

Transforming Traditional Native Chicken Production into a Semi-Intensive System through the Utilization of Household Food Waste in Lempake Urban Village, Samarinda

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Abstract: Native chickens are an important poultry commodity for smallholder farming systems; however, their production remains constrained by challenges related to housing systems, feed management, and animal health. This community service program aimed to improve the knowledge and skills of members of the Karya Tani Unggas Sejahtera farmer group in Lempake Urban Village, Samarinda City, in implementing a semi-intensive native chicken production system, utilizing household food waste as a potential feed resource, and improving animal health management. The program was conducted on 25 September 2026 using a participatory approach that combined community education, training and hands-on practice, dissemination of appropriate science and technology, consultation, and mentoring. Participants' knowledge was evaluated through pre-tests and post-tests involving 20 participants and covering three aspects: native chicken production, feed and nutrition, and health management. The mean knowledge score increased from 66.33% before the program to 92.33% after the program, representing an increase of 26 percentage points or 39.2% relative to the pre-test score. The scores increased by 29 percentage points for native chicken production, 28 percentage points for feed and nutrition, and 21 percentage points for health management. These findings indicate an improvement in participants' knowledge following the program. However, the evaluation primarily measured changes in knowledge and did not establish long-term improvements in chicken productivity or sustained adoption of the introduced technologies. Continued mentoring and follow-up evaluation are therefore needed to assess changes in husbandry practices and production performance.

1. INTRODUCTION

Native chickens are an important poultry commodity in smallholder farming systems in Indonesia. Native chickens are commonly raised on a household scale because they are relatively easy to manage, can utilize locally available resources, and provide economic value to farming households. Native chickens are also important for household food security and livelihoods in resource-poor communities (Tenza et al., 2024). Nevertheless, the productivity of native chickens in smallholder production systems remains constrained by various factors, particularly those related to husbandry systems, housing management, feed provision, and

animal health. Hidayat and Asmarasari (2015) reported that the development of native chickens in Indonesia faces several constraints, including relatively slow growth, a high risk of mortality, and relatively low egg production. Improvements in breeding, nutrition, and husbandry management are therefore needed to increase the productivity of native chickens.

These conditions were also observed among native chicken farmers in Lempake Urban Village, Samarinda City. Based on preliminary observations and interviews conducted during the initial stage of the program, most members of the Karya Tani Unggas Sejahtera farmer group still applied traditional husbandry practices, particularly free-ranging systems. Chickens were raised around household premises with limited housing management, while feed generally consisted of locally available materials, such as rice bran, corn, and leftover rice, without regular formulation or measurement. Preliminary information collected during program preparation indicated that flock sizes were approximately 10–20 chickens per household. The initial assessment also identified several challenges related to housing management, feed provision, animal health practices, and record keeping. These conditions highlighted the need for practical training and assistance to improve native chicken husbandry practices at the household level.

Traditional husbandry systems without adequate housing management may limit farmers' control over their chickens, particularly with regard to feed provision, environmental cleanliness, separation of chickens according to age, and disease control. A transition toward a semi-intensive system is one alternative that can be applied to smallholder native chicken production because it allows chickens to continue utilizing local resources while providing better control over housing, feed, health, and the surrounding environment. Studies on native chicken production in Indonesia indicate that a shift from traditional systems toward semi-intensive and intensive systems can improve productivity through better husbandry management.

In addition to husbandry management, feed is an important factor determining the success of native chicken production. High feed costs and limited farmer capacity to formulate rations often result in the use of feed ingredients available around the household without considering nutrient balance. Nutrient balance is important because nutrient requirements are related not only to growth but also to the development of body tissues in chickens. Research on native chickens during the finisher phase showed that dietary protein and lysine levels affected femoral bone calcium mass and femur length, indicating that adequate and balanced nutrient supply is an important component in supporting chicken development (Rizkuna et al., 2024).

