



Current Scenarios and Challenges in Animal Husbandry SMEs in Sarawak

A Service-Learning Perspective



Editors

Chung Hung Hui · Melinda Lau Mei Lin

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Dedication

This work is dedicated to the resilient and passionate individuals who form the backbone of Sarawak's Animal Husbandry SMEs. Your commitment to the well-being of animals, sustainable practices, and the local community has been a true inspiration. May this book contribute to the enhancement of your endeavours and shed light on the challenges and opportunities that lie ahead.

Special thanks to my family and friends for their unwavering support and encouragement throughout this service-learning journey. Your belief in my abilities has been a driving force, and I am grateful for the love and understanding you have provided.

To the Professors, Associate Professors, and service-learning partners who have shared their expertise and experiences, thank you for guiding me on this path of discovery. Your insights have enriched the depth of this study and shaped my perspective. Not to forget the students who enrolled in STB2192 Animal Biotechnology course that have struggled much to get the interviews done.

This work is dedicated to the spirit of collaboration and continuous learning. May it serve as a humble contribution to the betterment of Animal Husbandry SMEs in Sarawak.

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Navigating Challenges in Sarawak's Quail Farming Industry

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*Riesshen Singh, Amir Haikal bin Mohd Muzni, Claudina Rinya anak Abu, Husna binti Fathi,
Ashby Sunang bin Maseri & Chung Hung Hui*

Quail Farming

Alternative Protein Source in Malaysia Meat Supply Chain
Biotechnology becomes an important force in poultry husbandry, greatly improving quail populations' production, health, and breeding. By investigating biotechnology insights in quail husbandry, the distance between theory and actual practice in poultry farm operations is reduced. Scientifically known as *Coturnix coturnix*, quails are becoming increasingly valuable for their nutritional and economic benefits, which has led to an increase in quail farming (Figure 8.1) (Rahman et al. 2016).

The use of biotechnological innovations, which include genetic engineering, disease resistance, and improved breeding techniques, is essential for maximizing quail farming production and sustainability. These developments are critical for the agriculture industry as well as for tackling more general issues related to food security. Genetic improvement is the first significant effect of biotechnology in quail farming. Breeds of quail with

certain desirable traits have been developed in Malaysia thanks to biotechnological treatments. These include greater tolerance to environmental stressors and local illnesses, faster growth rates, better quality meat and eggs, and improved feed efficiency. The usage of genetic markers for detection and reproduction of these desirable traits are growing, aiming to increase total quail production (Shah & Çetingül, 2022).

Biotechnology is a key factor in improving feed efficiency and nutrition in Malaysian quail farming. Quail diet optimization is the focus of cutting-edge research, which seeks to reduce feed expenses while enhancing growth rates and egg yield. In Malaysia, according to the East Coast Economic Region secretariat, demand for quail has risen by 20-25% annually since 1995 parallel with the rise in global demand for quail. In Abu Dhabi, quail farm currently produces 50,000 quails per week will need to **more than** triple its production to meet customer demand. The gradual increase in chicken prices since March 2022 has caused the demand for quails to increase. In an interview with New Straits Times, quail farmer, Rosnizam Md Noor, 46, had to double his efforts to produce 12,000 quails per month due to soaring chicken prices. He stated that his current production rate far exceeds his previous output of 7,000 to 8,000 birds per month before March 2022. Despite reaching 12,000 birds per month, he still cannot meet the demand (NST, 2022).

The implementation of specialized diets fortified with essential vitamins, minerals and probiotics has led to significant improvement in quail health and productivity. Given that feed costs constitute a substantial portion of production expenses in Malaysia, this emphasis on diet optimization holds particular importance (Das et al. 2023). By reducing environmental impact and boosting resource efficiency, biotechnology-based feed development not only meets the nutritional demands of quails but also promotes sustainable agricultural methods.



