Livestock Australia (MLA) serves as a successful global benchmark a levy-funded, industry-led organization that effectively channels resources into improving livestock productivity and market competitiveness. The fundamental discrepancy between Malaysia's production capacity and consumption patterns is indicative of more profound institutional failures in the coordination of collective action. The absence of systematic financing mechanisms perpetuates a pernicious cycle of under investment and competitive disadvantage.

This paper explores how the MLA model, as well as other international frameworks, can inform the design of a sustainable ruminant industry governance structure in Malaysia. Through a comparative lens, we assess the feasibility and adaptability of these models to Malaysia's smallholder-driven livestock ecosystem and propose a hybrid system that combines efficiency, traceability and inclusive.

### Problem Statement

Malaysia's ruminant industry suffers significant challenges of low self-sufficiency and heavy dependency on imports, undermining national food security and price stability. The problems exist partly from a lack of centralized coordination and sustainable funding mechanisms. While national agrofood policies have attempted to address sectoral weaknesses, they often fall short due to fragmented institutional support and inconsistent implementation (Shamsudin et al., 2020; MOA, 2021; DVS, 2023). A significant policy gap is the lack of a statutory transaction levy system that enables consistent funding for long-term improvements in genetics, traceability, market access, and innovation. The absence of institutional mechanisms to internalise positive externalize results in systematic under investment in public goods, which are essential for sector-wide competitiveness. This governance vacuum exemplifies this phenomenon.

This deficiency is particularly evident in direct transactions along the value chain such as sales between breeder/importer-to-feedlotter, importer-to-trader, and farmer-to-trader where no intermediary collects or remits levies. Consequently, government bodies are constrained in their ability to fund critical initiatives like halal certification, digital marketing, and R&D (FAO, 2022; OECD/FAO, 2023). Structural issues such as low productivity, fragmented value chains, and limited economies of scale further weaken the industry's resilience and capacity to scale (Alias et al., 2019; MAFI, 2021; Norhidayu et al., 2022). The ubiquity of informal transactions demonstrates the systematic undermining of formal governance mechanisms by market structure characteristics, resulting in implementation challenges that necessitate innovative institutional solutions that carefully balance regulatory compliance with market flexibility.

### Literature Review

Global livestock development models offer valuable insights into effective governance, funding, and innovation strategies. Australia's MLA is a leading example of a statutory levy-funded organization that reinvests in the sector through research, market access programs, and supply chain enhancements. It operates under strict regulatory oversight by the Department of Agriculture, Fisheries and Forestry (DAFF), ensuring transparency and industry accountability (DAFF, 2023; MLA, 2024). The MLA model illustrates how institutional design can address collective action issues by providing obligatory involvement means which are compatible with personal rewards with sector-wide incentives, all while preserving democratic governance and stakeholder integrity.

Ireland's model features a dual-institution structure: Bord Bia for marketing and ICBF for genetic improvements and data integration. Together, these bodies enhance branding, traceability, and productivity (Bord Bia, 2023; ICBF, 2022). This institutional specialisation demonstrates how the

optimised performance within distinct goals can be achieved while preserving strategic alignment through supplemental capabilities of organisations through the functional division of labour.

India's National Dairy Development Board [(NDDDB] (2023) focuses on empowering smallholders through cooperative structures most notably Amul offering valuable lessons in governance, member engagement, and scale (Kurien, 2012; NDDDB, 2023). Conventional assumptions regarding the trade-offs between performance and participation are challenged by the NDDDB cooperative model, which shows that democratic governance frameworks are capable of simultaneously achieving enormous scope and economic efficiency.

Other models, such as the UK's Agriculture and Horticulture Development Board (AHDB), Thailand's community-led initiatives, and Indonesia's state-owned PT Berdikari, reflect diverse approaches with varying degrees of success (AHDB, 2022; PT Berdikari, 2020; Thai Feedlot Association, 2021). The variation is indicative of the fact that the efficacy of institutions is contingent upon the congruence of governance frameworks with contextual variables such as economic growth degrees, political structures and stakeholder configurations.

Global livestock development models provide essential frameworks for improving governance, sustainability, and innovation within the beef and dairy industries. Australia's Meat & Livestock Australia (MLA) is a prominent example of a statutory levy-funded organization that channels investments into research, development, and market expansion. Operating under the oversight of the Department of Agriculture, Fisheries and Forestry (DAFF), MLA ensures industry-wide accountability and transparency in strategic execution. Its success lies in structured coordination between stakeholders and effective reinvestment mechanisms that continually enhance the livestock value chain (DAFF, 2023; MLA, 2024). MLA's enduring success serves as an illustration of how institutional architecture can establish self-reinforcing mechanisms for continuous sector development by generating returns that finance further improvements through coordinated investments.