Household food waste may offer an alternative feed resource for poultry, provided that its nutritional quality and safety are properly managed. Previous research has identified food waste as a potential poultry feed ingredient, although its nutrient composition may vary considerably and it may contain biological or chemical contaminants (Truong et al., 2019). Research involving laying hens has also reported that diets containing recycled food waste can maintain egg production and, under certain conditions, improve feed-use efficiency (Dao et al., 2023). However, these findings do not imply that all types of household food waste are suitable for direct feeding to native chickens. Before being incorporated into poultry diets, food waste should be carefully sorted to remove non-feed materials and exclude spoiled, moldy, or otherwise unsuitable ingredients. Appropriate processing, handling, and storage are necessary to minimize contamination risks, while the nutritional composition and potential hazards of the selected materials should be considered during ration formulation. These precautions are essential to ensure that the use of household food waste supports feed resource efficiency without compromising poultry health and feed safety.

Another challenge faced by farmers is limited knowledge of native chicken health management. Farmers need basic skills to select healthy chicks or birds, recognize signs of health problems, maintain housing sanitation, implement simple biosecurity measures, and take appropriate initial action when sick or injured chickens are identified. Improving farmers' capacity in animal health and biosecurity is important because disease is one of the factors that can cause economic losses in small-scale poultry production. Studies among small-scale poultry farmers have shown that access to information and the adoption of biosecurity practices are important components of disease risk management (Otieno et al., 2023). Studies among small-scale poultry farmers have shown that improvements in knowledge and the implementation of biosecurity practices are important components of disease risk management.

Integrated training activities combining theoretical instruction and practical sessions have been reported to improve the knowledge and skills of small-scale poultry farmers. Yusuf and Popoola (2022), for example, showed that training for small-scale poultry farmers covering housing, production systems, feed, health, biosecurity, and record keeping improved management practices after training. These findings indicate that strengthening farmer capacity through training tailored to local problems is a relevant approach to improving the management of native chickens.

Based on these conditions, a Community Partnership Program (Program Kemitraan Masyarakat, PKM) was implemented to improve the knowledge and skills of a native chicken farmer group in Lempake Urban Village, Samarinda, through extension activities, hands-on

practice, and mentoring. The program focused on three main aspects: native chicken production and the implementation of a semi-intensive housing system; nutrition and feed formulation through the utilization of household food waste; and native chicken health management. The health component included not only the selection of healthy chicks and birds and routine husbandry practices but also consultation on field cases, including the initial management of injured chickens and the identification of health problems associated with infectious diseases.

The program was conducted over a two-week period through a series of socialization and extension activities, technology application practices, consultation and mentoring, and evaluation. The effectiveness of the program in improving participants' knowledge was evaluated using pre-tests and post-tests covering three subject areas: native chicken production, native chicken feed and nutrition, and native chicken health management. The evaluation results were used to describe changes in participants' knowledge levels after they had completed the series of community service activities.

2. METHODS

Implementation Materials

The materials provided during the community service program were developed based on the problems faced by the target farmer group in raising native chickens under traditional husbandry systems. The materials covered three main aspects: native chicken production and the implementation of a semi-intensive housing system; native chicken feed and nutrition, including the utilization of household food waste; and native chicken health management. The production materials covered the introduction of semi-intensive husbandry systems, housing management, housing sanitation, and basic native chicken husbandry practices. The feed and nutrition materials covered the feed requirements of native chickens, identification of feed ingredients, simple feed formulation, and the utilization of household food waste as one of the feed resources after appropriate handling and processing. The health management materials covered the selection of healthy chickens or chicks, health maintenance, sanitation, disease prevention, and initial management of health problems identified among the farmers' chickens.

Implementation Methods

The community service program was conducted in 25 September 2026 in Lempake Urban Village, Samarinda City, East Kalimantan, involving 20 participants from the Karya Tani Unggas Sejahtera farmer group. Participants were selected from group members who were involved in native chicken farming and attended the program activities. The program was implemented over a two-week period using a participatory approach that combined community

education, training, dissemination of science and technology, and advocacy through mentoring. These activities were designed to improve participants' knowledge and skills in native chicken husbandry, feed and nutrition management, and animal health.

Participants' knowledge was evaluated using pre-tests and post-tests consisting of 30 multiple choice questions with four answer options (A, B, C, and D). The questions covered three subject areas: native chicken husbandry, feed and nutrition management, and animal health management. Each correct answer was assigned a score of 1, whereas an incorrect answer was assigned a score of 0. The total score for each participant was calculated by summing the correct answers and dividing the result by the total number of questions (30), then multiplying by 100 to obtain a percentage score. The mean pre-test and post-test scores were calculated across the 20 participants to assess changes in knowledge following the program. The percentage point change was calculated by subtracting the mean pre-test score from the mean post test score, while the relative percentage increase was calculated by dividing this difference by the mean pre-test score and multiplying by 100.

