



Implementation of Geblek Processing Training for Micro, Small Medium Enterprise (MSMEs) in Kulon Progo Regency

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Abstract

Cassava-based food processing techniques produced by MSMEs in Kulon Progo Regency are a healthy food choice for the community. The purpose of this community service is to improve the skills of MSME actors in processing cassava into healthy food. This community service is carried out using two methods, namely: 1) training and 2) assistance to geblek MSME actors in Kulon Progo Regency. The training was carried out for one hundred minutes by doctors and public health practitioners. The pre-test was carried out before the training, while the post-test was carried out after the training. During the training, the group discussion method was inserted to increase the understanding of MSMEs geblek actors in producing healthy food made from cassava. Assistance is carried out for two hours by a doctor to determine the level of skill of MSME actors in processing cassava into geblek. The pre-test and post-test scores for geblek processing training for MSMEs in Kulon Progo Regency showed an increase of 3.76%. The results of this community service have succeeded in changing the technique and composition of the geblek seasoning to be healthier. The change in seasonings that no longer use monosodium glutamate (MSG) and this way of serving without oil has a distinctive taste, namely: lighter and tastier. Geblek SMEs have skills in processing cassava into geblek with Non-MSG and Non-Oil spices. This innovation can be used as an alternative food for people with DM.

1. Introduction

MSME actors are key promoters of economic activity within both low and middle-income communities. They are vital assets supporting Indonesia's national economy, tasked with developing innovation, skills, knowledge, and digital transformation capabilities. Additionally, community health cadres have the capacity to motivate the community, including MSME entrepreneurs, to improve their health status. Both MSME actors and health cadres hold strategic positions in implementing regional economic development programs and non-communicable disease (NCD) prevention programs, especially for Diabetes Mellitus (DM).

The 2018 Basic Health Research (Riskesmas) report indicated an increase in the prevalence of DM in Indonesia, with Yogyakarta Special Region (DIY) being the province with the second highest prevalence of DM. Of the 26,915 people with NCDs, 38.1% had DM. Achieving 100% success in controlling DM can be approached by regulating diet, as dietary management is crucial in reducing DM prevalence. Assistance to MSME entrepreneurs in producing healthy foods can enhance understanding of the importance of healthy eating (Kulon Progo District Health Office, 2022).

In Kokap Subdistrict, Kulon Progo District, hypertension ranks second highest with 467 cases, while DM ranks thirteenth with 217 cases. The high prevalence of these conditions poses a serious problem, contributing to increased morbidity and mortality in the community (Sari, D. N., et al., 2023; Amin, C., et al., 2023). Primary prevention efforts, such as early detection of risk factors, are vital in preventing DM (Health Research and Development Agency, 2019; Ministry of Health of the Republic of Indonesia, 2017). One preventive measure is providing healthy food to the community to prevent DM. Small and Medium Enterprises (SMEs) play an important role in national economic development, and one strategy they can employ is producing healthy food options for individuals with DM.

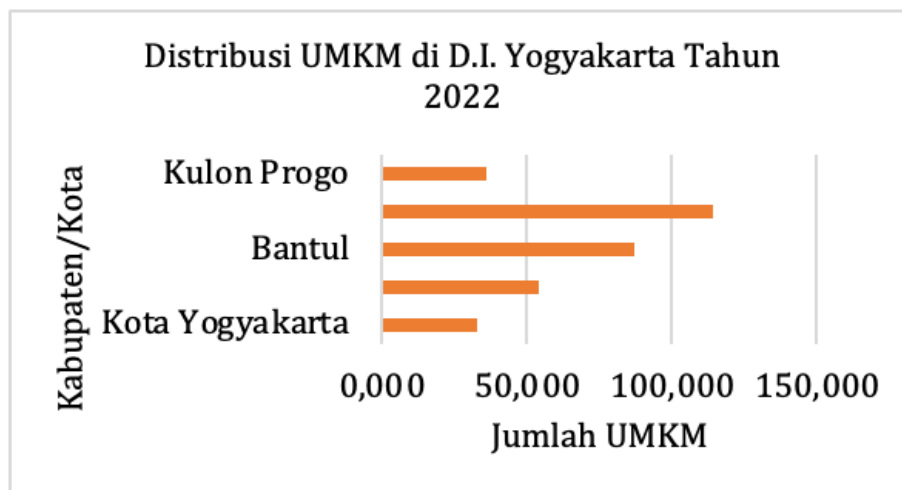


Figure 1. Distribution of MSMEs in the province of D.I. Yogyakarta in 2022. Source: Dataku Bappeda D.I. Yogyakarta, 2022.

