ABDIMAS TALENTA
Jurnal Pengabdian Kepada Masyarakat
Journal homepage: https://talenta.usu.ac.id/abdimas

FGD on Optimizing Corn Chip Production: Implementation of Innovative Equipment Technology in Corn Chip SMEs 513

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ARTICLE INFO

Article history:
Received : 24 January 2026
Revised : 27 April 2026
Accepted : 05 May 2026
Available online: 17 July 2026

E-ISSN: 2549-418X
P-ISSN: 2549-4341

How to cite:
Mulya, M.B., Hamid, M., Nursal, Aris, A.Z., Nughoro, N.S., Ismaya, S.M., Salsabila and Amanda, N. (2026). FGD on Optimizing Corn Chip Production: Implementation of Innovative Equipment Technology in Corn Chip SMEs 513. ABDIMAS TALENTA: Jurnal Pengabdian Kepada Masyarakat, 11(1), 13-17.

http://doi.org/10.32734/abdimastalenta.v11i1.25331

ABSTRACT

This Focus Group Discussion (FGD) aims to identify strategies for optimizing corn chips (emping jagung) production through the implementation of innovative equipment technology in Micro, Small, and Medium Enterprises (MSMEs) in Bekiung Village, Langkat Regency. Bekiung Village is known as an agricultural area with abundant corn production, where corn is processed into emping jagung as a local snack product. However, the processing activities are still conducted manually, which limits production capacity and efficiency and becomes an obstacle in supporting the agricultural sector that remains the main economic pillar of the village. Through the FGD involving community members, village authorities, and the Village-Owned Enterprise (BUMDes) Bangun Mandiri Bekiung, various issues related to production constraints and technology needs were discussed. As a result, the implementation of innovative equipment technology was introduced as a practical solution to improve the efficiency and quality of corn processing. The program includes socialization on the benefits of corn processing, training on transforming corn into economically valuable products, provision of appropriate technology equipment to assist production, as well as continuous mentoring and evaluation to maintain product quality and market competitiveness. The results of the FGD indicate an increase in community understanding of technology utilization, stronger collaboration between stakeholders, and the development of a sustainable production improvement strategy. Therefore, the integration of community participation through FGD and the application of innovative equipment technology represents an effective approach to enhance productivity, strengthen rural economic resilience, and support the sustainable development of MSMEs in Bekiung Village.

Keyword: Focus Group Discussion (FGD), Corn Chips Production, Innovative Equipment Technology, MSMEs, Community Empowerment, Rural Economic Development

1. Introduction

Bekiung Village, located in Kuala District, Langkat Regency, North Sumatra Province, has significant agricultural potential, with corn as one of its main commodities. This crop is not only sold as raw material but also processed into value-added products such as corn chips (*emping jagung*), a traditional snack produced through flattening and drying processes. This product reflects local community innovation in utilizing agricultural resources to improve rural economic welfare.

However, the production process of corn chips in Bekiung Village still faces several technical constraints. Drying, which relies heavily on sunlight, is often disrupted by weather conditions, particularly during the rainy season. In addition, the absence of sorting equipment results in non-uniform raw materials, while manual flattening limits production capacity and consistency of product quality. These challenges indicate the need for technological improvements in the processing stages.

According to Sukardi, high moisture content in corn kernels can reduce product quality and accelerate spoilage, making effective drying a crucial factor [1]. Furthermore, Mulyana reported that solar-based drying technology can improve efficiency by up to 40% compared to conventional methods, while maintaining stable temperatures and ensuring hygienic processing conditions [2]. In addition to drying, the sorting stage plays an important role in determining product quality. Suryani stated that variations in kernel size and moisture content can affect the texture and color of corn chips, highlighting the importance of simple mechanical sorting tools to ensure uniformity of raw materials [3].

