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Analysis of The Application of Good Manufacturing Practice (GMP) in The Production Process of Butterfly Pea Flower Syrup (*Clitoria Ternatea L.*) at UMKM Bu Karno, Jember Regency

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ABSTRACT

The implementation of the Good Manufacturing Practice (GMP) program is a key effort by the company to ensure a safe food system for consumers. This research aims to identify and analyze the aspects of GMP implementation at UMKM Bu Karno, following the standards set by the Regulation of the Minister of Industry of the Republic of Indonesia Number 75 of 2010. Additionally, it provides recommendations for improvements to meet GMP requirements and enhance the effectiveness of its implementation. The research employs a qualitative descriptive method. The population consists of UMKM Bu Karno, with samples taken from business owners and experts in relevant fields. Data identification and analysis were conducted through questionnaires filled out using a checklist, with data analyzed using Gap Analysis for each aspect of GMP implementation. The processed data revealed an average total percentage of 70.06%, indicating that the GMP program at UMKM Bu Karno requires further improvement to fulfill GMP standards and enhance its effectiveness. The company should also consider the provided improvement recommendations to elevate the quality of GMP program implementation.

Keywords — GMP, Pea Flower Syrup, UMKM Bu Karno

1. Introduction

The advancement of technology and knowledge in the food sector encourages the food industry to creatively produce innovative food products that are accepted by the public. GMP is not a newly recognized quality system in Indonesia, as it has been published by the Ministry of Health of the Republic of Indonesia since 1987 through the Decree of the Minister of Health of the Republic of Indonesia Number 23/MEN.KES/SK/I/1987 dated January 24, 1978, as Guidelines for Good Production Practices for Food (Thaheer, 2005). Butterfly pea flower (Clitoria ternatea L.) is a plant from the legume family that grows as a vine, characterized by its blue-purple flowers resembling butterflies. Various innovative products can be derived from butterfly pea flowers, including natural food coloring, ready-to-drink beverages, jams, teas, and syrups. The antioxidants found in butterfly pea flowers can prevent oxidation in the human body and boost the immune system of those who consume it (Purba, 2020). Products made from butterfly pea flowers also have promising prospects for the development of the food industry.

This positive outlook for the food industry inspires the idea to explore the development of SMEs processing butterfly pea into innovative products. UMKM Bu Karno produces processed butterfly pea products, taking advantage of the abundant cultivation of butterfly pea, which has led to various innovations, including the creation of butterfly pea syrup. The production process of butterfly pea syrup at UMKM Bu Karno is conducted conventionally and still relies on simple production equipment. Conventional

production is carried out due to the limited production capacity, which does not necessitate sophisticated modern equipment. The production process has also not fully implemented GMP programs, making the butterfly pea syrup susceptible to contamination.

Contamination in the product can result from production activities that do not adhere to established procedures, as well as insufficient supervision during the production process. Factors affecting the production include environmental conditions. The inadequate implementation of GMP has caused several issues at UMKM Bu Karno. Contaminated butterfly pea syrup can lead to a decline in quality, even resulting in chemical changes. The suboptimal application of GMP and the production process not being aligned with producing quality products indicate discrepancies in the production process, which could pose a food safety threat. The analysis of Good Manufacturing Practice (GMP) identifies and analyzes gaps in implementation aspects and provides improvement recommendations related to the gaps in the application of Good Manufacturing Practice (GMP) at UMKM Bu Karno.

2. Method

This research uses a descriptive qualitative approach and expert system. According to Sugiyono (2017), the qualitative descriptive research method seeks to explore and describe the social situation under study thoroughly, broadly, and in-depth. According to Marimin (2007), the expert system method involves research conducted using an analytical approach for a specific problem and decision-making by interviewing experts relevant to the required field. The determination of experts includes several classifications (Marimin, 2007). This analysis uses a population centered on UMKM Bu Karno. The sampling method chosen is purposive sampling, focusing on the owner, employees, and experts who are considered to have the best understanding of the butterfly pea syrup production process.

The research variables used in this analysis include the classification of variables for the implementation of Good Manufacturing Practices (GMP), covering location, building, facilities and sanitation, machines and equipment, materials, production process supervision, final products, laboratories, employees, packaging, labeling and product information, storage, maintenance and sanitation programs, transportation, documentation and recording, training, product recalls, and guideline implementation. The instruments in this research consist of observations, interviews, documentation, checklist assessments, and closed questionnaires. The study was conducted at UMKM Bu Karno, located at Jl. Nusa Indah Gang 5a No. 35, Kelurahan Jember Lor, Kecamatan Patrang, Kabupaten Jember.

