
ASSISTING POULTRY FARMING MSMEs IN FORMULATING HALAL AND AFFORDABLE FEED TO INCREASE PRODUCTIVITY

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ABSTRACT

This community service program aims to strengthen the capacity of poultry-farming MSMEs in formulating halal, affordable, and nutritionally balanced feed to improve livestock productivity. The assistance was carried out to address common challenges faced by small-scale farmers, including limited knowledge of halal feed standards, dependence on commercial feed with fluctuating prices, and the lack of skills in utilizing locally available raw materials. The program employed a participatory empowerment approach consisting of three main stages: (1) awareness and training, which introduced halal feed principles, identification of permissible ingredients, and cost-efficient formulation techniques; (2) technical workshops and hands-on practice, where participants collaboratively formulated and produced halal feed using locally sourced materials; and (3) monitoring and mentoring, which involved periodic supervision, evaluation of feed quality, and assessment of changes in farm productivity. The results of the program indicate a positive impact on the targeted MSMEs. Participants demonstrated an increased understanding of halal feed requirements and the ability to independently formulate balanced rations at lower cost. The application of the newly formulated feed contributed to improved growth rate, feed efficiency, and overall poultry performance. In addition, farmers reported reduced dependence on commercial feed and enhanced confidence in maintaining halal compliance. This program highlights the significance of capacity building and locally based feed innovation as strategic efforts to improve productivity and competitiveness among poultry-farming MSMEs.

Keywords: Poultry Farming, MSMEs, Halal Feed

INTRODUCTION

Poultry farming remains one of the most important sources of livelihood within the MSME sector, especially in rural and peri-urban areas, contributing significantly to local food security and income generation. However, many small-scale poultry-farming MSMEs still struggle with high production costs, of which feed often accounts for about 60–70% of total costs. This cost burden reduces profitability and creates economic vulnerability when the market price of commercial feed fluctuates. (Azizah et al., 2023)

In addition, halal compliance has become a critical concern both for producers and consumers. For farmers targeting Muslim consumers, it is no longer sufficient to raise poultry — they must ensure that feed ingredients and production processes meet halal standards to maintain market trust and meet regulatory or market-driven halal demands. Yet many small-scale farmers lack sufficient knowledge of halal feed standards and

correct ingredient selection. As shown in community service work that supports halal certification efforts for MSMEs, limited access to information and complex certification processes remain major constraints for small businesses. (Khoiri & Fitriyanto, 2024)

Moreover, there is often limited awareness and technical capacity to formulate nutritionally balanced and cost-effective feed rations using locally available raw materials (e.g. agricultural by-products, local grains, alternative protein sources). Without this capacity, farmers continue to rely on commercial feed, missing the chance to reduce costs and become more self-sufficient. This challenge has been documented in empowerment programs aimed at enabling farmers to produce feed from local resources. (Rusdianto et al., 2023)

Beyond raw ingredient access, many MSMEs also lack knowledge about poultry nutrition, feed formulation techniques, appropriate ration balancing for different life stages of birds, and feed management practices — all of which are essential to ensure optimal growth, feed efficiency, and animal health. This deficit undermines livestock performance and limits productivity gains. (Supriyanto et al., 2021)

Socio-economic constraints further exacerbate the problem. Many small farmers have limited access to training, extension services, or mentoring; they may lack exposure to updated practices or networks that can support innovation and feed independence. The reliance on external feed suppliers and lack of local feed-formulation know-how constrain their operational autonomy and resilience. (Azizah et al., 2023)

In addition to economic and technical issues, fluctuating commercial feed prices create uncertainty and financial instability for small poultry enterprises. When prices rise, farmers may reduce feed quality or quantity, shift to improvised feeding practices, or even scale down production — decisions that can negatively affect growth, mortality, and overall farm viability. This highlights the need for alternative, more stable and affordable feed solutions. (Rusdianto et al., 2023)

Given these challenges, community-based interventions to build capacity and empower small-scale poultry farmers are highly relevant. Such interventions can enable farmers to formulate their own feed using local raw materials, reduce dependence on commercial feeds, lower operational costs, and improve business sustainability. A participatory, hands-on training approach has been shown effective in increasing farmer knowledge and raising feed-management competence. (Azizah et al., 2023)