The flattening stage is also critical in shaping the final product. Prasetyo and Hidayat found that the use of small-scale corn flattening machines can increase production capacity up to three times compared to manual methods, while producing more uniform and consistent results [4]. Moreover, Rahmawati emphasized that the application of appropriate technology based on local potential can strengthen rural economies, improve production efficiency, and create new employment opportunities [5].

Therefore, the development and implementation of improved processing technologies for corn chips in Bekiung Village represent a strategic effort to enhance the competitiveness of local products. This initiative is expected to support economic growth, improve food security, and promote sustainable production systems aligned with the Sustainable Development Goals (SDGs), particularly Goal 2 (Zero Hunger), Goal 8 (Decent Work and Economic Growth), and Goal 12 (Responsible Consumption and Production).

2. Methods

2.1. Research Methodology

The implementation of this community service program in Bekiung Village employed a participatory and collaborative approach through Focus Group Discussions (FGD), non-formal education, and the application of innovative equipment technology to support the optimization of corn chips (emping jagung) production in local MSMEs. This approach aimed to enhance community capacity in utilizing appropriate technology, improving production efficiency, and increasing product quality and competitiveness, thereby contributing to the strengthening of the local economy and community welfare.

2.2. Community Service Location

The community service activity was carried out in Bekiung Village, Langkat Regency. The location was selected due to its potential in corn agriculture and the development of corn chips (emping jagung) production by local MSMEs. Bekiung Village is located approximately 70 km from the Universitas Sumatera Utara, with a travel time of about 1 hour and 34 minutes by car, as illustrated in Figure 1 below.

Figure 1. Bekiung Village

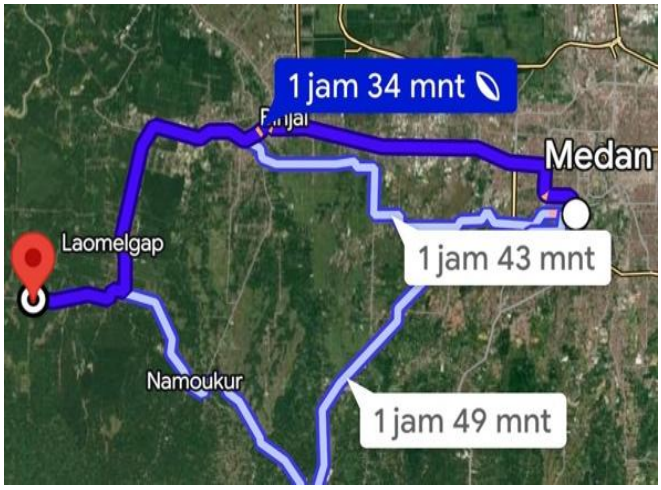

Figure 2. Location map of partner network from the Universitas Sumatera Utara

2.3. Application of Innovative Equipment Technology

The application of innovative equipment technology in Bekiung Village is implemented through a community-based and participatory approach to support the optimization of corn chips (emping jagung) production in local MSMEs. Corn, which was previously processed manually, is now processed using appropriate technology equipment to improve production efficiency and product quality. The process begins with preparing raw corn materials, followed by cleaning and processing using innovative equipment designed to simplify and accelerate production activities. The integration of technology aims to reduce manual labor, increase production capacity, and ensure more consistent product quality. Community members, especially MSME actors and members of BUMDes Bangun Mandiri Bekiung, are directly involved through training and hands-on practice, enabling knowledge transfer and strengthening community skills in using the equipment. Evaluation is conducted by observing improvements in production efficiency, product quality, and the overall productivity of the emping jagung business.

The production process of corn chips (emping jagung) using innovative equipment is carried out through several stages. First, prepare the main raw material, namely dried corn kernels, along with supporting tools such as corn processing equipment, grinders, and drying media. Second, clean and sort the corn to ensure the quality of the raw materials used in the production process. Next, process the corn using innovative equipment that helps flatten or shape the corn into thin chips. After that, the formed corn chips are dried to reduce moisture content and improve durability. The dried chips are then fried until they reach the desired texture and crispness. Finally, the finished emping jagung is cooled, packaged, and prepared for distribution or marketing.

