

Training on Corn-Based Healthy Nugget Innovation for BUMDes Kebontunggul

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Abstract

Purpose: This community service activity aimed to improve the knowledge and practical skills of BUMDes Kebontunggul administrators and members in processing corn into healthy nuggets as an innovative local food product with added value.

Method: The activity was conducted at Kebontunggul Village Hall through three stages: preparation, implementation, and evaluation. The preparation stage included observation, coordination with BUMDes managers, and identification of local potential and partner needs. The implementation stage consisted of material delivery on corn value addition, healthy corn-based nugget formulation, and business opportunities, followed by hands-on practice in preparing and processing the product. The evaluation stage was carried out through observation of participation and assessment of participants' understanding and practical involvement during the training.

Practical Applications: The activity showed that participants improved their understanding of corn processing as a value-added product, were able to follow the stages of making healthy corn-based nuggets, and gained broader insight into the potential development of local food-based business initiatives within the BUMDes environment.

Conclusion: This activity contributed to strengthening community capacity in local food diversification, increasing awareness of healthy food innovation, and supporting the initial development of corn-based products as a potential BUMDes business initiative.



Introduction

Today's village economic development no longer relies solely on the sale of agricultural commodities in the form of raw materials, but rather needs to be directed toward strengthening added value through innovation in local products. In the village context, Village-Owned Enterprises (BUMDes) have a strategic role as an instrument of economic empowerment, as BUMDes are legally established to manage village potential, develop businesses, and improve the welfare of village communities (PPRI, 2021). Strengthening the role of BUMDes is becoming increasingly relevant amidst national development efforts that emphasize commodity downstreaming, strengthening the local economy, and village independence (Wattiheluw & Loupatty, 2025).

Kebontunggul Village, Gondang District, Mojokerto Regency, has agricultural potential that can be developed as a basis for strengthening the community's economy. One commodity with strategic value is corn (Suryani et al., 2025). Nationally, corn is an important food commodity after rice, with a major role not only as a food ingredient, but also as an economic commodity that is widely distributed in various regions of Indonesia. (PDSIP, 2024) explained that data from the Ministry of Agriculture shows that corn remains an important commodity in the national food crop production structure, so its development should not stop at the cultivation aspect, but also needs to be directed at diversifying food products with added value.

However, the potential for corn at the village level is often not matched by adequate post-harvest processing capabilities. Communities generally still sell corn raw or as simple food items with relatively low economic value. This situation results in suboptimal economic benefits for farmers and villagers. Several previous community service activities have shown that processing corn into innovative products can enhance community creativity, expand household business opportunities, and open up space for the development of businesses based on local potential (Baidhawi et al., 2025). Corn processing training, including in the form of frozen food and other processed foods, has also been proven to help people understand aspects of production, packaging and marketing better (Rauf et al., 2023).

On the other hand, innovations in corn processing also need to be interpreted within the framework of current health and food issues. Indonesia currently faces a dual challenge: on the one hand, it is still working to reduce nutritional issues such as stunting, and on the other, it is facing increasing consumption of unhealthy processed foods (Fitriyani, Ardiyanto, et al., 2024). The results of the 2024 SSGI show that the national stunting prevalence remains at 19.8%, so efforts to provide nutritious, affordable, and locally resource-based food remain an important agenda (Kemkes.go.id, 2025). At the same time, the WHO highlighted that the consumption of unhealthy foods containing excessive sugar, salt, and fat is increasingly dominating Indonesian consumption patterns. This situation demands food innovations that are not only economical and popular, but also healthier and more nutritious (WHO, 2026).

In this context, training in making healthy corn-based nuggets is relevant as a form of community service. Nuggets are a product that is familiar to consumers, practical, and has good market potential (Akesowan, 2021). However, widely sold nugget products are often perceived as unhealthy processed foods if their composition is not considered. Therefore, innovations in corn-based nuggets can be a food alternative that utilizes local commodities, increases fiber content or specific nutritional values according to the formulation, and provides a healthier product choice for the public. Studies on the use of corn flour in nugget products also show that corn has the potential to be processed into products that are organoleptically acceptable to consumers (Tamsen et al., 2018).

