

Implementation of Biosecurity through Poultry House Disinfection in KUB Chicken Farming as an Initial Step toward a Zero-Waste Livestock System at Along Karya Farmer Group

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ABSTRACT: The sustainability of smallholder livestock farming largely depends on farmers' awareness of biosecurity and environmental management. Many rural poultry systems still lack adequate sanitation practices, leading to frequent disease outbreaks and productivity losses. This community service activity aimed to introduce and implement poultry house disinfection as an initial step toward establishing a **Zero-Waste Livestock System (TJP2)** among members of the Along Karya Farmer Group. The activity was conducted through several stages, including preparation, socialization, training, practical implementation, and evaluation. Farmers were trained on the importance of biosecurity, proper disinfectant preparation, and disinfection techniques suitable for KUB chicken production systems. The results showed a significant improvement in farmers' understanding of biosecurity and disease prevention. After the activity, participants demonstrated increased awareness and commitment to maintaining regular sanitation in their poultry houses. The disinfection process also created a cleaner and healthier environment, reducing odor and visible waste accumulation. This activity served as a practical and educational approach to strengthen community participation in sustainable livestock management. Moreover, it established the foundation for the broader TJP2 program, which integrates poultry production with crop cultivation to achieve a circular, zero-waste farming model. Overall, the activity contributed to improving animal health, environmental hygiene, and community empowerment through participatory biosecurity education.

KEYWORDS: biosecurity, disinfection, KUB chicken, zero-waste livestock system, community empowerment

INTRODUCTION

The livestock sector plays a strategic role in improving food security and the economic resilience of rural communities. In many developing regions, smallholder farmers rely on poultry farming as a primary or supplementary source of income (Adikara & Widyastuti, 2019). However, traditional livestock management systems often face multiple challenges, including limited access to technology, lack of knowledge about biosecurity, and inadequate waste management. These issues frequently lead to decreased productivity, higher mortality rates, and potential environmental contamination due to unmanaged livestock waste (Fatmona & Gunawan, 2022).

One of the most neglected but crucial aspects of poultry farming is biosecurity — a set of preventive measures designed to minimize the introduction and spread of infectious diseases among animals. In small-scale and community-based poultry operations, poor biosecurity practices such as improper waste disposal, lack of regular cleaning, and uncontrolled movement of people or animals in and out of the poultry area are still common. These conditions increase the risk of disease outbreaks, which can cause significant economic losses and undermine farmers' livelihoods (Al Biruni et al., 2025).

KUB chickens (Kampung Unggul Balitbangtan) are a superior native chicken breed developed to improve productivity and resilience in smallholder systems. They are well adapted to local environments, require relatively low input, and have good potential for meat and egg production. Despite these advantages, KUB chickens still face management challenges, especially in maintaining environmental hygiene and disease control. Many community groups that raise KUB chickens do not yet apply systematic biosecurity procedures, making their production systems vulnerable to infection and productivity decline (Masito et al., 2022).

Disinfection of poultry houses is one of the simplest and most effective biosecurity strategies to ensure the cleanliness of the rearing environment. Regular disinfection can reduce the population of pathogenic microorganisms, limit disease transmission, and provide a healthier environment for poultry. Educating farmers about the importance of this practice and demonstrating the correct method

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of disinfection is therefore a crucial step in improving the quality and sustainability of smallholder poultry production systems (Dalle et al., 2023).

This community service activity was conducted under the umbrella of the Zero-Waste Livestock System “Tanam Jagung Panen Protein (TJP2)” program at the Along Karya Farmer Group. The TJP2 concept aims to integrate poultry farming with crop production — specifically corn cultivation — in a circular system where livestock waste is utilized as organic fertilizer, and crop residues are processed into animal feed. This integration minimizes waste, reduces production costs, and supports environmental sustainability (Fitriany & Abidin, 2020).

As the first stage of the TJP2 implementation, a poultry house disinfection activity was carried out for KUB chicken farmers in the Along Karya Farmer Group. The activity served not only as a practical biosecurity intervention but also as an educational initiative to increase farmers’ awareness of disease prevention and hygiene management. Through this program, farmers are expected to adopt regular cleaning and disinfection practices as a standard procedure, thus strengthening the foundation for a sustainable zero-waste livestock system. Ultimately, the initiative is expected to contribute to improved animal health, increased productivity, and the enhancement of community welfare through environmentally friendly livestock management.