The Community Education method was implemented through socialization and extension activities for participants on more structured native chicken management. The extension activities involved presentations, discussions, and question-and-answer sessions. The materials focused on three main problems faced by the farmers: native chicken production and semi-intensive housing, feed and nutrition and the utilization of household food waste, and native chicken health management. Through this method, participants were provided with an understanding of the importance of transitioning from traditional husbandry practices toward a more controlled production system.

The training method involved demonstrations and hands-on practice in semi-intensive native chicken production, feed formulation, and the utilization of household food waste as a potential feed ingredient. For the feed preparation practice, household food waste consisting of leftover rice, vegetables, and other food scraps was sorted to remove non-food materials and unsuitable ingredients, such as spoiled or moldy food. The selected food waste was then mixed with rice bran at a 1:1 ratio by weight. A solution containing 10 mL of EM4 (equivalent to one bottle cap) and one tablespoon of molasses per liter of water was prepared and gradually added to the mixture while stirring thoroughly. The solution was added gradually until the mixture reached a suitably moist consistency. The mixture was then transferred into an airtight drum or suitable container and compacted to minimize trapped air before the container was tightly sealed to establish anaerobic conditions. The mixture was fermented for seven days. Proper hygiene during preparation and handling, careful selection of ingredients, and inspection for

signs of spoilage before considering the fermented material for use as a feed ingredient were emphasized. Fermentation was not considered a substitute for appropriate ingredient selection and feed safety management.

The Science and Technology Dissemination method was implemented through the introduction and application of simple knowledge and technologies that could be adopted by farmers according to their production conditions. The technologies introduced included the implementation of a semi-intensive housing system, feed management using materials available in the local environment, and the management of household food waste that could be utilized as a feed ingredient after appropriate processing. This approach was intended to ensure that the technologies introduced were simple, practical, and compatible with the capacity and conditions of the target farmer group.

The Advocacy and Mentoring method was conducted following the extension and practical activities. Mentoring focused on the application of the training outcomes, particularly in native chicken production and feed preparation. Participants were given opportunities to report problems encountered during chicken rearing and received guidance based on conditions observed in the field. Mentoring was also used to strengthen participants' ability to independently implement the husbandry system introduced during the program.

Program evaluation was conducted to assess changes in participants' understanding after completing the series of activities. Evaluation was performed using pre-tests and post-tests administered before and after the learning activities. The assessment covered three aspects: native chicken production, native chicken feed and nutrition, and native chicken health management. The evaluation results were analyzed descriptively by comparing scores before and after the program. The increase in scores was used as an indicator of changes in participants' knowledge after receiving the extension and training. In addition to the written assessment, the implementation process was observed through discussions, practical activities, consultations, and mentoring to assess participants' involvement in understanding and applying the materials provided.

Overall, the implementation stages consisted of socialization and extension, training and hands-on practice, consultation and mentoring, and evaluation. These stages were arranged sequentially so that the process of strengthening farmer capacity progressed from knowledge acquisition and skill development to mentoring in the application of the training outcomes under field conditions.

3. RESULTS AND DISCUSSION

Implementation and Program Outputs

The community service program was conducted over a two-week period in Lempake Urban Village, Samarinda City, East Kalimantan, in collaboration with the Karya Tani Unggas Sejahtera farmer group. The program aimed to strengthen farmers' capacity in native chicken management through an integrated approach combining extension activities, training, hands-on practice, consultation, and mentoring. The materials covered three main aspects: native chicken production using a semi-intensive system, feed management and the utilization of household food waste, and native chicken health management. This approach was adapted to the initial conditions of the partner group, whose members largely practiced traditional husbandry systems and required improvements in housing, feed, and animal health management.

The husbandry system is an important factor in the development of native chicken production because traditional, semi-intensive, and intensive systems differ in their levels of management and control over the birds. The development of a more controlled husbandry system can serve as a strategy for improving native chicken production management among smallholder farmers (Hidayat & Asmarasari, 2015). In rural communities, semi-intensive systems can also serve as a form of native chicken production that can be adapted to farmers' available resources and local conditions (Wantasen et al., 2014). Therefore, the implementation of a semi-intensive system in this program was not intended to drastically change the farmers' existing production practices but rather to serve as a transitional stage from free-ranging practices toward a more controlled husbandry system.