Kebontunggul Village, Gondang District, Mojokerto Regency, has a clear empirical basis for a corn-processing empowerment program. The official village profile records that Kebontunggul covers 263.215 hectares and has a population of 1,836 people, indicating that the intervention is situated in a rural community with a manageable demographic scale for village-based productive activities. More specifically, BPS data for Gondang Subdistrict show that Kebontunggul had 225 hectares of maize harvested area in 2023, one of the larger maize

areas among villages in the subdistrict. These data strengthen the argument that corn is not merely a general village commodity, but a locally available agricultural resource with sufficient scale to justify downstream processing into higher-value products rather than continued dependence on raw commodity sales alone.

Table 1. Products of Kebontunggul Village-Owned Businesses

Featured Product	Raw Material	Business Advantage
Yogurt	Cow's Milk	Healthy Drink
Chips	Banana, Cassava	Local snack
Jamu	Turmeric	Herbal Medicine

Source: Author's Work, 2026.

BUMDes Kebontunggul has developed several featured products based on locally available resources, including yogurt made from cow's milk as a healthy beverage, chips produced from banana and cassava as local snack commodities, and traditional herbal drinks (jamu) derived from turmeric as part of community-based herbal medicine products. These products reflect the existing capacity of BUMDes in utilizing agricultural and livestock resources into value-added goods with market potential. However, despite the significant availability of corn as a local commodity, it has not yet been optimally developed into a flagship processed product. Therefore, the introduction of corn-based innovations, such as healthy corn nuggets, is necessary to diversify the product portfolio and strengthen the economic role of BUMDes through the development of new, competitive, and market-oriented local food products. For BUMDes Kebontunggul, this training is not only meaningful as a technical skills activity, but also as a strategy for empowering the community economy based on local potential (Andika et al., 2024). Processing corn into healthy nuggets can encourage the creation of new businesses, expand the involvement of women's groups and village MSMEs, and strengthen the village business chain from raw material production to processed product marketing. This approach aligns with the direction of village economic development, which positions Village-Owned Enterprises (BUMDes) as drivers of collective community enterprises and managers of added value to local resources.

Based on these conditions, several key issues can be identified. First, corn's potential as a leading commodity has not been utilized through innovative processed products with higher sales value. Second, the capacity of communities, particularly BUMDes partners, to process corn into modern, healthy, and marketable food products remains limited. Third, understanding the importance of local food diversification, which simultaneously supports family nutritional needs and village economic business opportunities, still needs to be strengthened. Fourth, the suboptimal integration between local agricultural potential, innovative products, and village economic institutions has resulted in underutilization of opportunities to increase community income.

Based on this, this community service activity was implemented in the form of training on making healthy corn-based nuggets at the Kebontunggul Village-Owned Enterprise (BUMDes). This activity is expected to increase the community's knowledge and skills in processing corn into innovative products, strengthen the BUMDes' role in developing productive village businesses, and encourage economic empowerment through diversification of local foods that are healthy, value-added, and adaptable to current market needs.

Method

This community service was carried out at the Kebontunggul Village Hall with participants being BUMDes administrators and members. As stated by (Fitriyani, Rachmawati, et al., 2024) The implementation method used consists of the preparation stage, implementation stage, and evaluation stage for the activity entitled Strengthening the Community Economy in Corn Innovation Training to Become Healthy Nuggets at the Kebontunggul Village-Owned Enterprise.

During the preparation phase, the team conducted initial observations and coordinated with the Kebontunggul Village-Owned Enterprise (BUMDes) management to identify local potential, partner needs, and key challenges faced by the community in utilizing corn as a leading village commodity. This phase included mapping business conditions, corn raw material availability, selecting training participants, developing materials, and preparing tools and materials for healthy nugget-making training. According to (Ghozali et al., 2025) The preparation phase is also aimed at ensuring the program aligns with the function of the Village-Owned Enterprise (BUMDes) as a village legal entity that operates businesses, utilizes assets, and develops productivity for community welfare. An initial approach, including site surveys and identifying partner needs, is crucial to ensure the training program truly aligns with field conditions and focuses on strengthening the community's economy.

During the implementation phase, activities took the form of training and hands-on practice. The training materials included an introduction to the added value of corn, healthy corn-based nugget formulations, income generation, ingredient recognition practices, and nugget-making practice. Participants not only received theoretical explanations but also directly demonstrated the process of making healthy nuggets, from preparation and mixing, molding, steaming or frying, to product packaging. According to (Fahrullah et al., 2023) This type of training model is considered effective in community empowerment activities because it can improve technical skills while also opening up insights into local potential-based businesses. Mentoring during the practice is also crucial so participants can replicate the production process independently after the activity is complete.

