



DESIGN OF YASMIN FARM DAIRY CATTLE FARMING AREA IN PURWOREJO

Rizal Maksum^{1)*}, Heri Hermanto²⁾, Hermawan³⁾

¹⁾²⁾³⁾ Universitas Sains Al-Qur'an, Indonesia

¹⁾rizalmaksum@gmail.com, ²⁾herih@unsiq.ac.id, ³⁾hermawan@unsiq.ac.id

*rizalmaksum@gmail.com

Submitted :14 Oktober 2025 | **Accepted** : 26 Oktober 2025 | **Published** : 31 Oktober 2025

Abstract: This study proposes the design of an integrated dairy farming area at Yasmin Farm, Purworejo, to optimize land use, safeguard animal welfare, and enhance operational efficiency. A mixed qualitative–quantitative design approach was adopted, combining literature review, comparative case observations of reference farms, on-site surveys, and a space-requirement analysis that informed the layout of barns, milking facilities, feed storage, and waste-handling units. The planning embeds green-design strategies—natural ventilation and daylighting, water harvesting, resource-efficient circulation, and staged waste valorization (composting/biogas)—alongside appropriate automation for herd monitoring and milking. The resulting scheme organizes the estate into clear functional zones (production, support, education–tourism, and utilities) to minimize cross-contamination risk, shorten process flows, and improve worker safety. Expected benefits include more stable milk quality and capacity, reduced environmental footprint, and opportunities for education and community engagement. The work’s novelty lies in a context-specific, medium-scale dairy farm blueprint that couples spatial programming with sustainability and edutourism functions, offering a practical model for Central Java and similar tropical settings.

Keywords: Dairy farming, area design, Yasmin Farm, sustainability

1. INTRODUCTION

Indonesia's dairy farming industry holds significant potential, both in terms of natural resources and market demand. As an agricultural country with vast land area and a favorable tropical climate, Indonesia has significant opportunities to develop the livestock sector, particularly in milk production. Currently, domestic milk production is unable to meet the growing demand from the Indonesian public, resulting in significant milk imports. This situation opens up significant opportunities for the development of dairy farming in various regions of Indonesia to increase domestic milk production and reduce dependence on imports (Nofianti et al., 2022).

Central Java, as a province with significant potential in the livestock sector, plays a crucial role in increasing national milk production. This province boasts several advantages, such as extensive land availability, a favorable climate, and adequate infrastructure and market access. The local government also actively provides support through programs to improve the capacity of farmers, including in cultivation techniques, farm management, and product marketing. With this potential and support, developing dairy farming areas in Central Java is highly relevant to efforts to increase national milk production (Prayogo et al., 2023).

In Purworejo Regency, the latest data shows that the dairy cattle population has reached approximately 2,500 head, with an annual milk production of approximately 1,500 to 2,000 tons. Average milk production per cow can reach 15-20 liters per day. Demand for fresh milk in Purworejo and the surrounding area continues to increase,





along with the development of the milk processing industry and increasing public awareness of the importance of milk consumption. The livestock sector, including dairy farming, has significant potential for development. Purworejo has ideal geographic and climatic conditions for dairy cattle farming, as well as the support of experienced human resources in the livestock sector. Furthermore, its proximity to major cities such as Yogyakarta and Solo makes Purworejo a strategic location for dairy farming development. Purworejo's natural potential can be maximized by developing an integrated and sustainable dairy farming area (Priyanto et al., 2018).

Yasmin Farm, one of the dairy farms in Purworejo, has great potential to be developed into a modern livestock area that can increase milk production capacity and quality. The development of this area aims not only to increase milk production but also to become an educational center and livestock tourism destination that can attract public interest in learning more about the dairy industry. By implementing sustainable livestock farming concepts, Yasmin Farm is expected to have a positive impact on the local economy and create new job opportunities for the surrounding community (Firmawan, 2012). Perancangan kawasan memerlukan alur sirkulasi yang matang (Nugroho et al., 2023).

Therefore, the design of the Yasmin Farm dairy farm in Purworejo is a strategic step in supporting increased national milk production and the development of the livestock sector in Indonesia, particularly in Central Java. With proper design, this area is expected to become a model for modern, efficient, environmentally friendly, and competitive livestock farming, as well as making a significant contribution to food security and the well-being of the local community.