Figure 8.1: Quail farming at Nuet Puyuh, Sarawak

The introduction of biotechnological advancements has revolutionized farm operations in Malaysia, leading to notable improvements in sustainability and efficiency. Automated technologies for feeding, egg collection and environmental management have reduced labor costs and increased farm productivity. Additionally, the utilization of data analytics and real-time monitoring enables informed decision-making regarding resource allocation, breeding, and health care. The utilization of technology in this manner not only boosts output but also promotes environmentally friendly farming methods, setting up the Malaysian quail sector for future expansion and flexibility (Figure 8.2) (Javaid et al. 2022).



Figure 8.2: Quail eggs collected beside the female chicks cage ready for collection.

Overall, the multifaceted impact of biotechnology on genetic improvement, nutrition, disease control, environmental sustainability, and economic viability in quail husbandry in Malaysia is indeed undeniable. This shift is not only crucial for the national agricultural economy but also for the growth and sustainability of the quail farming industry. Continued investment in biotechnology research and development is essential to sustain this momentum and ensure the long-term prosperity of the quail industry.

Quail Farming: The Unpopular Choice in Poultry Farming

Running a quail farm in Sarawak poses numerous challenges, both internal and external, requiring a deep understanding of quail behavior and meticulous business preparation. Disease outbreaks, inadequate housing conditions, fluctuating market

demands and specialized knowledge served as the primary factors in quail industry across Sarawak. Firstly, disease outbreaks would pose a significant threat to the quail farm, potentially disrupting the quail supply chain. Diseases including Newcastle disease, though not prevalent in Sarawak, can devastate quail populations worldwide as it is highly infectious and contagious (Gowthaman et al. 2013). Despite the efforts made to combat diseases using natural remedies like herbs, there remains a risk of outbreaks undermining sustainability and economic viability.

Secondly, inadequate housing conditions hinder quail farm's success (Figure 8.3). Optimal housing contributes to quail well-being and egg quality. Research had indicated different housing system would impact egg characteristics, highlighting the importance of proper housing for both quail health and production quality (Galić et al. 2021). For instance, larger and heavier eggs are produced within cage housing system while the aviary housing system produce eggs with greater shell content and strength. Previous study conducted by UPM on the potential environmental impact from quail farm found that the contributions of process were dominated by electricity and feed production. The contribution of electricity consumption to environmental impacts derived from the farm was high, ranging from 5% in abiotic resource depletion potentials (ADP) to 61% in ozone depletion potential (ODP) (Sharaai et al. 2015).

Thirdly, fluctuating market demands present challenges for quail farmers, especially during events like Covid-19 pandemic. Some of the challenges faced during the pandemic includes increasing feed cost, reduced demands, transport chain closure and labor shortage. Market fluctuations affect production costs and income, necessitating a nuanced understanding of the industry trends and news to navigate efficiency.



Figure 8.3: A simple wooden quail chicks caging setup equipped with a tungsten lamp for providing warmth to the chicks at growth stage.

Lastly, specialized knowledge in quail husbandry is essential for success. Farmers must grasp quail requirements, breeding conditions, nutrition, health management to ensure optimal production. Utilizing practical housing methods, like cages can enhance breeding outcomes and streamline egg collection (Chang et al. 2010). By understanding the needs of the quail industry, the production is able to expand further. In conclusion, by addressing these challenges with informed decision-making and industry-specific knowledge, quail farms can mitigate risks and sustain economic stability. While the problems may persist, proactive management and understanding of the quail industry enable effective solutions.

In terms of trainings, Department of Agriculture Sarawak offers training programs and workshops on various aspects of poultry farming, including quail farming. These programs often cover topics like animal husbandry, farm management, and disease control. Other than that, Sarawak Veterinary Services Department (DVS) also provides resources and training on animal health, including disease prevention and biosecurity measures for quail farming. Occasionally, educational institutions like Universiti Malaysia Sarawak (UNIMAS) and other local universities may offer courses or extension programs related to agriculture and animal science. Collaboration with research centers such as the Malaysian Agricultural Research and Development Institute (MARDI) can provide farmers with access to the latest research, innovations, and technologies in quail farming.