Figure 1. Delivery of training materials to the farmers

The training sessions were conducted interactively by connecting the concepts presented with the actual conditions encountered by the farmers. Regarding production management, participants were introduced to the concept of semi-intensive husbandry, housing management, environmental cleanliness, grouping chickens according to production stage, and monitoring bird conditions. This approach was relevant to the conditions of the partner group because, before the program, some farmers still raised chickens under free-ranging conditions, resulting in limited control over housing location, feed provision, cleanliness, and health management. Literature on native chicken husbandry systems in local communities indicates that production practices are strongly influenced by farmers' habits and the resources available to them; therefore, management improvements need to be adapted to local conditions (Hartini et al., 2022).

One of the visible outputs of the program was the introduction of a semi-intensive husbandry system as an alternative to traditional free-ranging practices. As illustrated in Figure X, before the intervention, chickens were still allowed to roam freely around the household environment. Following the program, chickens began to be kept in a designated semi-intensive housing area, allowing for more structured flock management and greater control over feeding, housing sanitation, and routine health monitoring. The before-and-after photographs document a change in the chickens' housing and management practices. However, improvements in productivity were not evaluated as part of this program.

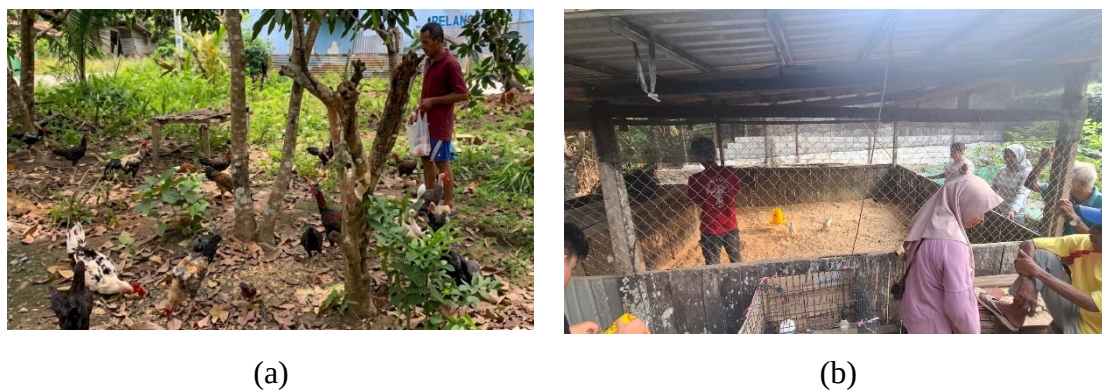


Figure 2. (a) Native chickens roaming freely before the program; (b) native chickens kept in a semi-intensive housing area after the program.

The observed changes indicate that the materials provided were not merely theoretical but were directed toward simple applications that could be implemented by farmers. Nevertheless, the observed changes in production conditions after the program cannot be used to conclude that long-term improvements in animal productivity had occurred. Productivity indicators such as body weight gain, mortality, egg production, and feed efficiency require a longer observation period. Therefore, the primary outputs at this stage are more appropriately considered improvements in farmer capacity and the introduction of production technologies that can be further implemented by the farmer group.

Regarding feed management, participants were provided with an understanding of feed ingredient selection, simple feed formulation, and the utilization of suitable organic household materials. The utilization of local resources and materials available around farmers' households can form part of a strategy for developing native chicken production in rural areas. However, the use of waste or leftover food as feed ingredients must be selective because nutrient composition may vary and there is a potential risk of biological or chemical contamination if the materials are not handled properly (Simmons et al., 2023). Therefore, the program emphasized not only the utilization of household food waste but also the importance of material sorting, processing, and the selection of materials suitable for livestock.

Feed processing through fermentation was also introduced as one approach to utilizing locally available materials. The literature indicates that fermentation can alter the characteristics of feed materials and potentially improve their suitability for use in poultry diets, although its effectiveness depends on the type of material, microorganisms involved, processing methods, and diet composition (Katu et al., 2025). Research on local chickens has also indicated that fermented feed can be investigated as an approach to supporting

performance and health status in chickens raised under resource-limited production systems (Khonyoung et al., 2025). Therefore, the training activities in this program were designed to help farmers understand the principles of utilizing local materials rather than simply using all household waste directly as poultry feed.



