Introduction Of The Basic Concept Of Good Manufacturing Process On Small Medium Enterprises Of Cassava-Based Crackers

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Abstract. *One approach to enhance competitiveness among SMEs is through the implementation of Good Manufacturing Practices (GMP). However, the SMEs Slondok Puyur, which produce cassava-based crackers, currently has limited understanding and knowledge regarding the fundamental concepts of GMP. As a result, this community service initiative is designed to introduce the basic principles of Good Manufacturing Processes to the SMEs of Slondok Puyur. The community engagement involved a series of activities that included identifying the steps in the production process, followed by an introduction to the basic concepts of GMP and the exploration of potential applications of GMP within the SMEs of Slondok Puyur. The community engagement successfully informed the SMEs about the definition, aspects, and implementation steps of GMP, as well as the importance of GMP in the growth of SMEs. The community engagement activity also succeeded in identifying potential applications of GMP within the production processes of the cassava-based crackers at the SMEs located in Slondok Puyur.*

Keywords: basic concept, GMP, SMEs, slondok puyur, cassava-based crackers.

Introduction

Small and Medium Enterprises (SMEs) are vital and are frequently considered the foundation of Indonesia's economy. They make a notable contribution to the country's economic growth. In addition to being a vital component of the economy, SMEs accounted for more than 61% of Indonesia's GDP and had the potential to employ 96.5% of the entire workforce in Indonesia in 2016 (Hardi & Puspitowati, 2022; Tambunan, 2022).

SMEs in Indonesia have experienced steady and positive growth. It was reported that the number of SMEs in 2017 was more than 740 thousand units (Hardi & Puspitowati, 2022). The growth of SMEs was also seen on Central Java where the total SMEs in 2016 was 115 and 133 thousand of units in 2016 and 2017, respectively. The growth of the number of SMEs in Central Java was account for 15.5% (Soekirman & Suryani, 2020).

One of prominent SMEs that produce snack-based cassava is the Slondok Puyur SMEs located in Sumurarum village, Grabag sub-district, Magelang Regency. These products are traditional snacks made from cassava that feature a crunchy texture similar to chips and a unique flavor. The two items differ in their shapes, with slondok being flat and rectangular, approximately 2 mm thick, 1 cm wide, and around 5 cm long, while puyur is round and flat, about 2 mm thick and with a diameter of 3-4 cm (Darmanto et al., 2019; Priangkoso et al., 2020).

Although the Slondok Puyur SMEs in Grabag Magelang have made a significant impact on local economic development, like many small and medium-sized enterprises, the slondok puyur production sector faces challenges and obstacles in maintaining its market position, promoting business growth, and improving competitiveness (Darmanto et al., 2019; Priangkoso et al., 2020). A prior SWOT analysis of the Slondok Puyur SMEs revealed that their primary strength lies in the quality of their products, whereas a significant weakness is the lack of product differentiation. Regulatory policies concerning

product certification present opportunities to enhance product competitiveness, while threats arise from the high consumer demand for a variety of end products. A weakness-opportunity strategy emphasizing product differentiation and the enhancement of production equipment and facilities has been identified as a means to bolster the competitiveness of these SMEs (Priangkoso et al., 2020).

One method to improve competitiveness among SMEs is through the adoption of Good Manufacturing Practices (GMP). The application of GMP can greatly strengthen the competitiveness of SMEs by enhancing product quality, improving operational efficiency, and increasing consumer trust (Nugroho et al., 2016). Nevertheless, the Slondok Puyur SMEs currently lack understanding and knowledge regarding Good Manufacturing Practices (GMP). Consequently, this community service initiative aims to introduce the fundamental concepts of Good Manufacturing Processes to the Slondok Puyur SMEs.

Methods

The community engagement was performed by the series of activities as depicted in Figure 1. Initially, the community engagement team identified the production process of cassava based crackers in SMEs of Slondok Puyur. The identification of the production process was performed by direct surveillance and interviewing the SMEs owners. The introduction of the basic concept of GMP is performed through exposure and discussion between the community engagement team and the SMEs of Slondok Puyur. In the end session of the exposure and discussion, the community engagement identified and explored the possible application of GMP in the SMEs of Slondok Puyur.