2. METHOD

This research uses a structured area design method, aiming to design and develop a dairy farm that is efficient, comfortable, environmentally friendly, and supports sustainability. This approach allows for the design of an area that not only meets functional needs but also considers livestock welfare and environmental sustainability. Furthermore, this research integrates several analytical methods to deepen the farm design. Literature review is one method used, gathering information related to farm design from various sources, including comparative studies with other farms, both established and those with similar characteristics. The purpose of this comparative study is to examine the successes and challenges faced by other farms in managing their dairy farms, so that these findings can be applied or adapted to the design of Yasmin Farm. Field surveys are also a crucial part of this research, involving direct observations at Yasmin Farm and visits to other operating dairy farms. Through field surveys and comparative studies, data related to the management of space, facilities, and technology used by other farms will be obtained, providing the best reference for designing a more efficient and sustainable farm. This combination of comparative study-based design and field analysis allows for a more comprehensive area design that adopts proven best practices. Analysis of space requirements is a crucial aspect in designing the dairy farm area at Yasmin Farm. Optimal spatial planning encompasses facilities such as barns, milking areas, waste management, and other supporting infrastructure. Barn facilities must be designed with livestock comfort in mind, including sufficient space, good air circulation, and optimal lighting. The milking area needs to be arranged with easy access to the milk storage barn and an adequate sanitation system. Waste management must include space for processing organic and liquid waste using environmentally friendly systems. Furthermore, supporting infrastructure such as administrative space and worker housing also needs to be considered to ensure smooth and efficient operations. Yasmin Farm is designed as an educational and tourism center, requiring specialized facilities for education and farm tourism. The use of modern technology in livestock monitoring and automation of the milking process is also crucial to improve operational efficiency. The entire design of this area must adhere to sustainability principles, including the use of renewable energy, rainwater management, and energy-efficient building design. By considering all these aspects, Yasmin Farm is expected to operate optimally, providing significant benefits to the livestock, managers, and the surrounding community, while contributing to environmental conservation.

3. RESULT AND DISCUSSION

Dairy farming is a business that aims to raise productive female cattle to produce milk as its primary product. Activities carried out on this farm include livestock care, feeding, milking, and waste management. To produce high-quality milk, it is important to pay attention to feed management, animal health, and environmental conditions. According to Siregar, dairy farming is a farming business that utilizes female cattle to produce milk, which is then processed and marketed. To ensure good milk quality, this type of farming requires effective management, with attention to feed, barn management, and disease management that can affect production.





Beyond technical aspects, dairy farming also encompasses business management, including production planning, cost management, and marketing. Tohir explained that dairy farming is not just about cultivation, but also an economic activity that adds value through milk processing and distribution. The success of this business depends heavily on the farmer's ability to manage practices efficiently and in accordance with livestock farming standards.

From a sustainability perspective, dairy farming also considers environmental, social, and economic aspects. Susanti and Rahayu explained that sustainability in dairy farming includes wise natural resource management, the application of environmentally friendly technologies, and improving the welfare of farmers and the surrounding community. These aspects are crucial to ensuring that livestock farming can operate sustainably without damaging the environment or neglecting social welfare.

Overall, dairy farming is a complex system encompassing milk production, livestock management, environmental stewardship, and economic sustainability. With proper management, dairy farming can be a significant source of income for farmers and contribute to meeting domestic milk demand. In this regard, the scope of a dairy farming area includes facilities that support various operational activities, such as milking parlors, livestock barns, feed storage, and waste management. Each facility has a specific function that is essential to maintaining the efficiency and sustainability of the farm.

The basic concept of designing a dairy farming area focuses on selecting a strategic location, providing adequate infrastructure, and providing facilities that support both functionally and aesthetically. Planning for this area must also consider sustainability aspects, by integrating environmentally friendly technologies, waste management, and efficient use of resources. With careful planning, a dairy farm can not only support quality milk production but also provide economic, social, and environmental benefits to the surrounding community.

The dairy farm area encompasses various facilities that support efficient and sustainable farm operations. These facilities include a Company Landmark as the area's visual identity, a Main Gate Guard Post for access control and supervision, a parking area for staff and visitor vehicles, a Management Office as the administrative and operational center, and a milking parlor equipped with automated milking machines and a sterilization system. In addition, the area will include a Milk Cooling Building for temperature-controlled fresh milk storage, a Boulevard and Cow Sculpture as aesthetic elements, an Employee Mess for worker accommodation, and a prayer room as a place of worship. Equipment and Feed Warehouses will be available for storing tools and feed, while pens for lactating cows, heifers, and calves will be arranged according to livestock production conditions.

The area will also provide waste management facilities, such as a composting and grass cutting facility, as well as a grass garden as a source of feed with an irrigation system. In addition, sanitation facilities such as toilets and a rear gate guard post will ensure cleanliness and proper supervision. The Electrical Installation Center and Wastewater Treatment Plant (WWTP) will support energy and wastewater management, while a Temporary Waste Disposal Site will assist with waste management.

The basic concept of planning the milking and education center area encompasses several important factors. Strategic location selection is crucial in planning this area, taking into account transportation access, population density, and potential economic growth. Proper zoning, dividing the area into several zones with different functions, is also necessary to optimize land use. Adequate infrastructure, including roads, electricity, clean water, sanitation, and telecommunications, will support the smooth operation of this area.

Furthermore, the provision of supporting facilities such as shopping centers, hotels, restaurants, and banks will enhance the comfort and satisfaction of area users. Sustainability aspects must be an integral part of this area's planning, encompassing sustainable environmental, social, and economic management. The primary goal of this area's planning is to create an efficient, sustainable area that can support economic growth. By involving various stakeholders, such as the government, developers, entrepreneurs, and the community, it is hoped that this livestock area will provide long-term benefits for all parties involved.