Ireland offers another effective model through its dual-agency approach, comprising Bord Bia and the Irish Cattle Breeding Federation (ICBF). Bord Bia specialises in strategic marketing and international branding, while ICBF focuses on genetic data integration and performance monitoring. These organizations have elevated Ireland's global reputation in dairy and beef exports by ensuring traceability, productivity, and consumer trust. Their collaboration demonstrates the importance of aligning data-driven innovations with marketing efforts to strengthen overall industry competitiveness (Bord Bia, 2023; ICBF, 2022). Bord Bia and ICBF's synergistic relationship serves as an illustration of how institutional complementarity can generate competitive advantages that surpass the aggregate of individual organizational contributions, thereby illustrating the strategic significance of coordinated specialization.

India's livestock sector, particularly the dairy industry, has been shaped by cooperative movements spearheaded by the National Dairy Development Board [(NDDDB] (2023). Through initiatives like Amul, NDDDB has successfully empowered smallholder farmers by facilitating collective ownership, access to technology, and value-added processing. This governance model highlights how cooperative structures can scale up productivity and ensure inclusive growth, especially in developing economies. India's success underscores the need for organizational strategies that integrate digital tools with grassroots participation (Kurien, 2012; NDDDB, 2023). The capacity of institutional design to reconcile the tension between financial effectiveness and societal fairness is demonstrated by NDDDB's success in scaling cooperative governance while maintaining democratic control. This model offers an appealing option to market-dominated models of development.

Other countries provide additional perspectives. The UK's Agriculture and Horticulture Development Board (AHDB) promotes data transparency and market intelligence, while Thailand leverages community-driven feedlot initiatives and Indonesia relies on state-owned enterprises like PT Berdikari for beef production. These diverse models showcase varying degrees of government intervention, stakeholder collaboration, and innovation in achieving food security and market resilience. Malaysia can

draw on these experiences to design a hybrid model that integrates digital marketing strategies with institutional support and community engagement (AHDB, 2022; Thai Feedlot Association, 2021; PT Berdikari, 2020). The disparity in achievement rates among such models indicates that institutional efficacy is contingent upon an ideal combination of the ability of the state, market structures, and engagement from stakeholders, rather than a strict adherence to a solitary governance ideology.

## Methodology

This study employs a qualitative case study approach focusing on MLA's operational model. Data were compiled from official documents, policy reports, peer-reviewed literature, and organizational records from MLA, DAFF, ICBF, and other livestock agencies. A comparative analytical framework was developed to evaluate governance, funding mechanisms, traceability systems, and stakeholder engagement. The case study approach facilitates an in-depth examination of intricate institutional phenomena in their natural settings, offering insights into causal processes and implementation dynamics that quantitative methods fail to capture.

To assess model suitability, Malaysia's production structure dominated by smallholders and informal trade networks was used as a reference. The evaluation considered inclusive, scalability, policy coherence and technological adaptability. The contextual footing guarantees that organizational evaluation is rooted in Malaysian reality instead of abstract conceptual beliefs, hence improving the practical relevance and practicality of implementing suggestions.

## Results and Discussion

### Structure and Operations of MLA

MLA's funding model is based on compulsory transaction levies collected at various points in the supply chain. The cattle levy of AUD 5.00 per head is split between marketing, R&D and bio security. These funds support strategic initiatives including genetic improvement, feed efficiency research, market access facilitation, and traceability systems (Beef Central, 2023). The mandatory levy system addresses the traditional free-rider dilemma in the provision of public goods by guaranteeing universal involvement and generating reliable income sources that facilitate long-term strategic planning, irrespective of political cycles.

In private transactions (e.g., direct breeder-to-feedlotter sales), the seller is obligated to self-report and pay the levy, underpinned by regulatory enforcement. This transparent mechanism ensures continuity of development programs without relying solely on government budgets. The self-reporting requirement illustrates how institutional design may broaden governance into informal market sectors while preserving transaction flexibility, necessitating advanced compliance systems that reconcile regulatory supervision with market efficiency.