In the evaluation phase, the community service team assesses the program's success through process and outcome evaluation. The evaluation process involves observing participant attendance, active participation, engagement during practical sessions, and the smoothness of each training stage. Meanwhile, outcome evaluation is conducted through a pre- and post-training assessment of participant understanding, for example, using focused discussions, Q&A sessions, or simple pre- and post-tests related to knowledge of ingredients, production stages, packaging, and the business potential of corn nuggets. According to (Fitriyani, Dewianawati, et al., 2024) The evaluation can also be supplemented with an assessment of the quality of the participants' products, such as taste, texture, appearance, and neatness of packaging. This evaluation stage is crucial for measuring the participants' knowledge and skills and providing a basis for further program improvements so that corn processing innovations can truly develop into productive businesses within the Kebontunggul Village-Owned Enterprise (BUMDes). The evaluation of this community service program employed a simple training-assessment design using two main instruments: (1) a structured pre-test and post-test to measure changes in participants' knowledge, and (2) an observation sheet to assess practical performance during the corn-based nugget production session. The knowledge test covered four indicators, namely participants' understanding of corn as a value-added commodity, knowledge of processing stages, awareness of hygiene and food handling practices, and basic understanding of packaging and business potential. Meanwhile, the observation sheet measured practical indicators such as participants' ability to prepare materials correctly, follow processing procedures, maintain hygiene during practice, and produce nuggets with acceptable texture, shape, and appearance (Muntafiah et al., 2021). The collected data were analyzed descriptively by comparing pre-test and post-test results and by summarizing the observed level of participant engagement and technical competence during the training. This evaluation approach is in line with community service studies that use pre-test/post-test and observational assessment to document changes in participant knowledge and practical skills (Rahayu et al., 2025).

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Result

The community service program was implemented in three main phases: preparation, implementation, and evaluation. In the preparation phase, the team conducted initial observations and coordinated with the managers of BUMDes Kebontunggul to identify local conditions, the potential of corn as a village commodity, and community needs related to local food-based business development as figure 1,

Figure 1. Observation and Coordination with BUMDes Managers



Source: Private Documentation, 2026.

The observation revealed that corn was one of the village's promising commodities; however, its utilization was still largely limited to raw sales or simple processing. Coordination with BUMDes also resulted in a shared understanding that the training should not only focus on technical processing skills but also on increasing the economic value of corn-based products. This phase provided an important foundation for designing a program that was relevant to local needs and aligned with the goal of strengthening the village economy. In the implementation phase, the activity was carried out through lectures and hands-on practice. The first session, delivered by Harjo Lukito, S.E., M.M., as Figure 2,

Figure 2. Presentation of Material on Added Value of Corn Products



Source: Private Documentation, 2026

Figure 2 focused on the added value of corn. Participants were introduced to the idea that corn should not merely be sold as a primary commodity, but should be transformed into processed products with higher market value. The second session, delivered by Nurus Sabani, S.E., M.Si., as figure 3,

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Figure 3. Presentation of Healthy Nugget Formulation Material



Source: Private Documentation, 2026.

Figure 3 discussed the formulation of healthy corn-based nuggets. This session emphasized the importance of balancing nutritional value, texture, color, sensory acceptance, and consumer perception in developing healthier local food products. The third session, presented by Buyung Cahya Perdana, S.E., M.S.A., as figure 4.

Figure 4. Presentation of Income Increase Material



Source: Private Documentation, 2026.

Figure 4 addressed income improvement by discussing market opportunities, simple cost calculations, selling prices, profit margins, and the prospects of developing corn nuggets as a household or BUMDes business product. After the theoretical sessions, participants joined practical activities. Oktaviani Permatasari, S.E., M.M. as figure 5,

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Figure 5. Material Preparation and Introduction Practice



Source: Private Documentation, 2026.

Figure 5 guided the participants in ingredient preparation and material recognition, including raw material selection, accurate weighing, tool preparation, and hygiene procedures. The practical session on making healthy corn-based nuggets was then led by Zenita Afifah Fitriyani, S.TP., M.M., as figure 6,

Figure 6. Corn-Based Nugget Making Practice



Source: Private Documentation, 2026.