The number of MSMEs in Indonesia has been increasing year by year, including those in Kulon Progo Regency. Kulon Progo Regency has many MSMEs that uphold local values (Kusuma, A, 2020). Geblek is a traditional food from Kulon Progo Regency, characterized by its round shape, chewy texture, and savory taste (Wibisono, S & Sari, R. M, 2015). The traditional method of processing geblek by frying it and the lack of nutritional information pose problems that need to be addressed. The effects of frying and the absence of nutritional value information can lead to the risk of consuming food that does not meet individual caloric needs.

High-calorie foods can trigger obesity, leading to hypertension (HT) and diabetes mellitus (DM). This initiative aims to support health development targets, including the SDGs 2030. According to data from the Kulon Progo District Health Office (2022), there are 217 people with DM in Kokap Subdistrict. One of the efforts that can be made is early detection

of risk factors, which contributes to Indonesia's economic development (Health Research and Development Agency, 2019; Ministry of Health of the Republic of Indonesia, 2017).

Micro, Small, and Medium Enterprises (MSMEs) are an important part of Indonesia's economic system and contribute to reducing the prevalence of DM. Enhancing geblek MSMEs with digital transformation as an iconic culinary product of Kulon Progo Regency is expected to improve community health. The production of healthy food by MSMEs, with nutritional labeling and calorie calculation for geblek bakar, is an innovation aimed at reducing the prevalence of DM. The goal of this community service is to train MSME actors to process geblek as a healthy food option for individuals with DM.

2. Methods of Implementation

The first step undertaken was a preliminary study through observation. The aim of the observation was to identify the problems faced by MSMEs in Hargomulyo Village. The second step involved interviews with the Village Head and MSME actors to identify various issues they encounter. The third step was counseling on the implementation of geblek production based on calorie calculation and healthy eating patterns. The fourth step was assistance in calculating the calories of geblek produced by MSME entrepreneurs. The tool used to measure the success of the activity implementation was a questionnaire on healthy eating patterns, calorie calculation, and geblek innovation. The questionnaire was administered before and after the community service.

The community service was conducted in Hargomulyo Village, Kokap Subdistrict, Kulon Progo Regency. It took place in February 2023. The method used to address the issues was counseling and training. The community service was carried out using both primary and secondary data. Secondary data were based on various references about healthy food products made by MSME entrepreneurs. References from 2018-2023 were used, sourced from Google Scholar, Science Direct, and PubMed Central, and selected using keywords such as DM, geblek, calories, and MSMEs.

3. Results and Discussion

3.1 Socializing

The health counseling conducted at the Hargomulyo Village Hall was attended by geblek MSME actors and the local community. The material presented focused on healthy living behaviors, specifically on how to manage diet and calculate calories. The presentation was delivered through PowerPoint (PPT) using simple language and engaging visuals. The aim of this counseling was to enhance knowledge about healthy living behaviors through healthy eating for people with DM.

The counseling was conducted using a two-way communication technique between the presenter and the participants. This method was expected to establish a reciprocal relationship. Group discussions were also conducted using the two-way communication technique. This communication technique refers to the theory of effective community to address health problems faced by the community, particularly how to manage healthy food for MSME entrepreneurs to support the DM prevalence reduction program.

Unhealthy living behaviors, especially due to eating patterns that do not meet caloric needs, are one of the biggest risk factors for DM and HT. The solution implemented to improve knowledge and skills on preventing DM and HT was through the innovation of

healthy geblek food processing. The counseling was provided by a general practitioner in Public Health who is well-trained.