METHOD OF IMPLEMENTATION

This community service activity was carried out at the **Along Karya Farmer Group**, which consists of smallholder farmers actively engaged in poultry and crop production. The activity was conducted as the initial phase of the **Zero-Waste Livestock System “Tanam Jagung Panen Protein (TJP2)”** program. The method of implementation included several stages: preparation, socialization, training, practical implementation, and evaluation. Each stage was designed to ensure that farmers could understand, adopt, and sustain the practice of poultry house disinfection as part of their routine management system.

1. Preparation Stage

At the preparation stage, coordination meetings were held between the implementing team, local agricultural extension officers, and representatives of the Along Karya Farmer Group. The purpose of this meeting was to identify the existing conditions of poultry housing, determine the type of disinfectant to be used, and schedule the implementation process. The team also prepared educational materials such as posters, leaflets, and demonstration kits to support farmer learning during the training session.

2. Socialization and Education

Socialization activities were conducted to introduce the importance of biosecurity and disease prevention in poultry farming. During this session, the implementing team explained the concept of a **Zero-Waste Livestock System**, highlighting how proper sanitation contributes to sustainable and environmentally friendly production. The farmers were encouraged to discuss their current management practices and share the challenges they faced in maintaining poultry health and hygiene.

3. Training on Poultry House Disinfection

Training activities were conducted to demonstrate the correct procedures for poultry house disinfection. The materials covered included:

- The definition and purpose of disinfection in poultry farming.
- The types of disinfectants that are safe and effective for small-scale poultry systems.
- Preparation and dilution of disinfectant solutions according to recommended concentrations.
- Proper techniques for cleaning, spraying, and maintaining the poultry environment.

The training emphasized practical participation, allowing farmers to directly observe and perform the disinfection process using locally available materials. The activity also encouraged the use of affordable and eco-friendly disinfectants to ensure sustainability and local adaptability.

4. Implementation and Monitoring

Following the training, a collective disinfection activity was conducted in the poultry houses managed by the Along Karya Farmer Group. Farmers, assisted by the facilitators, carried out a thorough cleaning of the cages, feeding equipment, and surrounding areas before applying the disinfectant solution. The team supervised the process to ensure the correct use of disinfectant dosage and spraying technique. Monitoring was also performed one week after the activity to observe the cleanliness of the environment and gather farmers’ feedback on the effectiveness and practicality of the procedure.

5. Evaluation and Follow-Up Plan

An evaluation meeting was held after the implementation to assess the impact of the disinfection activity. The evaluation covered several aspects, including farmers’ understanding of biosecurity, changes in cage hygiene conditions, and the level of farmer participation. Based on discussions with the farmers, a follow-up plan was formulated to integrate routine disinfection and waste management into the ongoing **TJP2 program**. The team also identified potential future activities such as composting of manure, utilization of feed residues, and expansion of zero-waste practices to crop production systems.

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The method emphasized participatory and educational approaches, ensuring that the farmers were not only recipients of knowledge but also active participants in the process. By involving the community at every stage—from planning to evaluation—the activity aimed to build a sense of ownership and long-term commitment to biosecurity and sustainable livestock management practices.

RESULTS AND DISCUSSION

The implementation of poultry house disinfection at the Along Karya Farmer Group received a positive response from the local farmers. Prior to this activity, most poultry houses in the area had limited cleaning routines and minimal awareness regarding the importance of biosecurity. Farmers typically performed cleaning only when visible dirt accumulated, without understanding that pathogens could persist even in seemingly clean environments. After the training and direct demonstration, farmers began to recognize the importance of maintaining sanitation as a preventive measure against diseases such as Newcastle disease and fowl pox, which are common in backyard poultry systems.

1. Farmer Participation and Knowledge Improvement

A total of 20 farmers participated actively in the training and disinfection activity. During the initial session, several participants admitted that they had never used disinfectants in their poultry management routines. Through the participatory training method, farmers gained hands-on experience in preparing and applying disinfectant solutions correctly. The post-activity discussions revealed a significant improvement in farmers' understanding of disease prevention, cleanliness, and the role of biosecurity in improving poultry productivity. This increased awareness is a critical foundation for the next stages of the TJP2 program, where hygiene and waste management will become integral components of sustainable livestock practices (Menoh et al., 2018).