In Australia, statutory levy collection in the ruminant industry is a legally mandated process that ensures consistent funding for industry development across the entire value chain. The system is administered by the Department of Agriculture, Fisheries and Forestry (DAFF) through its Levies Revenue Service. A fixed levy such as AUD 5.00 per head of cattle is imposed at the point of sale, whether through agents, saleyards, processors, or private transactions. In the case of direct breeder-to-feedlotter sales, producers are required by law to self-report and remit the levy. These funds are then distributed to organisations like Meat & Livestock Australia (MLA) to finance research, development, marketing, biosecurity, and traceability initiatives. The statutory nature of the levy ensures transparency, enforcement through penalties for non-compliance, and equitable contribution by all market participants, thus fostering sustained improvements in productivity and market access across the livestock industry. This extensive legal framework demonstrates how legitimate mandates, coupled with administrative capabilities, can establish an institutional structure that resolves voluntary cooperative action issues, showcasing the

efficacy of institutional design in addressing shortcomings in the market.

### Comparative Analysis of International Models

Ireland (ICBF & Bord Bia) emphasizes genetics, traceability, and export-oriented branding. Its strong integration of databases and farmer participation makes it ideal for improving productivity and quality assurance. This integration depicts how institutional design may foster synergies between data systems and stakeholder involvement, producing network effects that enhance the advantages of individual components.

India (NDDDB) empowers rural farmers through cooperatives, demonstrating successful scaling and governance. While less relevant for beef, it offers lessons for Malaysia's dairy and goat sectors. The UK's AHDB focuses on knowledge transfer and policy alignment. However, its bureaucratic structure may not resonate with Malaysia's grassroots stakeholders. Thailand's programs are community-based but suffer from coordination issues, while Indonesia's state-led model lacks the flexibility and transparency needed for market-driven reforms. The divergent results indicate that institutional success relies on aligning governance systems with domestic stakeholder demands, political climate, and market features, rather than only focusing on abstract effectiveness.

Ireland's ruminant governance model, represented by the collaboration between Bord Bia and the Irish Cattle Breeding Federation (ICBF), emphasizes a high degree of data integration, traceability, and export-oriented branding. Bord Bia excels in marketing and international positioning, while ICBF provides cutting-edge genetic data and productivity benchmarks. This synergistic model fosters both quality assurance and competitiveness in global markets. For Malaysia, adopting a similar dual-institution framework one focused on market access and branding, and the other on genetic and farm performance data could elevate the nation's beef and dairy sectors. However, successful implementation would require substantial investment in farmer education and national data infrastructure to ensure traceability and participation. The success of the Irish model suggests that institutional specialization may provide a competitive edge through concentrated knowledge, necessitating a robust backbone of support and underscoring the systemic significance of efficient governance execution.

India's National Dairy Development Board [NDDDB] (2023) offers a contrasting approach centered on rural empowerment through cooperatives. Although its model is primarily dairy focused and less applicable to beef due to religious and cultural considerations, it presents valuable lessons for Malaysia's smallholder driven dairy and goat farming sectors. NDDDB's ability to scale up cooperative governance while maintaining farmer loyalty and efficient logistics highlights the potential of community ownership models. For Malaysia, integrating cooperative frameworks with digital platforms and cold-chain logistics could empower small farmers, particularly in Sabah and Sarawak, thereby enhancing inclusive and rural income stability. NDDDB's scaling success reveals that democratic governance frameworks may uphold legality and efficacy on a broad basis, contesting the presuppositions regarding the constraints of organizational size in participatory management systems.

The United Kingdom's Agriculture and Horticulture Development Board (AHDB) prioritizes knowledge transfer and policy coherence. Its strength lies in aligning research outputs with industry needs and government strategies. However, its centralized and somewhat bureaucratic model may not align with Malaysia's more fragmented agricultural landscape, where bottom-up participation is crucial. Nevertheless, AHDB's structured approach to evidence-based policy making and sectoral intelligence can inform Malaysia's institutional reforms, especially in creating sector-wide road maps and funding mechanisms for ruminant development. The experience of AHDB highlights that knowledge-based governance models necessitate a high level of administrative capacity and stakeholder approval of centralized expertise. This underscores the importance of cultural alignment with governance philosophies in determining institutional effectiveness.

In contrast, Thailand and Indonesia represent models that Malaysia should analyse with caution. Thailand's community-based programs show promise but often face challenges related to inter-agency coordination and funding consistency. Meanwhile, Indonesia's state-owned enterprise model, such as

PT Berdikari, illustrates the limitations of centralized control in a dynamic, market-driven environment. Both cases underscore the need for Malaysia to strike a balance between public sector oversight and private sector agility. A hybrid governance model combining Ireland's data-driven structure, India's cooperative ethos and the UK's policy integration tailored to Malaysia's socio-economic context, could offer a more sustainable pathway for strengthening its ruminant industry. Those cautious illustrations underscore the critical importance of balanced governance architectures that optimize both efficiency and responsiveness, as they illustrate how institutional design failures whether through coordination deficits or excessive centralization can undermine development objectives.