Interview Session with NUET Puyuh

The primary objective of quail farming in Malaysia revolves around the production of quail eggs and meat. Among the prominent entities in this sector is NUET Puyuh, located at No. 30, Kampung Sri Tajo, 94600 Asajaya, Sarawak. Since 2019, they had been actively involved in breeding and supplying quails, offering a wide range of products and services, including processing quail meat (frozen), eggs and young chicks. Mr. Abdul Aziz bin Mat, the owner, emphasizes the adoption of Japanese quail (*Coturnix japonica*) as the primary breed in their farm due to its early maturity and ability to lay eggs as early as 6- to 8-week-old. Despite being smaller in size than other breeds, Japanese quails are preferred for their tender and flavorful meat. Female chicks are favored in quail farming for their consistent egg production throughout the year. Mr. Abdul Aziz distinguishes male chicks by their rusty brown neck and breast feathers, while female chicks have lighter cream-colored neck feathers with black stripes and dots on the breast (Figure 8.4).

In terms of market value, quails are priced at approximately RM 24 per kilogram compared to broilers at RM 16 per kilogram. Quails exhibit rapid maturity, with female chicks expected to start laying eggs at 6- to 8-week-old, whereas layers usually begin at 24-week-old, yielding over 300 eggs annually without intervention. Another advantage of quail farming is the possibility of processing chicks for slaughter at 6-week-old without significant weight difference compared to older ages.



Figure 8.4: Biotechnology students listening attentively to the explanation given by Mr. Abdul Aziz (in orange cloth) on the setting up of Nuet Puyuh.

Successful quail farming involves several critical stages, including incubation, growth and transfer. During incubation stage, maintaining an optimal temperature at around 37 °C is essential for embryo development and hatching success, typically lasting

from 16 to 18 days. In the growth stage, providing a suitable environment with temperature-controlled brooders ensure efficient growth until maturity, quails are transferred to gender-specific living spaces to control breeding effectively (Figure 8.5). Providing suitable nesting areas for laying eggs is essential in the female section, while the male section should be designed to prevent aggression and promote overall well-being.



Figure 8.5: UNIMAS Biotechnology students helping Mr. Abdul Aziz on segregating the quail chicks based on their gender.

Mr. Abdul Aziz implements the use of papaya leaves in his farming practices for disease control. Papaya leaf extract is valued for its immunomodulatory properties and rich content of bioactive chemicals, including flavonoids and polyphenols, which combat harmful free radicals. The extract is incorporated into the quail diet or provided through drinking water, with dosage and frequency adjusted based on various factors including age, health and environmental conditions. Previous study published in the *Ceylon Journal of Science* have demonstrated that papaya leaf extracts have significant anthelmintic activity against gastrointestinal nematodes in goats (Ameen et al. 2018). Another study in the *Parasite Vectors* journal also indicated that papaya latex (extracted from leaves) reduced the fecal egg count of gastrointestinal parasites in sheep (Buttle et al. 2011). However, similar effect has not been verified in quail farming.

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Current Scenarios and Challenges in Animal Husbandry SMEs in Sarawak: A Service-Learning Perspective delves into the dynamic and evolving landscape of small and medium-sized enterprises (SMEs) in animal husbandry within Sarawak, Malaysia. This comprehensive manuscript explores the intersection of traditional farming practices, modern animal biotechnology, and sustainable development, offering a unique service-learning perspective on the challenges and opportunities faced by local farmers and entrepreneurs.

From innovative sheep farming management in Kuching to the application of biotechnology in the cattle and aquaculture industries, each chapter provides in-depth case studies and research findings. Topics such as the commercialization of goat farming, the demand for free-range poultry, and the sustainable development of seawater prawn farming highlight the diverse facets of animal husbandry in Sarawak. The book also addresses critical issues such as supply chain management, quality control, and the integration of biotechnology to enhance productivity and sustainability.

With contributions from a team of dedicated researchers and practitioners, this manuscript serves as a valuable resource for academics, industry professionals, and policymakers. It not only sheds light on the current state of animal husbandry SMEs in Sarawak but also offers actionable insights for overcoming challenges and driving growth in this vital sector.



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