In particular, alternative feed innovations — for example the use of insect-based protein sources such as black soldier fly (BSF) maggot, aquatic plants like Azolla, or agricultural by-products — have demonstrated potential to meet nutritional needs of poultry at lower cost and using local resources. These innovations contribute not only to cost reduction but also to environmental sustainability and resilience of rural economies. (Rusdianto et al., 2023)

From the market and industry perspective, there is also promise in developing a local feed industry: feasibility studies show that establishing poultry-feed manufacturing based on local raw materials is economically and technically viable in some regions, which could reduce dependence on imported or industrial feed and support local feed sovereignty. (Nurhasanah et al., 2022)

Beyond productivity and cost benefits, ensuring halal compliance in feed formulation and manufacture supports the integrity of the halal value chain, increases consumer confidence, and enhances the competitiveness of MSME poultry products in halal-oriented markets. By equipping farmers with knowledge about halal standards and feed safety, empowerment programs contribute to long-term sustainability, market access, and community welfare. (Anto et al., 2025)

METHOD

The community service program adopted a participatory empowerment approach that prioritized active involvement of poultry-farming MSMEs in all stages of the activity. This approach was selected because previous empowerment-based programs have demonstrated effectiveness in improving farmers' technical skills and long-term independence in livestock management. The combination of education, hands-on practice, and mentoring allowed the program to address both knowledge gaps and practical challenges in the field. (Azizah et al., 2023)

The first stage focused on awareness building and introductory training sessions designed to strengthen foundational understanding of halal feed principles. Farmers were introduced to permissible and prohibited ingredients, traceability requirements, and the importance of compliance with halal assurance systems. This approach aligns with previous community-based halal literacy programs, which found that structured education significantly improves MSME readiness for halal compliance and product assurance. (Khoiri & Fitriyanto, 2024)

The second stage consisted of practical, hands-on workshops emphasizing feed formulation techniques using local raw materials. Participants learned how to assess nutrient needs, calculate balanced rations, and identify appropriate combinations of ingredients that were halal, affordable, and locally available. Hands-on feed production activities enabled farmers to compare their formulations with commercial feed, mirroring successful capacity-building models previously implemented in rural livestock communities. (Rusdianto et al., 2023)

The third stage involved monitoring and mentoring through on-site visits to participants' farms. During these visits, the project team evaluated feed quality, observed poultry performance indicators, and identified adjustments needed to improve outcomes. Continuous mentoring has been recognized as a critical factor in sustaining behavioral change and ensuring the adoption of new practices among livestock farmers. (Supriyanto et al., 2021)

The evaluation phase included collecting both qualitative and quantitative data to measure program effectiveness. Tools such as surveys, observation checklists, interviews, and production records were used to assess improvements in feed knowledge, cost efficiency, and poultry productivity. The evaluation framework followed feasibility study models commonly applied in community-based agricultural interventions to ensure valid and useful findings for future replication efforts. (Nurhasanah et al., 2022)

RESULTS

The implementation of the community service program produced substantial improvements in the knowledge and awareness of poultry-farming MSMEs regarding halal feed formulation. Initially, most participants showed limited familiarity with halal standards, particularly concerning critical control points in ingredient selection. After attending the structured workshops, they demonstrated a clearer understanding of the distinction between permissible and non-permissible ingredients in poultry feed production. Participants also gained deeper insights into the importance of halal compliance throughout the entire feed production chain. They learned that halal assurance is not solely about ingredient selection but also includes handling, storage, and processing practices. This expanded understanding helped MSMEs realize the broader implications of adopting halal principles in developing feed products for their poultry businesses.

In terms of technical capacity, the program successfully strengthened participants'

skills in formulating nutritionally balanced feed. Through a series of hands-on activities, the MSMEs practiced combining multiple feed ingredients and calculating nutrient ratios that match the dietary needs of broilers and layers. This practical engagement helped build their confidence and reduced their previous reliance on commercial feed. Another important improvement was the participants' growing ability to evaluate the nutritional composition of potential feed ingredients. They learned to identify carbohydrate-rich components, protein sources, fiber content, and essential micronutrients. This ability enabled them to select ingredients based on nutritional value rather than solely on price or availability.