Counseling and mentoring MSMEs is a process of change to achieve harmony and balance resulting from environmental changes and various health problems that arise in the community (Iyong, E. A, et al., 2020). Community health counseling also leads to the process of human growth and development towards physical, mental, and social harmony and balance with the environment, enabling them to overcome various health problems themselves and within their community (Iyong, E. A, et al., 2020).

The health counseling conducted in Hargomulyo Village used easy-to-understand language and engaging visuals. During the counseling, a questionnaire on the design of MSMEs in the field of healthy food with calorie calculation was administered. This questionnaire was distributed to the entire community before and after the intervention (Kusumo, M. P, et al., 2020).



Figure 2. Socializing for MSMe

The results of the pre-test and post-test showed an increase in the pre-test score from 39.32% to 43.08%. This increase indicates that the counseling and mentoring provided were beneficial for the local community. The community's enthusiasm for improving knowledge on healthy eating patterns and healthy living, as well as enhancing skills through geblek innovation, was very high.

Micro, Small, and Medium Enterprises (MSMEs) play a role in building the national economy based on fair economic democracy (Indonesian Law Number 20 of 2008). The growing development of MSMEs can drive the community's economic sector (Panggiarti, E. K. & Setyawan, S, 2019). The success of a region or area can be seen from its economic growth and the number of MSMEs that grow into large businesses (Anggraeni, W. C, 2021).

Government support to enhance MSMEs includes providing business licenses for entrepreneurs to operate and develop their businesses through various designed schemes (Anggraeni, W. C, 2021). The increasingly developed MSMEs can absorb a large workforce and remain resilient during global crises (Sarfiyah, S. N, 2019). In Indonesia, establishing an MSME does not require a large capital, and the necessary workforce does not demand formal education. Most MSMEs in Indonesia are located in rural areas and do not require the

infrastructure that large companies do (Sarfiyah, S. N, 2019). In low-income countries, MSMEs play a crucial role in overcoming poverty barriers and providing employment in rural areas (Tambunan, T, 2019).

3.2 Healthy Geblek Processing

The stages of innovating the production of healthy geblek are as follows: 1. Peeling and washing cassava; 2. Grating the cassava; 3. Filtering and settling the cassava starch; 4. Making dough with spices; 5. Steaming the cassava; 6. Mixing the cassava and cassava starch; 7. Making dough from steamed cassava, starch, ground garlic, and iodized salt; 8. Forming the geblek into the shape of the number eight; 9. Serving the geblek by grilling.

The processing of geblek is done through two categories based on the source of the ingredients: geblek made from cassava starch and pulp, and geblek made from cassava starch only. The geblek made from cassava starch and pulp has a richer taste, is not sour, and is softer when eaten. Meanwhile, the geblek made only from cassava starch has a sour and chewy taste.

3.3 Calorie Calculation

Calories are the amount of energy required by the body to perform its functions and activities. Calories are obtained from food and drinks (Widya, Y., Rustam, A., & Gunawan, H., 2022). One of the important factors in food is the adequacy of daily caloric intake. The process of calculating daily calories can be done using the Basal Metabolic Rate (BMR) formula for both men and women, as well as the energy unit value (Kcal) for physical activity (Soebandi, S., Tandean, & Bujali, X., 2020).

The portion size in daily servings for individuals with DM is based on their caloric needs to ensure that the food can be optimally absorbed by the body. Determining the caloric intake for individuals with DM aims to achieve and maintain an ideal body weight. The method used to calculate the required calories is by considering the basal caloric needs, which are 25 calories/kg of body weight for women and 30 calories/kg of body weight for men, adjusted for gender, age, activity, and body weight. For example, a person with an ideal body weight of 50 kg would require 1,250-1,500 calories per day (Falah, F. & Apriana, R., 2022).

3.4 Cassava Nutrition

Indonesia is a country with a vast territorial area and various natural resources that have the potential to be utilized and processed. One such potential is traditional cuisine. Traditional foods serve as an identity for a community group, easily found and recognized. Each region in Indonesia boasts culinary richness that characterizes and identifies it (Chandra, T., 2022).