2. Environmental and Management Improvements

Following the disinfection activity, the poultry houses showed visible improvement in cleanliness and odor reduction. The cleaning and disinfection of cages, feeding tools, and water containers created a more comfortable and healthier environment for the KUB chickens. Farmers also reported that the activity motivated them to establish a regular cleaning schedule, with several members initiating weekly cage sanitation routines. These behavioral changes indicate that the intervention not only provided immediate sanitary benefits but also encouraged the adoption of long-term management practices aligned with biosecurity principles (Manimaran et al., 2025).

3. Challenges and Adaptation

During the implementation, some challenges were encountered, particularly related to the availability and cost of disinfectants. To address this, the facilitation team introduced locally available and affordable disinfectant alternatives that could be safely used in poultry environments. This approach helped the farmers realize that maintaining good hygiene does not always require expensive inputs. Instead, simple, consistent practices can effectively prevent disease and reduce mortality. The use of community-based materials also aligns with the zero-waste principle, promoting environmentally friendly and economically feasible solutions.

4. Relevance to the Zero-Waste Livestock System (TJP2)

The disinfection activity, although seemingly simple, plays an important role in the broader implementation of the **Zero-Waste Livestock System “Tanam Jagung Panen Protein (TJP2)”**. Clean poultry environments help ensure that chicken manure collected after cleaning is free from harmful pathogens, making it safer to process into organic fertilizer. In turn, this fertilizer can be used for corn cultivation within the same farming system, creating a circular and integrated production cycle. The concept illustrates how biosecurity is not only related to animal health but also contributes directly to waste utilization and environmental sustainability.

The participation of the Along Karya Farmer Group in this initiative demonstrates the **community's** growing awareness of sustainable farming practices. By linking biosecurity with waste management and integrated crop-livestock production, the program provides a comprehensive framework for improving both productivity and ecological balance. The active engagement of farmers throughout the process suggests that the activity successfully met its primary objective—to introduce biosecurity practices as a foundation for building a zero-waste livestock model that benefits both people and the environment (Nguru et al., 2024).

5. Social and Economic Implications

Beyond the technical outcomes, this activity also had social and economic implications. The training sessions encouraged collaboration among farmers, strengthening group cohesion and collective responsibility for maintaining hygiene standards. Improved poultry health is expected to reduce disease-related losses and increase production efficiency, which in turn may enhance household income. Furthermore, by promoting environmentally responsible practices, the program contributes to the community's long-term resilience and aligns with the national agenda for sustainable rural development.

Overall, the disinfection activity successfully demonstrated that simple and low-cost biosecurity measures can have a substantial impact on the health and productivity of community-based poultry systems. More importantly, it laid a strong foundation for subsequent stages of the TJP2 program, including waste recycling, organic fertilizer production, and feed resource integration. The

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active involvement and enthusiasm of farmers highlight the importance of participatory approaches in technology transfer and behavioral change. Continuous monitoring and follow-up assistance will be essential to ensure that these positive outcomes are sustained and expanded to other farmer groups in the region.

CONCLUSION

The implementation of poultry house disinfection at the Along Karya Farmer Group successfully introduced and strengthened biosecurity awareness among smallholder KUB chicken farmers. The activity demonstrated that maintaining hygiene through proper cleaning and disinfection practices is a simple yet highly effective step to prevent disease, improve poultry health, and support productivity. Farmers showed active participation and a clear increase in knowledge and understanding of biosecurity concepts after the training and practical sessions.

Beyond its immediate impact on poultry sanitation, the activity also contributed to building the foundation for a broader **Zero-Waste Livestock System (TJP2)**. Clean and healthy poultry environments enable the safe utilization of manure for crop production, particularly in corn cultivation, thus promoting circular resource use and reducing waste. The initiative fostered positive behavioral changes among farmers, encouraging them to adopt regular cleaning routines and integrate sustainable livestock practices into their daily management systems.

This activity highlights the importance of community engagement and participatory education in promoting sustainable livestock development. The success of the disinfection program serves as an entry point for the continuation of the TJP2 initiative, which integrates animal husbandry and crop farming to enhance both environmental and economic outcomes. Future activities will focus on strengthening farmers' technical capacity in waste processing, feed resource management, and organic fertilizer production to fully realize the vision of a zero-waste farming model that benefits both people and the planet.

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