The data collection techniques used are secondary and primary data. The data analysis technique employed is Gap Analysis, a method or tool for an institution or company to compare actual performance with potential or expected performance, to identify the gap between actual conditions and certain standards or expectations (Admaja, 2013). The scoring weight determination for assessing GMP aspects is as follows (Bakhtiar and Purwanggono, 2009):

a. Score 1: If the organization or company does not engage in that activity.
b. Score 2: If the organization or company understands that the activity is good to do but does not yet perform it or has not fulfilled certain activity requirements.
c. Score 3: If the organization or company sometimes engages in that activity (not yet consistent).
d. Score 4: If the organization or company engages in that activity but not perfectly/not maximally.
e. Score 5: If the organization or company engages in that activity well.

The percentage calculation for the implementation based on the sum of weights is as follows:

$$\% \text{ Penerapan} = \frac{Total\ Skor\ Tiap\ Parameter}{Total\ Skor\ Maksimal}\ x\ 100\%$$

The following is a table for the overall assessment of GMP quality according to BPOM RI in 2012:

No	Tingkat	Jumlah Penyimpangan			
		Minor (MI)	Mayor (MA)	Seriu s (SE)	Kritis (KR)
1	Level 1	1	1	0	0
2	Level 2	1	2-3	0	0
3	Level 3	NA	>= 4	1-4	0
4	Level 4	NA	NA	>=5	>= 1

Level 1 means that if there are nonconformities or deviations that potentially affect quality and nonconformities that affect the efficiency of food safety control, with a total not exceeding 1, it is possible to obtain a Food Industry Home Production Certificate (SPP-IRT). Level 2 means that if there are nonconformities affecting the efficiency of food safety control or major category deviations of 2-3, the business is classified as level 2 and can also obtain a Food Industry Home Production Certificate (SPP-IRT). Level 3 means that if there are nonconformities that potentially affect food safety or serious category deviations of ≥5. Level 4 means that if there are nonconformities that will affect food safety or critical category deviations of ≥1.

3. Discussion

Good Manufacturing Practice (GMP) consists of 18 aspects that serve as guidelines. The results of the analysis of the implementation of GMP aspects at UMKM Bu Karno showed an overall average score of 66.30%. This score indicates that the implementation program of GMP in the production of butterfly pea syrup at UMKM Bu Karno still needs improvement to meet GMP requirements and enhance the effectiveness of GMP implementation in accordance with the Regulation of the Minister of Industry of the Republic of Indonesia Number 75 of 2010. Based on the research conducted, several gaps were found in the parameters of each GMP aspect.

No	GMP Aspect	Parameters	Total Score for Each Parameter	Maximum Total Score	Percentage (%)
1.	Location	7	26	35	74,28
2.	Building	11	33	55	60
3.	Sanitation Facilitation	19	68	95	71,57
4.	Machinery and Equipment	13	41	65	63,07
5.	Materials	9	38	45	84,44
6.	Process Supervision	20	61	100	61
7.	Final Product	4	15	20	75
8.	Laboratory	3	9	15	60
9.	Employees	8	24	40	60
10.	Packaging	8	34	40	85
11.	Product Label and Information	3	15	15	100
12.	Storage	14	42	70	60
13.	Maintenance and Sanitation Program	27	73	135	54,07
14.	Transportasi	8	26	40	65
15.	Documentation and Record Keeping	3	6	15	40
16.	Training	6	18	30	60
17.	Product Recall	6	20	30	66,66
18.	Implementation of Guidelines	3	8	15	53,33
	RATA-RATA SKOR PENERAPAN KESELURUHAN				**66,30**

Based on the analysis of the application of GMP in Table 4.1, it is known that the highest percentage of GMP aspect application is in the implementation of labeling and product information aspects at 100%, meaning that the labeling and product information aspects at UMKM Bu Karno have met the GMP standard requirements according to the Regulation of the Minister of Industry of the Republic of Indonesia Number 75 of 2010. Meanwhile, the lowest percentage of GMP aspect application is in the implementation of documentation and record-keeping aspects at 40%, which means that the implementation of documentation and record-keeping aspects in UMKM Bu Karno still needs improvement to meet the GMP standard requirements and enhance the effectiveness of the GMP program implementation. The GMP application aspects that received a Level 1 category with a percentage of 75%-100% are 4 aspects. The aspects that received a Level 2 category with a percentage of 50%-74% are 13 aspects. The GMP application aspect that received a Level 3 category with a percentage of 1%-49% is 1 aspect.