The proposed layout for Yasmin Farm consolidates activities into four interlocking precincts—production, support, utilities—waste, and education—visitor—to balance efficiency, biosecurity, and community engagement while preserving a strict separation between clean and dirty flows. A one-way internal circulation shortens non-value-added travel for people, feed, and animals; the milking center sits near the site's internal spine to minimize walking distance and reduce pre-/post-milking stress, with service corridors that keep feed logistics from crossing the milk line and direct manure routes to digestion and composting areas. Open-sided barns with ridge vents, adjustable side openings, and diffuse skylights moderate the tropical microclimate and daylight conditions so that Thermal Humidity Index is expected to remain within the comfort band for most hours, with low-energy fans covering peak loads; space allowances, alley widths, water access, and shaded loafing zones are dimensioned to



support udder health, hoof hygiene, and steady intake. Within the milking center, clean-in/clean-out routines, pre-/post-dipping, closed milk lines to the bulk tank, and washable surfaces enable HACCP-style audits at critical points, aiming to stabilize milking intervals, shorten queues, and improve milk quality over time. Upwind siting of the feed mill and covered forage storage, coupled with slabbed mixing pads and direct service loops, reduces spillage and labor while supporting consistent dry-matter intake and milk-solids stability. Manure and wastewater are routed to an anaerobic digester, composting yard, and constructed wetland, turning liabilities into energy, soil amendments, and treated water, and thereby lowering odors, vectors, and the overall environmental footprint. A public-facing education and visitor area—comprising an orientation hall, viewing gallery, training room, and retail—allows learning and edutourism without compromising biosecurity through controlled visual access. The implementation sequence prioritizes core production and hygiene upgrades, then utilities and waste-to-resource systems, followed by edutourism features, enabling early operational gains with prudent capital staging. While the present work is design-led and emphasizes spatial logic rather than long-horizon metrics, the scheme outlines clear pathways for instrumented validation of microclimate, energy and water balances, milk quality indicators, and labor efficiency, and it can be adapted to similar medium-scale tropical dairy contexts.

4. CONCLUSION

The conclusion of the design of the Yasmin Farm dairy farm in Purworejo is to create a modern, efficient, environmentally friendly, and sustainable farm, with the primary goal of producing high-quality milk. The design of this area focuses on efficient use of resources, environmental sustainability, and the welfare of livestock and workers. Facilities at Yasmin Farm are designed in an integrated manner, grouped by function, such as production facilities, storage, and livestock areas, which support efficient workflows and minimize the risk of contamination. Sustainability principles are applied in various aspects, such as waste management by utilizing biodigesters for biogas, and the use of green areas for animal feed sources. This area also has the potential to become an educational tourism destination, which not only benefits the surrounding community but can also improve the welfare of local farmers. Thus, Yasmin Farm is expected to become an example of a modern farm that contributes to national food security and supports the regional economy. Overall, Yasmin Farm prioritizes the principles of sustainability, education, and the welfare of the local community, making it a model for modern and sustainable farming. Based on the design results of the Yasmin Farm dairy farm in Purworejo, several recommendations are provided to support the development and implementation of this area. To improve operational efficiency, it is recommended that Yasmin Farm continue to adopt the latest technologies, such as the use of sensors to monitor livestock health and automation in the milking process, to reduce reliance on manual labor. Furthermore, improvements to supporting infrastructure, such as better road access and an efficient feed distribution system, are also crucial.

5. REFERENCES

- Firmawan, F. (2012). Karakteristik dan Komposisi Limbah (Construction Waste) pada Pembangunan Proyek Konstruksi. *Majalah Ilmiah Sultan Agung*, 50(127), 1–10.
- Nofianti, S., Hanum, L., Raflis, H., & Salvia. (2022). Adopsi Teknologi Sapi Potong untuk Pengembangan Agribisnis Peternakan di Kabupaten Limapuluh Kota. *Jurnal Ekonomi Pertanian Dan Agribisnis (JEPA)*, 6(1), 154–163.
- Nugroho, A., Hermawan, & Hendriani, A. S. (2023). RESORT AREA WITH REGIONALISM ARCHITECTURAL APPROACH AND THERMAL COMFORT IN KLEDUNG TEMANGGUNG. *Clean Energy and Smart Technology*, 01(02), 48–57.
- Prayogo, S. A., Astuti, E. D., & Hidayat, M. (2023). Rancang Bangun Perangkat Kendali Pakan Ikan Jarak Jauh Dengan Metode Fuzzy Berbasis Internet of Things (Iot). *Biner : Jurnal Ilmiah Informatika Dan Komputer*, 2(1), 50–57. <https://doi.org/10.32699/biner.v2i1.4237>
- Priyanto, R., Syarifuddin, D., & Martina, S. (2018). Perancangan Model Wisata Edukasi di Objek Wisata Kampung Tulip. *Jurnal Pengabdian Kepada Masyarakat*, 1(1), 32–38. <http://ejournal.bsi.ac.id/ejournal/index.php/abdimas>