Cassava (*Manihot esculenta*) is the second most important carbohydrate source after rice in tropical regions. It is also the fifth most commonly chosen staple food by the Indonesian people. Indonesia ranks second among cassava-producing countries in Asia (Irianto, H., 2022). Cassava has a wide spectrum of biological activities, including antioxidant properties, oxygen radicals, and extracts containing phenolics and flavonoids. These effects have been confirmed by several studies on experimental animals to address diabetes (Temesgen, Z., Bakalo, B., & Tamirat, H., 2019). In terms of calorie composition, 100 grams of cassava contain 110-150 calories. This calorie count is higher than that of other tubers.

Additionally, cassava is rich in complex carbohydrates and fiber. These nutrients help maintain digestive health, reduce inflammation, and control blood sugar levels. When blood sugar levels are controlled, the risk of diabetes mellitus is lower (Amaliasari, E. N., 2021).

Table 1. Nutritional Composition of Cassava per 100 grams

Ingredients	Quantity
Water	59,68 (gram)
Energy	160 (Kkal)
Protein	1,36 (gram)
Fat	0,28
Ash	0,62 (gram)
Carbohidrat	38,06 (gram)
Fiber	1,8 (gram)
Sugar	1,7 (gram)

Source: Bayata, 2019

Processing cassava in geblek form involves heating and cooling cassava starch which can influence the formation of resistant starch type 3 (RS). Resistant starch type 3 (RS) affects the body's physiological functions, namely: improving insulin sensitivity and glycemic response, increasing short chain fatty acid (SCFA) production, improving lipid profile, increasing satiety, reducing energy intake, increasing micronutrient absorption, is prebiotic, and thermogenesis. This condition shows that consumption of foods rich in RS can prevent several diseases such as DM and obesity (Sugati, D, et al, 2020).

Table 2. Geblek nutritional information

Komposisi	Kuantitas
Energi	84 (Kkal)
Protein	0 (gram)
Lemak	0 (gram)
Karbohidrat	21 (gram)
Kalori	2,150 (Kcal)

Source: Ratnaningsih et al., 2020

One serving of geblek consisting of 3 pieces weighing 40 grams contains 84 Kcal of energy and 21 grams of carbohydrates. This covers 6% of the nutritional adequacy value based on calorie requirements of 2150 kcal. These results indicate that there is an increase in the quantity of geblek that can be applied to geblek MSMEs in Hargomulyo Village with the innovation of healthy geblek, especially for people with DM and hypertension (Ratnaningsih, Devi, M. K, & Sugati, D, 2020).

The processed grilled geblek has a lighter and drier "crunchy" texture. Based on aesthetics, roasted geblek produces a combination of white, brown and black colors. This is a new color for geblek because previously it was white. This grilled geblek innovation can be developed to minimize the use of cooking oil which affects cholesterol content. Burning geblek is a technique for cooking food using heat without using additional ingredients, such as oil and margarine (Nelprawati & Faridah, A, 2019).

It is hoped that this burnt geblek can be popularized by MSME players among the public, including people with DM and HT. This is also a health promotion effort to prevent the increasing prevalence of DM and HT. Promotional efforts carried out are also influenced by social support (Kusumo, M. P, et al, 2020). The innovative result of this community service is the inclusion of nutritional information and consumption advice for 3 pieces of geblek (40 grams). This is done so that people with DM and hypertension are expected to be able to control geblek consumption in order to maintain the consumption of calories absorbed in the body. Dietary regulation is used to maintain a balance between food consumption and the body's calorie needs. One of these things is related to the blood pressure produced by the body. Implementing the DASH (Dietary Approaches to Stop Hypertension) diet can reduce systolic blood pressure by 8-14 mmHg (Anggraeni, P. T, Hidayati, T, & Kusumo, M. P, 2018).

4. Conclusion

The community service program, which employed counseling and assistance methods for MSME actors, resulted in the innovation of healthy geblek bakar food products that include nutritional value and calorie information on each package. The activities provided to geblek MSME actors and the community offered benefits related to healthy food processing. Geblek bakar with a nutrition label design is an innovation that can be further developed in the future to help control the increasing prevalence of diabetes mellitus (DM) and hypertension (HT). This community service aimed to train MSME actors in processing geblek as a healthy food option for individuals with DM and HT.

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