Discussion and explanation of each aspect of GMP application at UMKM Bu Karno are as follows:

a. Location

Building parameters that receive scores of 2 and 3 are expected to be improved to meet the GMP application standards. Parameters that receive a score of 4 can be maintained or raised to continue meeting GMP application standards.

b. Sanitation Facilities

The importance of reminder facilities or instructions for employees while working to maintain hygiene is essential. Parameters that score 2 should always be improved to meet the GMP implementation standards in accordance with applicable regulations.

c. Machinery and Equipment

Parameters with scores of 2 and 3 require improvements to meet the GMP application standards. The layout of machines or equipment can be arranged in such a way that they are accessible, maintainable, and easy to clean. Regular monitoring, inspection, and oversight of production machinery or equipment should be conducted. The accuracy of measuring instruments used in production must be ensured.

d. Materials

The percentage assessment has met the average score standards, so the company only needs to maintain and consistently monitor the materials used in production.

e. Process Supervision

The total score for the supervision aspect has not yet reached the GMP implementation standards according to regulations. Improvements in the supervision aspect are necessary for enhancing the production process, particularly for parameters that scored 1, 2, and 3, which require significant improvements.

f. Final Product

The assessment results have met the GMP application standards, and there is still room for improvement. Enhancing the assessment score can be achieved by creating detailed and official specifications for the final product, ensuring that the SME has a basis for high-quality and consistent products. Testing of the products produced after the production process is essential. Providing guarantees for the food products produced based on the testing that has been conducted.

g. Laboratory

The application in the laboratory aspect received a total score that has not met the GMP implementation standards, so improvements are still needed in this area. The score for application can be improved through better implementation of GMP practices in the business.

h. Employees

The total score obtained in the employee aspect has not yet met the GMP implementation standards, so improvements are necessary in this area to support proper GMP implementation.

i. Packaging

The packaging aspect has met the GMP implementation standards relevant to the business. The SME is expected to maintain consistency in packaging to prevent product contamination.

j. Product Labels and Information

The parameters for product labels and information in GMP implementation have met the requirements according to regulations. The business owner is expected to maintain consistency in this aspect so that consumers can easily access information about the product's contents.

k. Storage

The parameters for GMP implementation in storage still do not meet the applicable GMP standards. Improvements in the storage aspect are essential to support proper GMP implementation.

l. Maintenance and Sanitation Program

Maintenance and sanitation programs are still far from meeting the requirements for GMP implementation in the business, necessitating improvements and enhancements in the quality of the parameters related to GMP application.

m. Transportation

The transportation aspect has not met the GMP implementation standards according to regulations.

n. Documentation and Record Keeping

The documentation and record-keeping aspect is the only one that received a score below 50%, indicating that it is far from meeting the applicable GMP implementation standards.

o. Training

The training aspect needs improvement as it still does not meet the relevant GMP implementation standards.

p. Product Recall

The product recall procedure has not been officially established; recalls are only conducted when there are reports from consumers. Products in the hands of consumers are only advised against consumption until they have passed their expiration date.

q. Implementation of Guedelines

The implementation of guidelines in GMP application is crucial as a benchmark for whether the business has fully adhered to GMP standards. The implementation aspect of GMP guidelines in this business has not received a total score that meets the GMP standards.

4. Conclusion

The level of gap in the implementation of GMP at UMKM Bu Karno received an average overall score of 66.30%. This percentage indicates that the application of GMP still needs improvement to meet GMP requirements and enhance the effectiveness of the GMP program. Aspects that directly impact the production process include machinery and equipment, process supervision, employees, storage, maintenance, and sanitation programs, all of which can lead to product contamination during production. These GMP implementation aspects require more attention and corrective actions from the business owner to improve the quality and safety of food.

Improvements in the implementation of GMP are necessary for the company to meet GMP requirements and enhance food safety. Recommendations for improvements include changes to the production area layout, repairs to wall corners, adding doors to rooms with curtains, installing nets on ventilation or adding exhaust systems, creating production requirement formulations, developing work instructions, utilizing private or government laboratories, procuring complete personal protective equipment (PPE) as needed for production, establishing storage management, implementing sanitation programs that meet standards, maintaining comprehensive and structured documentation, and creating procedures for recalling hazardous products from the market.

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