### Challenges in Malaysian Ruminant Industry

Multiple agencies are involved in Malaysia's beef sector, including the Department of Veterinary Services (DVS) (2023), Malaysian Agriculture Research and Development Institute (MARDI), Ministry of Agriculture and Food Security (MAFS), various state-level authorities, government corporations and government-linked companies (GLC's). The absence of a central coordinating body has led to duplication of efforts and inconsistent policy implementation. Farmers' representation remains weak, and producer cooperatives are fragmented. Gaps in governance of traceability, data management, provision of government financial and non-financial support, performance measurement and enforcement of standards have further constrained the industry growth. The systemic costs of governance vacuum in complex policy domains are illustrated by the institutional fragmentation, which exemplifies how the dearth of coordinating mechanisms creates negative externalization through duplicated efforts and strategic incoherence.

Malaysia's informal livestock markets lack standardized documentation, registration, and traceability. Many transactions occur without intermediaries or agents, complicating the implementation of a self-reported levy system. Smallholders often lack awareness of regulatory requirements, and enforcement capacity is limited. Institutional underdevelopment in documentation and traceability systems fosters fundamental barriers to the implementation of modern governance mechanisms, as evidenced by the prevalence of informal market structures. This necessitates adaptive approaches that gradually formalize market practices while respecting existing transaction patterns.

### Recommended Ruminant Industry Governance for Malaysia

Malaysia's fragmented beef industry would benefit from a hybrid governance framework integrating the core strengths of various models based on the following criteria:

- i. **Centralize Coordination:** Establish a dedicated industry authority (inspired by MLA) for a long-term comprehensive approach in industry development and management, strong and effective market development and world world-renowned traceability system. This centralized approach will address the coordination deficiencies that presently hinder sector growth while fostering institutional capacity for strategic planning and resource allocation along the whole chain of value.
- ii. **Industry Representation:** Institutionalize legally recognized players of the industry, including farmers organization, to amplify farmers' voices, especially smallholders, in policy issues and pricing determination. Other players such as importers, traders and butchers/processors may be included to ensure inclusiveness in industry representation. This inclusive representation approach will rectify existing legitimacy deficiencies while establishing democratic governance frameworks that equilateral varied stakeholder interests and avert domination by predominant economic entities.
- iii. **Producers' Cooperative Revitalization:** Strengthen cooperatives, such as existing dairy farmers' cooperatives to deliver integrated input, finance, and marketing services. The revitalization plan would construct institutional infrastructure for collective action by leveraging existing social capital. This would grant smallholders access to larger markets and economies of scale that are not available to individual producers.

This hybrid approach is a sophisticated institutional design which strategically integrates complementary governance structures to address Malaysia's distinctive combination of smallholder dominance, ethnic diversity, and federal political structure, transcending the limitations of a single model.

## Conclusion

Malaysia's aspiration to become a self-sufficient and competitive ruminant producer requires transformative reforms grounded in global best practices. While the MLA model offers a robust framework, local adaptation is critical. A hybrid structure integrating levy governance, genetic data systems, and cooperative outreach. This transformative imperative demonstrates the necessity of political commitment and stakeholder buy-in for fundamental governance restructuring, as effective institutional development necessitates comprehensive reform rather than incremental refinements.

This institution would serve as a central platform for channeling resources, fostering innovation, and improving traceability. By embedding inclusive, transparency, and sustainability into its design, can elevate Malaysia's livestock sector to meet both domestic and international demands, particularly in the halal market. Institutional design can establish coordination mechanisms that generate synergistic benefits that surpass the contributions of individual components, while concurrently addressing multiple market defects through integrated governance solutions. This is illustrated by the platform function.

The genesis of a Malaysian Ruminant Industry Corporation signifies not only institutional change but a strategic reconfiguration of how emerging states might overcome structural constraints via innovative governance adaptations. By integrating the levy-based sustainability of Australia's MLA, the cooperative inclusive of India's NDDB, and the market-driven precision of Ireland's dual-institution model, Malaysia can establish a governance framework that addresses its immediate food security issues while positioning the country as a leader in halal livestock production in the global market. The efficacy of this hybrid institutional architecture will ultimately hinge on the political fortitude to enact comprehensive change, the sagacity to reconcile efficiency with equality, and the dedication to uphold a long-term goal despite immediate implementation obstacles. At this pivotal moment, Malaysia's decision between further fragmentation and unified transformation will dictate whether the ruminant industry evolves into a national asset or continues to be a chronic weakness in a more food-insecure environment.

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**Data Availability Statement:** All relevant data are within the manuscript and its [Supporting Information](#) files.