During the practical feed-mixing sessions, participants developed three main feed formulas tailored to different poultry types and growth stages. These formulas were constructed using locally sourced materials such as corn, rice bran, cassava waste, fishmeal, and herbal additives. The development of these formulas marked a significant step toward MSMEs' autonomy in managing their feed supplies. One of the most notable outcomes of the program was the reduction in feed production costs among participating MSMEs. By utilizing affordable local ingredients, several participants reported cost reductions ranging from 12% to 18%. This financial improvement increased their profit margins and made their businesses more resilient to fluctuating feed prices in the commercial market.

Field application of the newly developed formulas showed encouraging results. Over the four-week trial, broiler farmers observed noticeable increases in the average weight of their poultry. These improvements were measured through periodic weighing sessions that showed steady growth patterns and healthier physical conditions among the birds. Egg-laying MSMEs also reported positive outcomes after adopting the formulated feed. Hen-day production increased by approximately 5%, which indicated better nutritional intake and more consistent laying cycles. Farmers noted that their poultry appeared more active and exhibited fewer signs of nutritional deficiency.

The feed conversion ratio (FCR) data collected during the field trials further supported the effectiveness of the formulated feed. Several farmers reported reductions in FCR, indicating that their poultry required less feed to achieve satisfactory growth and productivity. This efficiency is particularly important for small-scale farmers seeking to optimize costs without compromising performance.

The program also improved participants' ability to manage feed storage practices. Many MSMEs previously stored feed ingredients without considering humidity levels, contamination risks, or halal-related concerns. After the training, participants implemented improved storage methods such as sealing containers properly, elevating storage units, and separating halal and non-halal materials. In addition to improved performance indicators, farmers observed better overall poultry health. Birds maintained more stable energy levels, had shinier feathers, and experienced fewer digestive issues. These observations suggested that the formulated feed not only supported growth but also contributed to general wellness.



Picture 1. Feed For Poultry-Farming

Several locally sourced agricultural by-products were identified by the MSME participants as potential components for developing affordable and halal poultry feed. These ingredients include tofu residue (ampas tahu), bean sprout skins (kulit toge), coconut pulp (ampas kelapa), banana peels (kulit pisang), taro corm residue (talas bonggol), and rice bran (dedak). Each ingredient contributes distinct nutritional benefits and supports the goal of reducing feed costs while maintaining balanced nutrition. Tofu residue serves as a valuable protein source due to its soybean origin. It contains digestible plant-based protein that supports muscle development in poultry, making it a suitable partial substitute for commercial soybean meal. When processed and dried properly, tofu residue maintains its nutritional integrity and is safe for inclusion in poultry feed.

Bean sprout skins contain moderate levels of fiber and micronutrients. Although low in protein, they contribute to digestive health and can be used as a complementary ingredient to improve feed bulk. Their availability from local vegetable markets makes them inexpensive and easy to obtain. Coconut pulp, a by-product of coconut milk extraction, offers both energy and fiber content. It contains residual fats that serve as an energy source for poultry, especially during growth stages. Because of its high moisture content, proper drying is necessary to prevent spoilage before mixing it into feed formulas.

Banana peels provide carbohydrates, vitamins, and minerals such as potassium. When chopped, fermented, or dried, banana peels become more digestible and can help diversify the feed's nutrient composition. Their abundance and cost-free availability make them an attractive option for MSMEs seeking low-cost ingredients. Taro corm residue, derived from the base portion of the taro plant, contains energy-rich starch and can be processed through boiling, drying, or fermentation to enhance digestibility. Its incorporation into feed formulas supports energy requirements for both broilers and layers while reducing dependency on commercial carbohydrate sources.

Rice bran remains one of the most widely used and nutritionally balanced ingredients in local poultry feed formulations. It provides energy, moderate protein content, and essential fatty acids. Additionally, rice bran enhances feed palatability and contributes to overall feed quality. As an affordable and halal-certified agricultural by-product, it serves

as a cornerstone in many MSME-produced feed formulas. Together, these ingredients illustrate the potential of local resources to support the development of halal, affordable, and nutritionally adequate feed for poultry-farming MSMEs. Their integration into feed formulations aligns with the program's objective of promoting sustainable and cost-efficient feeding practices.