Figure 3. Practice in sorting and utilizing feed materials and household food waste to support native chicken production.

Regarding health management, participants received training on the selection of healthy chickens, health maintenance, housing cleanliness, sanitation, disease prevention, and initial management of health problems identified in the field. The activities were also complemented by consultations concerning sick chickens, wound management, and discussions of disease problems previously encountered by the farmers. This problem-based approach helped connect the training materials with farmers' experiences, making the information easier to relate to their daily practices.

Health management is an important component of native chicken production because the implementation of biosecurity and animal health practices is influenced by farmers' level of knowledge and access to information. Research among small-scale poultry farmers has shown that access to information is an important factor associated with the implementation of biosecurity practices (Otieno et al., 2023). Therefore, the health information provided in this program was not limited to the management of sick chickens but also emphasized preventive measures through sanitation, housing management, observation of bird condition, and improved husbandry practices.

Overall, the program produced a mentoring model that integrated knowledge delivery with hands-on practice and consultations based on field conditions. This approach is important because increased knowledge does not necessarily result directly in long-term changes in husbandry behavior. Research on poultry farmer training has shown that training interventions can improve knowledge in several aspects of production and biosecurity; however, a single

training intervention may not be sufficient to produce sustainable behavioral changes, and continued communication and mentoring are therefore required (Islam et al., 2026).

Knowledge Improvement of Participants

Knowledge evaluation was conducted through a pre-test administered before the learning activities and a post-test administered after completion of the extension and training activities. The assessment covered three aspects: native chicken production, feed and nutrition management, and animal health management. Both assessments used the same set of 30 multiple-choice questions covering these three subject areas. The scores presented in Table 1 represent the mean percentage scores of the 20 participants who completed both tests. Knowledge improvement was expressed as the difference between post-test and pre-test scores in percentage points, while the relative increase was calculated by dividing the score difference by the pre-test score and multiplying by 100. The evaluation results are presented in Table 1.

Table 1. Evaluation of participants' knowledge before and after the program.

Assessment aspect	Pre-test (%)	Post-test (%)	Increase (percentage points)	Relative increase (%)
Native chicken production	57	86	29	50.90
Native chicken feed and nutrition	65	93	28	43.10
Native chicken health management	77	98	21	27.30
Mean	66.33	92.33	26.00	39.20

Note: Values represent mean percentage scores for the 20 participants.

Based on Table 1, the mean knowledge score of the participants increased from 66.33% in the pre-test to 92.33% in the post-test. Thus, the participants' knowledge increased by 26 percentage points, representing a relative increase of 39.2%. These results indicate an improvement in participants' mastery of the materials after they completed the series of extension and training activities. This finding is consistent with Islam et al. (2026), who reported that training for poultry farmers can improve knowledge of production and biosecurity aspects covered in the training. However, an increase in knowledge scores should be distinguished from changes in behavior or successful technology adoption because both indicators require observation over a longer period..

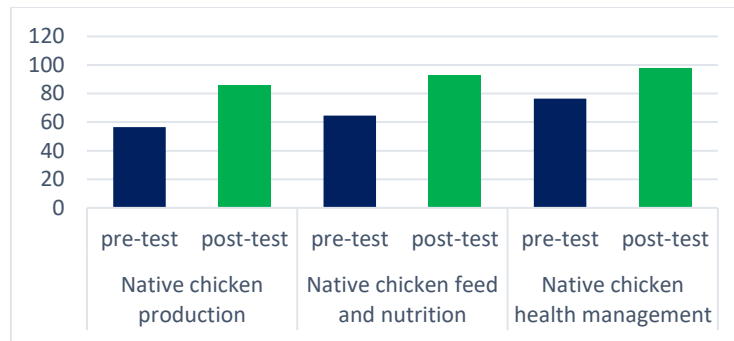


Figure 4. Comparison of participants' pre-test and post-test scores by subject area.

For native chicken production, the participants' score increased from 57% to 86%, representing an increase of 29 percentage points or a relative increase of 50.9%. This was the highest relative increase among the three assessed aspects. This finding indicates that the production management materials, particularly those concerning the semi-intensive system and housing management, provided substantial additional understanding to the participants. This result may be attributed to the direct relevance of the materials to the changes in the production system introduced during the program.