Figure 6 covering mixing, shaping, cooking, and presenting the final product. Participants were actively involved throughout the process and showed strong enthusiasm during both the material sessions and the hands-on practice.

In the evaluation phase, the program showed positive outcomes in terms of both knowledge and practical skills. Participants demonstrated a better understanding of corn as a value-added commodity rather than merely a raw agricultural product. They were also able to follow the nugget-making process from preparation to final production, indicating improved technical competence. In addition, the session on income improvement broadened participants' perspectives on potential business opportunities based on local food products.

Overall, the evaluation suggested that the participants had gained useful knowledge, practical abilities, and entrepreneurial awareness that could support the future development of corn-based products within the BUMDes environment.

Table 2. Result Data Pretest and Posttest

No	Question	<i>Pretest</i>	<i>Posttest</i>
1	What is the main advantage of processing corn into value-added products such as healthy nuggets compared to selling it as raw material?	35%	95%
2	What are the key steps involved in making corn-based healthy nuggets (from preparation to final product)?	29%	90%
3	What hygiene and food safety practices should be applied during the production of corn-based nuggets?	25%	90%
4	How can corn-based healthy nuggets be developed into a potential business product within the BUMDes environment?	23%	80%

Source: Author's Work, 2026.

The results of the pre-test and post-test indicate a significant improvement in participants' knowledge and understanding after the training. Initially, participants showed relatively low levels of comprehension across all indicators, with scores ranging from 23% to 35%, reflecting limited prior knowledge of corn processing, production stages, hygiene practices, and business potential. After the training, the post-test results increased substantially, reaching 80%–95% across all questions. The highest improvement was observed in understanding the advantages of value-added corn processing (from 35% to 95%), while knowledge of production steps and hygiene practices also showed notable gains (from 29% to 90% and 25% to 90%, respectively). Although the business-related question showed slightly lower post-test results (80%), it still demonstrated a considerable increase from the initial level (23%). Overall, these findings suggest that the training was effective in enhancing participants' knowledge and awareness, particularly in technical and conceptual aspects of corn-based product innovation within the BUMDes context.

Discussion

The findings of this program indicate that the training successfully responded to the initial problems identified in the village, particularly the underutilization of corn as a value-added product. The preparation phase was crucial because it ensured that the program was designed according to the real needs of the partner community. This result is consistent with the view that community empowerment programs are more effective when they begin with contextual observation, needs assessment, and alignment with local institutional roles, especially those of BUMDes as drivers of village-based economic development (PPRI, 2021);(Wattiheluw & Loupatty, 2025). The positive response from BUMDes managers also suggests that the program matched the local development agenda and had practical relevance for strengthening community income.

The implementation phase demonstrated that combining conceptual material with practical training is an effective approach in community service activities. The session on the added value of corn strengthened participants' understanding that local agricultural commodities can generate higher returns when processed into innovative products. This supports previous findings that value-added corn processing can increase local economic potential and improve community capacity (Mahmud et al., 2026); (Shiferaw et al., 2011). Likewise, the session on healthy nugget formulation highlighted that food innovation should

not focus solely on product acceptability, but also on nutritional quality and health aspects (Baali et al., 2023). This is in line with studies showing that different starches and flour substitutions affect the oil content, texture, and overall quality of nuggets, making formulation an important factor in healthier product development (Faloye et al., 2024);(Widoretno et al., 2023). Therefore, the training did not merely introduce a new product, but also encouraged participants to view corn nuggets as a viable healthy food innovation based on local resources.

The income improvement session further enriched the program by linking technical production skills with economic feasibility. Participants were encouraged to understand that product innovation alone is insufficient unless accompanied by basic entrepreneurial skills, such as calculating production costs, setting selling prices, and identifying market opportunities (Sudirjo et al., 2023). This supports previous studies showing that local food processing training can stimulate entrepreneurship and help increase household income when combined with business-oriented assistance (Amajida et al., 2021);(Fahrullah et al., 2023);(Niswa & Swasono, 2026). In this sense, corn-based healthy nuggets can be interpreted as a potential village business product that may strengthen both household enterprises and the collective economic role of BUMDes.