Another positive change was the adoption of better ingredient selection practices. MSMEs began purchasing ingredients from suppliers who could provide clearer traceability and halal assurance. This shift enhanced the reliability of their feed products and strengthened consumer confidence in their poultry operations. The mentoring sessions also led to improved documentation habits among MSMEs. Participants began to systematically record ingredient types, proportions, batch numbers, and production dates. This documentation practice helped them evaluate feed performance over time and identify areas for further improvement.

During the mentoring phase, participants learned to troubleshoot issues in feed formulation. For instance, they discovered how to adjust formulas when poultry showed signs of excessive fat, low energy, or reduced egg-laying frequency. This problem-solving skill gave them greater control over their production outcomes. The collaborative learning environment fostered strong peer-to-peer support among MSMEs. Farmers shared their experiences, exchanged ingredient recommendations, and discussed pricing trends. This interaction strengthened community bonds and encouraged continuous learning beyond the program period. Local suppliers also benefited from the growing engagement of MSMEs in feed formulation. Suppliers reported increased demand for certain ingredients and began offering better-quality raw materials. This mutually beneficial relationship improved the overall supply chain supporting poultry farming in the region.

An additional outcome of the program was increased interest among MSMEs in pursuing halal certification. As their understanding of halal assurance improved, several participants began exploring the documentation and procedural requirements for formal certification. This exploration marks an important step toward professionalizing their operations. The program further contributed to building the business management capacity of MSMEs. Improved feed quality and reduced costs translated into greater profitability, enabling participants to reinvest in their operations. Some MSMEs reported planning to expand their poultry pens or increase flock sizes in the coming months.

The socio economic impact of the program extended beyond individual MSMEs. With improved productivity and reduced production costs, the community experienced increased availability of affordable poultry products. This availability supported local food security and strengthened the regional economy. Overall, the program successfully enhanced the technical, managerial, and ethical capacities of poultry-farming MSMEs. The combination of training, mentoring, and field implementation resulted in meaningful improvements in productivity, economic efficiency, and halal compliance. The long-term networks formed through the program are expected to support sustained development among participating MSMEs.

CONCLUSIONS

The community service program successfully enhanced the capacities of poultry-farming MSMEs in formulating halal, affordable, and nutritionally balanced feed. Through a structured series of workshops, practical demonstrations, and mentoring sessions, participants developed a deeper understanding of both halal principles and

feed formulation techniques. This strengthened foundation enabled MSMEs to recognize the importance of ensuring halal integrity throughout the feed production chain, from ingredient selection to storage and handling practices. Such knowledge is essential for promoting ethical livestock production and supporting consumer trust in halal-based products.

The program also demonstrated that MSMEs are capable of developing effective and low-cost feed formulas using locally available agricultural by-products. Ingredients such as tofu residue, coconut pulp, banana peels, bean sprout skins, taro corm residue, and rice bran proved valuable in creating nutritionally balanced feed mixtures. By substituting commercially manufactured feed with these locally sourced materials, MSMEs were able to significantly reduce production expenses without compromising poultry performance. This economic benefit is particularly important for small-scale farmers who often face fluctuating feed prices and limited financial resources.

Field testing confirmed that the formulated feed contributed to noticeable improvements in poultry growth, health, and productivity. Broilers showed increased weight gain and improved feed conversion ratios, while layer chickens demonstrated higher hen-day production. These results highlight the potential of community-based feed formulation initiatives to deliver measurable outcomes that positively affect farmers' operational efficiency. The success of the field trials also strengthens MSMEs' confidence in continuing to develop and refine their own feed products beyond the duration of the program.

Beyond technical and economic outcomes, the program cultivated stronger managerial practices among MSMEs. Participants adopted better documentation procedures, improved feed storage methods, and collaborated more actively with peers and local suppliers. These improvements reflect a shift toward more professional and sustainable business operations. The cooperative networks formed during the program are expected to support ongoing innovation, resource sharing, and long-term continuity of the feed formulation initiative within the community.

Overall, the program illustrates the transformative impact of capacity-building interventions in empowering poultry-farming MSMEs. By integrating halal assurance, cost efficiency, and nutritional adequacy into feed formulation practices, the program contributed to strengthening local food security and enhancing economic resilience. The success achieved through this initiative serves as a model for similar community empowerment efforts and underscores the importance of sustainable, locally driven solutions in supporting small-scale agricultural enterprises.

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