3. Results and Discussion

Technology plays a crucial role in improving the efficiency and productivity of small and medium enterprises (SMEs), particularly in the food processing sector. One relevant application is the implementation of innovative equipment technology in corn chip production. Through the Focus Group Discussion (FGD) conducted with corn chip SMEs, several key findings were obtained regarding production challenges, technology adoption, and potential optimization strategies. The FGD revealed that most corn chip SMEs still rely on conventional production methods, especially in the processes of slicing, frying, and packaging. These manual methods result in inconsistent product quality, low production capacity, and higher labor intensity. For instance, manual slicing often produces uneven thickness, which affects frying uniformity and ultimately the texture and taste of the final product.

In addition, traditional frying methods without temperature control lead to inconsistent product quality and increased oil consumption. To address these issues, the introduction of innovative equipment technology was discussed and partially implemented. The key technologies include automatic corn slicers, temperature-controlled frying machines, and semi-automatic packaging tools. The use of an automatic slicer significantly improved the uniformity of corn slices, resulting in more consistent frying outcomes. Meanwhile, the frying machine equipped with temperature control ensured optimal cooking conditions, reducing the risk of

overcooking or undercooking and improving product quality. Furthermore, the implementation of semi-automatic packaging tools enhanced efficiency in the final stage of production. Packaging time was reduced, and the products achieved better sealing quality, which contributes to longer shelf life and improved product appearance. These improvements are important for increasing competitiveness in the market, especially when targeting wider distribution channels.

Figure 3. Focus Group Discussion with corn chip SMEs

Figure 4. Demonstration of innovative equipment technology The FGD also highlighted several challenges in adopting new technology.

The primary constraint is the limited financial capacity of SMEs to invest in modern equipment. In addition, there is a lack of technical knowledge and skills required to operate and maintain the machinery. To overcome these barriers, training and mentoring programs were introduced as part of the initiative. These programs aim to enhance the technical capacity of SME actors and ensure sustainable utilization of the technology.Another important finding is the positive perception of SME participants toward technology adoption. Most participants acknowledged that innovative equipment can significantly reduce production time, improve product consistency, and increase overall productivity. Some SMEs reported an increase in production capacity of up to two to three times after adopting the new equipment, along with a reduction in production costs in the long term. From an economic perspective, the optimization of corn chip production through technology implementation contributes to increased income potential for SMEs. Higher production capacity and improved product quality enable SMEs to expand their market reach and compete with larger producers. From a social perspective, this initiative also supports community empowerment by creating more structured and efficient production systems.

Overall, the results of the FGD demonstrate that the implementation of innovative equipment technology is an effective strategy for optimizing corn chip production in SMEs. It provides a practical solution to existing production challenges while offering significant benefits in terms of efficiency, product quality, and economic value. However, continuous support in the form of training, financial assistance, and technical guidance is essential to ensure the sustainability and scalability of this approach.

4. Conclusion

The optimization of corn chip (*emping jagung*) production through the application of technology and processing equipment innovation represents a concrete effort to enhance the capacity of rural communities in managing local resources productively and sustainably. This program reflects a collaborative synergy between the Universitas Sumatera Utara (USU) and the Universiti Putra Malaysia (UPM), integrating research, technology, and community empowerment to generate sustainable socio-economic impacts in Bekiung Village.

The implementation of solar energy and efficient corn processing equipment has successfully introduced environmentally friendly appropriate technologies while improving production efficiency and product quality. In addition, the program has strengthened community skills in operating processing tools, managing hygienic drying processes, and understanding quality standards for local products.

Overall, this initiative not only contributes to economic improvement but also supports sustainable rural development through a research-based approach. It is expected that Bekiung Village can serve as a model of an innovative village that utilizes appropriate technology to enhance community welfare, while this cross-university collaboration may continue to expand into broader sectors in the future.

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