The semi-intensive system is relevant to household-scale native chicken production because it can serve as an intermediate management system between traditional free-ranging practices and more intensive production systems. Hidayat and Asmarasari (2015) explained that the development of native chicken production systems from traditional practices toward more controlled systems is associated with efforts to improve productivity through better management. Therefore, the increase in knowledge related to production management in this program can serve as an initial basis for farmers to improve their husbandry practices.

Nevertheless, an increase in post-test scores does not automatically indicate that all participants have consistently implemented all components of the semi-intensive system. Changes in husbandry habits require time, particularly among farmers who have practiced free-ranging systems for a long period. Therefore, continued mentoring is necessary to ensure that the knowledge gained can be consistently applied in daily chicken production.

Regarding native chicken feed and nutrition, the pre-test score of 65% increased to 93%, representing an increase of 28 percentage points and a relative increase of 43.1%. This increase indicates that participants gained a better understanding of feed ingredients, the utilization of local materials, and the principles of feed management presented during the program. Improved understanding is important because household-scale native chicken production commonly relies on feed materials available around the farmers' homes, resulting

in differences in the quality and quantity of materials used among farmers.

The utilization of household food waste has the potential to support more efficient resource utilization, but its use as feed requires careful consideration of material quality and safety. Simmons et al. (2023) reported that food materials that have become leftovers or waste can be utilized in poultry feed, but challenges include variations in nutrient composition, the possible presence of unsuitable materials, and biological and chemical risks. Therefore, the improvement in participants' knowledge in this program was not limited to the ability to utilize food waste but also included the ability to select suitable materials and understand the importance of appropriate processing before the materials are provided to livestock.

The use of fermentation as one form of feed-material processing also has a scientific basis. Katu et al. (2025) explained that feed fermentation is an approach that has been investigated in poultry and can influence feed quality and gastrointestinal conditions, although its effects depend on the characteristics of the materials and the fermentation process. In local chickens raised under free-range systems, fermented feed has also been reported as an approach that may support chicken performance and immune responses (Khonyoung et al., 2025). Therefore, fermentation training in this program was positioned as a simple technology that needs to be implemented using appropriate procedures rather than as an automatic guarantee of improved animal performance.

Regarding health management, the pre-test score of 77% increased to 98%, representing an increase of 21 percentage points and a relative increase of 27.3%. Although the relative increase was the lowest among the three aspects, the post-test score for health management was the highest. This indicates that participants already had relatively better initial knowledge of chicken health compared with the other two aspects. Consequently, there was less room for improvement than in aspects with lower initial scores.

The health management materials covered the identification of healthy chickens, sanitation, disease prevention, observation of chicken condition, and initial management of common health problems encountered by farmers. The discussions were also linked to actual problems reported by participants during the consultation sessions. This approach was important because the implementation of health and biosecurity practices in smallholder poultry production is influenced not only by the availability of facilities but also by farmers' knowledge and access to information. Otieno et al. (2023) showed that access to information is an important factor associated with the adoption of biosecurity practices among small-scale poultry farmers.



Figure 5. Implementation of the participant knowledge evaluation through pre-test and post-test.

Overall, the evaluation results showed that the program improved participants' knowledge across all three subject areas. The mean score increased from 66.33% to 92.33%. These results indicate that the extension approach, followed by hands-on practice, discussion, consultation, and mentoring, had a positive effect on participants' knowledge outcomes. However, these evaluation results should be interpreted as an indicator of changes in knowledge rather than direct evidence of increased productivity or changes in farmers' behavior.

Assessment of behavioral changes and successful technology adoption requires further observation after completion of the program. This is important because training can improve knowledge within a relatively short period, whereas changes in husbandry habits, implementation of biosecurity measures, use of alternative feed resources, and consistent housing management require a longer process. Islam et al. (2026) also indicated that a single training intervention may not always be sufficient to produce changes in farmers' behavior; therefore, continued communication and mentoring remain necessary.

Strengths and Limitations of the Program Outputs

The main strength of the program was its integrated approach, combining extension activities with hands-on practice and consultations based on the problems encountered by the farmers. This approach allowed participants not only to receive information theoretically but also to observe examples of its application in the context of household-scale native chicken production. Such an approach is consistent with the characteristics of smallholder farming systems, which vary in terms of production scale, experience, available resources, and husbandry practices (Hartini et al., 2022).