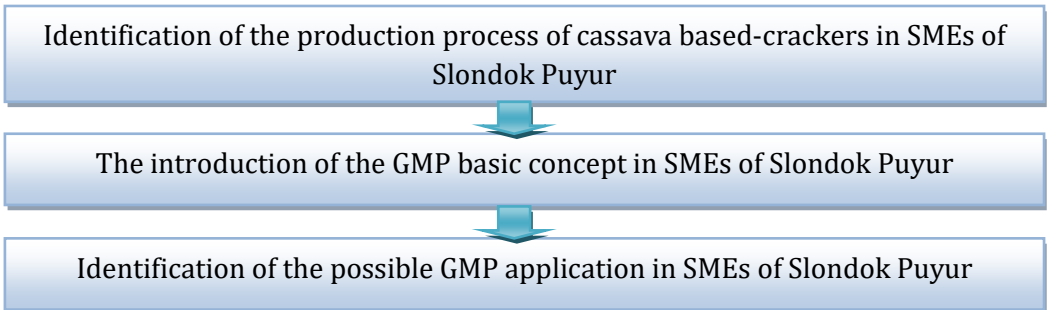

Figure 1. Series of activities of the community engagement in SMEs of Slondok Puyur

Results and Discussion

Production process of cassava based crackers in SMEs of Slondok Puyur

The production of both slondok and puyur are started by the preparation of the raw material that is consist steps of cassava skin peeling, washing, grating, pressing and steaming (Figure 2). The cassava is sourced from a local plantation in Central Java as well as purchased from other provinces across Indonesia. According to the data of the department of agriculture and food of Magelang Regency, the cassava production is up to 35.818 tons in 2017, 49.185 tons in 2020 and 27.656 tons in 2021(Badan Pangan Nasional, 2022).

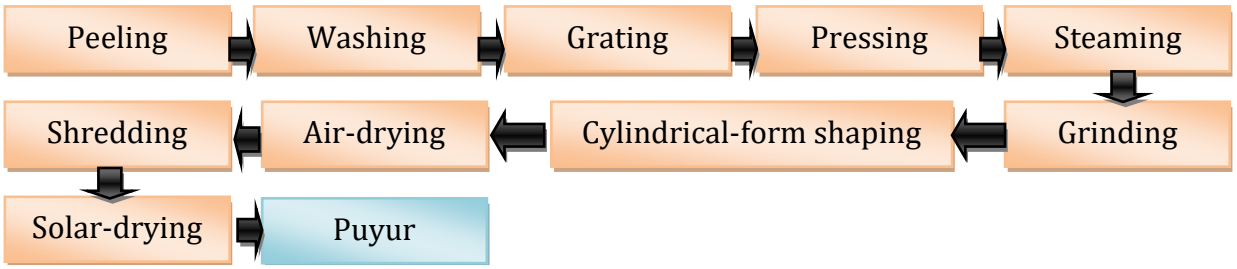

Figure 2. Production process of puyur

The cassava peeling method in the SMEs of Slondok Puyur is typically carried out by female workers (Figure 3a). The process of preparing raw dough for puyur production involves grating steamed cassava, which is then ground and shaped into a cylindrical form with a diameter of 5 cm and a length ranging from 50 to 60 cm (Darmanto et al., 2019). Once the dough has been shaped, it is left to air dry for about 2 days to decrease its moisture content, after which the puyur dough is shredded and dried. The dried puyur was then packed in plastic bag and ready to be delivered to the customers.