The practical sessions on ingredient preparation and nugget production also played a central role in the success of the program. Participants did not only receive theoretical explanations, but also experienced the full production process directly. This hands-on approach improved their confidence and technical readiness to reproduce the product independently (Fitriyani et al., 2022). The result is consistent with previous community empowerment programs showing that participatory training and direct practice are effective in building technical competence and encouraging local product innovation (Pramudya et al., 2021);(Azizah et al., 2020). The participants' enthusiasm during the practice, question-and-answer session, and closing activities further indicates that the training was well received and created active engagement among the community (Rahayu et al., 2025).

The program in Kebontunggul showed that the training was successful as an initial capacity-building intervention, particularly in improving participants' knowledge and technical readiness to process corn into a value-added food product. This is reflected in the pre-test and post-test results, which increased from 35% to 95% for understanding the added value of corn, from 29% to 90% for knowledge of production stages, from 25% to 90% for hygiene and food safety practices, and from 23% to 80% for understanding the business potential of corn-based nuggets. These findings indicate that the combination of explanation sessions and direct practice was effective in strengthening participants' cognitive and practical competence. This result is consistent with community empowerment literature showing that participatory training and product diversification activities are more effective when local commodities are linked to concrete processing skills and product innovation. Similar community-service programs on corn and local commodity downstreaming also report that training can improve community creativity, technical understanding, and initial motivation for value-added entrepreneurship, especially when the intervention is grounded in local resource potential (Nihayah et al., 2024).

However, the program has not yet fully succeeded in demonstrating stronger institutional and economic outcomes at the BUMDes level. Although participants showed better understanding and were able to follow the nugget-making process, the activity has not yet produced evidence that corn-based healthy nuggets are ready to become a sustainable BUMDes business line. No direct income measurement, market acceptance test, shelf-life test, licensing process, or feasibility analysis was completed during this stage. In this sense, the findings suggest that the program was effective in building awareness and basic production skills, but still limited in moving from training outcomes to business consolidation. This critical point is in line with the broader empowerment literature showing that local food innovation training alone is not sufficient to create durable economic impact unless it is followed by assistance in packaging, legality, branding, and market access. Therefore, in Kebontunggul, what has been achieved is best understood as a strong initial empowerment

outcome, while the transformation of corn nuggets into a commercially viable and institutionally embedded BUMDes product remains a follow-up agenda rather than a completed result (Darojat & Utarie, 2022).

Finally, the evaluation results suggest that the program functioned as an initial but meaningful step toward strengthening the local economy through food diversification. Participants not only improved their practical skills in producing healthy corn-based nuggets, but also developed a broader awareness of the importance of product innovation, healthy food, and village-based entrepreneurship. These outcomes indicate that the integration of preparation, material delivery, practical training, and evaluation created a comprehensive empowerment model. However, for stronger long-term impact, follow-up assistance is still needed, particularly in packaging, shelf-life testing, licensing, digital marketing, and business development. Thus, the program can be seen as an effective starting point for developing corn nuggets into a sustainable flagship product of BUMDes Kebontunggul

Conclusion

The community service activity on training in corn-based healthy nugget innovation at BUMDes Kebontunggul can be concluded as an effective initial intervention for improving participants' knowledge and practical skills in processing corn into a value-added local food product. The results of the training showed a clear increase in participants' understanding, as reflected in the pre-test and post-test improvement on the topics of corn value addition, production stages, hygiene practices, and the business potential of corn-based nuggets. In this regard, the program succeeded in strengthening participants' initial capacity and awareness regarding local food diversification and the potential use of corn as a more innovative village-based product.

However, the findings also indicate that the program outcomes should be interpreted within the actual scope of the intervention. The activity was successful in building technical competence and entrepreneurial awareness, but it has not yet provided direct evidence of increased income, product commercialization, or sustainable institutional integration into the BUMDes business system. Important aspects such as consumer acceptance testing, shelf-life testing, business licensing, packaging standardization, and feasibility analysis have not yet been completed. Thus, the main lesson learned from this program is that training can serve as a strong entry point for community empowerment, but it must be followed by structured assistance in product development, legality, and market access in order to generate more sustainable economic impact. Therefore, future programs should prioritize follow-up support in these areas so that corn-based healthy nuggets can develop from a training output into a feasible and competitive BUMDes product

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