The implementation of a semi-intensive system was another strength because the technology introduced was relatively simple and could be adapted to farmers' conditions. The

system can serve as a transitional stage from free-ranging husbandry toward a more controlled production system without requiring farmers to change their entire production system simultaneously. The development of more controlled husbandry systems is one approach that can be used to improve native chicken production management at the smallholder level (Hidayat & Asmarasari, 2015; Wantasen et al., 2014).

The utilization of household food waste as a feed resource also provided an advantage in terms of utilizing locally available resources. However, feed safety is an important limitation that must be considered. Not all household food waste can be directly provided to chickens. Variations in material composition and nutrient content, the presence of foreign materials, and the possibility of contamination make sorting and processing essential components of its utilization (Simmons et al., 2023). Therefore, the success of food-waste utilization technology depends not only on the availability of materials but also on farmers' ability to select, process, and store the materials appropriately.

Another limitation of the program was its relatively short implementation period of two weeks. This duration was sufficient to conduct extension activities, training, hands-on practice, consultation, and knowledge evaluation, but it was not sufficient to quantitatively assess the long-term sustainability of technology adoption. Therefore, indicators such as changes in mortality, body weight gain, egg production, feed intake, feed efficiency, and production costs cannot be considered quantitative outputs of this program without further observation. Follow up monitoring is recommended over the subsequent three to six months through periodic visits and simple farm records. Monitoring should document the continued use of semi-intensive housing, including housing conditions and sanitation practices; the preparation, storage, and physical quality of fermented household food waste used as a feed ingredient; and basic production indicators, including flock size, mortality, body weight, egg production where applicable, feed use, and feed-related costs. These observations would help assess the extent to which the practices introduced during the program are adopted and maintained, while providing preliminary information on production outcomes and feed management without attributing changes directly to the intervention.

Implementation Challenges and Sustainability Potential

The level of difficulty in implementing the materials varied among the different aspects. Production management materials were relatively easy for participants to understand because they were directly related to daily husbandry activities already practiced by the farmers. The main challenge was changing habits from free-ranging practices toward a more controlled production system, which requires consistency in housing management, sanitation,

feed provision, and flock monitoring.

The feed management and household food waste utilization materials were more challenging because the availability and characteristics of feed materials varied among farmers. The use of food leftovers requires careful selection and processing to ensure that the materials remain safe and suitable for livestock. The implementation of feed technology also needs to be adapted to the availability of materials and the nutritional requirements of the chickens because a single feed formulation may not be suitable for all farmers. Variations in nutrient composition and material safety must therefore be considered when utilizing food waste as feed (Simmons et al., 2023).

Health management materials also require continued mentoring because the health conditions of chickens and the problems encountered may differ among farmers. The materials focused on identifying healthy chickens, sanitation, disease prevention, monitoring bird condition, and initial management based on problems identified in the field. The activities were not intended to replace veterinary diagnosis or laboratory examination.

The sustainability potential of the program is relatively promising because the technologies introduced are simple and utilize locally available resources. The semi-intensive system can be developed gradually, while household food waste utilization can be continued by emphasizing material sorting, processing, feed safety, and nutrient balance. Sustainability should be supported by simple record keeping covering chicken population, mortality, feed use, egg production, and production costs. Overall, the program increased the participants' mean knowledge score from 66.33% to 92.33%, representing an increase of 26 percentage points or 39.2%. Nevertheless, continued mentoring and monitoring are required to ensure that the improvement in knowledge is translated into changes in husbandry practices and sustainable technology adoption.

4. CONCLUSION

The community service program in Lempake Urban Village, Samarinda City, addressed the needs of the Karya Tani Unggas Sejahtera farmer group through education, training, hands-on practice, and mentoring in semi-intensive native chicken production, feed and nutrition management, and animal health. Participants' mean knowledge scores increased from 66.33% before the program to 92.33% afterward, indicating improved knowledge of the topics covered. The program also introduced more structured approaches to chicken housing and the utilization of household food waste as a potential feed ingredient. However, the program did not evaluate the effects of these activities on mortality, egg production, or feed

efficiency. Longer-term monitoring is therefore needed to assess the sustained adoption of the practices introduced and determine their implications for production performance and farm-level economic outcomes.

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