(a) (b) (c)

Figure 3. The peeling process of cassava (a), the stripping process of the cone's edge of the cassava dough (b), and the drying process of the cassava-based crackers (c)

The process of preparing raw dough for slondok begins with grated steamed cassava shaped into a cone, known as tumpeng, which is left to rest for 3 days. Next, the edges of the cone are trimmed to assist in the grinding step (3b). This trimming is aimed at eliminating the tough exterior of the cone-shaped cassava dough. Once the outer layer is removed, the inner portion is exposed and can be further processed more easily. The cone-shaped steamed cassava is then sliced by hand with a knife before grinding. After being processed through the grinding machine, the wet dough is cut into long, thin strips approximately 50 cm in length. The wet crackers is then placed in racks while still sticky and allowed to sit for about 5 hours to help firm up its texture and decrease moisture content, which makes it less sticky and prevents breakage during separation. Lastly, the wet crackers are sun-dried (3c).

Introduction of the basic concept of GMP and identification of the possible application of GMP in the SMEs

The community engagement initiative focuses on introducing the fundamental concept of Good Manufacturing Practices (GMP) to the small and medium-sized enterprises (SMEs) in Slondok Puyur. The presentation began by informing the SMEs about the definition of GMP and the importance of implementing it in food production processes. It was explained that Good Manufacturing Practices (GMP) refer to a set of guidelines designed to ensure that products, such as food, are regularly produced and managed according to quality standards (Aminuddin & Purnomo, 2021; Daputra et al., 2022). These practices are essential for preventing contamination, adulteration, and mislabeling, thereby ensuring consumer safety and adherence to regulations.

Figure 4. The introduction of the basic concept of GMP and identification of the possible application of GMP in the SMEs

On the exposure and introduction of the basic concept of GMP, the community engagement team describe that GMP encompasses several aspects of manufacturing, including (i) quality management, (ii) sanitation and hygiene, (iii) personnel training, (iv) documentation and record keeping, and (v) inspection and audits. The quality management component aims to make certain that products adhere to safety and effectiveness standards. The community engagement team describe that quality management plays a crucial role in the development of small and medium-sized enterprises (SMEs). The implementation of quality management could influence their competitiveness, efficiency, and long-term sustainability (Anifowose & Ghasemi, 2022). On the presentation section, the community engagement team also describes that sanitation and hygiene involve maintaining cleanliness of facilities and equipment. The personnel training aspect focuses on educating staff about proper procedures, while documentation and record keeping provide a means for traceability. The final aspect of GMP is inspection and auditing, which is designed to ensure compliance.

Implementing Good Manufacturing Practices (GMP) in small and medium-sized enterprises (SMEs) can be straightforward with a few key steps of: (i) basic hygiene and sanitation, (ii) standard operating procedures, (iii) raw material quality control, (iv) equipment maintenance, (v) employee training, (vi) record keeping, and (vii) pest control. The possible application of GMP on SMEs of slondok puyur is tabulated on Table 1.

Table 1. The possible application of GMP on SMEs of Slondok Puyur

Aspect	Implementation	Possible target of the production steps
Basic hygiene and sanitation	- ensure cleanliness in production areas	Peeling, washing, grating, pressing, steaming, grinding, drying, cutting, packaging
	- proper handwashing	Peeling, grating, steaming, grinding, packaging
	- protective clothing ulitization	Grating, steaming, grinding, packaging
Standard operating procedures	- clear, simple guidelines development for each production step	pressing, steaming, drying
Raw material quality control	- high-quality raw material sourcing	Peeling
Equipment maintenance	- regular cleaning and inspection of the machinery	Grating, pressing, grinding, cutting
Employee training	- staff education on GMP principles	Peeling, washing, grating, pressing, steaming, grinding, drying, cutting, packaging
Record keeping	- maintain logs for production, sanitation, and quality checks to track compliance	Peeling, packaging
Pest control	- prevention of pest to compromise food safety	Air drying of the cassava dough, packaging

The community engagement team presents an example of how GMP can be integrated into the Slondok Puyur production process (Figure 4). For instance, regarding basic hygiene and sanitation, small and medium enterprises (SMEs) need to maintain cleanliness throughout all stages of production. During the discussion, the community engagement team encouraged SMEs to adopt Good Manufacturing Practices (GMP) in their operations, emphasizing its significance for the development of SMEs. The discussion section also provides an opportunity for the team to describe the benefits of the implementation of GMP in an SME. It was described that implementing GMP can improve quality assurance, ensure compliance with regulations, boost operational efficiency, reduce costs, enhance market competitiveness, and build greater trust and satisfaction among customers. By maintaining products that meet uniform quality standards, GMP helps to decrease defects and customer complaints. Adhering to GMP allows SMEs to meet industry standards, thus avoiding potential legal problems and fines. Streamlining operations results in reduced waste, better resource utilization, and enhanced productivity. Producing high-quality products improves brand reputation, enabling SMEs to compete more effectively in both local and global markets. Reliable products increase consumer trust, leading to repeat purchases and favorable referrals.

Conclusion

The community engagement success in inform the SMEs regarding the definition, aspect, and steps of the implementation of GMP as well as the role of GMP in

development of SMEs. The community engagement activity also able to identify the possible application of GMP in the production steps of the cassava-based crackers in SMEs of Slondok Puyur. The community engagement also able to give insight the SMEs related to the benefits of the implementation of GMP in the Small Medium Enterprises.

References

Aminuddin, R. A., & Purnomo, H. (2021). Identification and Risk Control of the Haccp System Implementation in the Pasteurized Crab Production Process. *Journal of Vocational Health Studies*, *5*(2), 94. https://doi.org/10.20473/jvhs.v5.i2.2021.94-99

Anifowose, O. N., & Ghasemi, M. (2022). *Sustainability-14-08719-V3.Pdf*.

Badan Pangan Nasional. (2022). Peta Ketahanan dan Kerentanan Pangan. *Badan Pangan Nasional*, 25–27.

Daputra, A., Wahyudi, T., & Uslianti, S. (2022). Penerapan Good Manufacturing Practice Dan Work Improvement in Small Enterprise Pada Usaha Kecil Kesehatan. *Jurnal Teknik Industri*, *4*(2), 23–29.

Darmanto, D., Mauludin, M. S., Kurniasari, L., & Hartati, I. (2019). Diseminasi Alat-Alat Proses Produksi Pada Usaha Produksi Slondok Puyur Di Sumurarum Kecamatan Grabag Kabupaten Magelang. *Abdimas Unwahas*, *4*(1), 61–68. https://doi.org/10.31942/abd.v4i1.2697

Hardi, K., & Puspitowati, I. (2022). Success Factors of Small and Medium-sized Enterprises in Jakarta. *Proceedings of the 3rd Tarumanagara International Conference on the Applications of Social Sciences and Humanities (TICASH 2021)*, *655*(Ticash 2021), 1070–1075. https://doi.org/10.2991/assehr.k.220404.169

Nugroho, W. A., Sucipto, & Saparianti, E. (2016). Introduction Of Good Manufacturing Practices (Gmp) And Mechanical Equipment To Improve Production Process Of Sme Rotterdam Bakery. *Journal of Innovation and Applied Technology*, *2012*, 1–23.

Priangkoso, T., Darmanto, D., Astuti, E. B., Kurniasari, L., & Hartati, I. (2020). Analisa Swot Pada Usaha Produksi Slondok Puyur Di Sumurarum Kecamatan Grabag Kabupaten Magelang. *Abdimas Unwahas*, *5*(1), 1–7. https://doi.org/10.31942/abd.v5i1.3328

Soekirman, M., & Suryani, F. A. (2020). Efforts to Increase Marketing Performance of Small and Medium Enterprises in Central Java, Indonesia. *INOBIS: Jurnal Inovasi Bisnis Dan Manajemen Indonesia*, *4*(1), 11–19. https://doi.org/10.31842/jurnalinobis.v4i1.162

Tambunan, T. (2022). Recent Development of Micro, Small and Medium Enterprises in Indonesia. *International Journal of Social Sciences and Management Review*, *06*(01), 193–214. https://doi.org/10.37602/ijssmr.2022.6112